



Final

## Kilbourne Subdivision Lands

### Environmental Impact Study

**Prepared for:**

Kilbourne Developments and Westgate Developments  
(London) Incl.  
c/o York Developments  
303 Richmond Street, Suite 201  
London, ON N6B 2H8

**Prepared by:**

Dan Riley  
Terrestrial and Wetland Biologist  
Natural Resource Solutions Inc.  
415 Phillip Street, Unit C  
Waterloo, ON  
N2L 3X2

To be submitted to the City of London –  
Community Planning, Housing and Community Growth

Project No. 2245A | April 2026



**NATURAL RESOURCE SOLUTIONS INC.**

Aquatic, Terrestrial and Wetland Biologists

## **Executive Summary**

Natural Resource Solutions Inc. (NRSI) was retained in April 2019 by Kilbourne Developments and Westgate Developments (London) Inc., care of York Developments to complete an Environmental Impact Study (EIS) for a proposed development in the southwest of London, Ontario. The proposed development includes a mixture of low, low to medium, medium, and medium to high residential density blocks. It also includes convenience commercial / medium density blocks, park and open space blocks, stormwater management blocks and the associated roads, road widening and walkways.

The subject lands are approximately 85ha in size. The lands currently consist of annual row crop fields, a woodland in the northwest, and the Thornicroft Drain and associated riparian habitat that crosses the property in a north-south direction (Map 1). A golf range and industrial lands are present in the southern portion of the subject lands as well as an abandoned residential site that fronts onto Bostwick Road. The subject lands are located within the Dingman Creek subwatershed and are within Ecoregion 7E.

Natural heritage information was collected and reviewed to identify key natural heritage features, habitats and species that are reported from, or have the potential to occur within the study area. A comprehensive suite of terrestrial and aquatic surveys were conducted to characterize the subject lands, which included but were not limited to Ecological Land Classification (ELC), a three-season vegetation inventory, woodland and wetland boundary delineations, snake coverboard surveys, turtle basking and nesting surveys, anuran call surveys, breeding and migratory bird surveys, insect surveys, aquatic habitat assessment, benthic invertebrate surveys, headwater drainage feature (HDF) assessments, and fish community surveys.

Several significant and sensitive natural features are present within the subject lands. Several small wetlands are present, which are not considered provincially significant; however, two swamp communities associated the most northern woodland are considered sensitive to development. A large woodland in the north of the subject lands, as well as woodlands along the Thornicroft Drain have been identified as significant in accordance with the London Plan. A Cultural Savannah community within the subject lands meets the City's definition of significance, but has been considered to not be significant based on the definition of woodland provided in the Provincial Policy Statement (PPS) (2020), ELC manual (Lee et al. 1998), and the Forestry

Act (1990). Significant Valleylands are present along the Thornicroft Drain and have been identified at an extent of 30m on either side of the watercourse. The Thornicroft Drain also provides direct fish habitat and is an important movement corridor for wildlife across the local landscape. Numerous HDFs were identified from the subject lands, with several being identified with a management recommendation of Conservation or Protection.

Habitat for a single Butternut tree was identified from the subject lands and woodlands within the subject lands have been considered to provide candidate habitat for Protected Species bats. Significant Wildlife Habitat (SWH) has been confirmed for a rare vegetation community (FOD7-4), terrestrial crayfish, and Eastern Wood-Pewee. Candidate SWH has been identified for Bat Maternity Colonies and Reptile Hibernacula. Additionally, regionally significant vascular plant species have been identified from vegetation communities within the subject lands.

Comprehensive buffers have been identified for significant and sensitive natural features within the subject lands. A 30m buffer has been identified on either side of the Thornicroft Drain to provide a corridor that is over 60m in width. Additional areas of buffer exceedance have been identified along the corridor where the proposed development limit is located beyond the recommended buffer widths. Several small vegetation communities and portions of vegetation communities are proposed for removal from the subject lands in support of the proposed development. The removal of treed vegetation communities will be compensated for within the identified areas of buffer exceedance and restoration plantings will be provided in buffer areas to provide a robust corridor along the Thornicroft Drain. A small MAM2-2 community is proposed for removal from the subject lands, which will be compensated for at a ratio of 1:1 within the subject lands.

An assessment of potential impacts resulting from the proposed development has been completed as part of this study. No significant negative impacts are anticipated as long as recommended mitigation, compensation and restoration measures are implemented. A net positive effect will be provided for the Thornicroft Drain corridor through the widening of the corridor to a width  $\geq 60\text{m}$  along the length of the watercourse that flows through the subject lands. Through the addition of planted buffer areas and additional buffer exceedance areas, these improvements will result in a more robust and higher quality corridor.

At this stage of the proposed project, the intent and requirements of all environmental policies of the City of London Plan, the PPS, and other relevant legislation have been met.

Recommendations are provided within this report for the focused design stage of the development to ensure that all relevant policies and regulations continue to be met, which include, but are not limited to:

- Adherence to phasing of the proposed works in accordance with the recommendations identified in the Functional Planning Report (FPR) (MHBC 2024).
- Development of a comprehensive Grading Plan for the proposed development.
- Development of a Tree Inventory and Preservation Plan (TIPP) to address tree removals and compensation requirements for the proposed development.
- Development of a detailed Stormwater Management (SWM) Plan.
- Development of a Restoration Plan to include a planting plan for the buffer areas and buffer exceedance areas within the subject lands.
- Development of a wetland construction plan addressing hydrologic requirements for the wetland and proposed low flow channel, as well as a planting plan for the wetland.
- Development of an Environmental Monitoring Plan (EMP) to identify monitoring requirements during and post-construction.
- Development of a detailed Erosion and Sediment Control (ESC) Plan by a qualified engineer.

This EIS was submitted to York Developments on October 23, 2024. Comments were received from the City of London on November 5, 2025. These comments have been addressed through a revision of the EIS and relevant comment responses have been appended.

## Kilbourne Subdivision Lands

### Environmental Impact Study

#### Project Team

|                   |                                                    |
|-------------------|----------------------------------------------------|
| Dan Riley         | Terrestrial and Wetland Biologist, Project Manager |
| Katharina Richter | Senior Biologist, Project Advisor                  |
| Pat Deacon        | Terrestrial and Wetland Biologist                  |
| Blair Baldwin     | Aquatic Biologist                                  |
| Sam Catry         | Aquatic Biologist                                  |
| Kaitlin Filippov  | GIS Analyst                                        |

Report submitted on October 23, 2024

Revised for resubmission on April 24, 2026



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Dan Riley  
Terrestrial and Wetland Biologist  
Project Manager



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Katharina Richter  
Senior Biologist  
Project Advisor

## Table of Contents

|            |                                                            |           |
|------------|------------------------------------------------------------|-----------|
| <b>1.0</b> | <b>Introduction .....</b>                                  | <b>1</b>  |
| 1.1        | Policy Context.....                                        | 3         |
| 1.2        | Project Scope.....                                         | 11        |
| <b>2.0</b> | <b>Physical Environment .....</b>                          | <b>14</b> |
| 2.1        | Soil, Terrain, and Drainage.....                           | 14        |
| 2.2        | Hydrogeology.....                                          | 15        |
| 2.3        | Designated Natural Areas .....                             | 16        |
| <b>3.0</b> | <b>Natural Environment – Background Information .....</b>  | <b>17</b> |
| 3.1        | Collection and Review of Background Information.....       | 17        |
| 3.2        | Significant Species and Habitat Screening.....             | 18        |
| 3.3        | Field Methods.....                                         | 20        |
| 3.4        | Terrestrial Habitat and Species .....                      | 27        |
| 3.4.1      | Vegetation Surveys.....                                    | 27        |
| 3.4.2      | Woodland Dripline Delineation.....                         | 27        |
| 3.4.3      | Wetland Delineation.....                                   | 27        |
| 3.4.4      | Bird Surveys .....                                         | 27        |
| 3.4.5      | Herpetofauna Surveys .....                                 | 28        |
| 3.4.6      | Significant Species and Habitat Assessments .....          | 29        |
| 3.4.7      | Bat Habitat Assessment.....                                | 30        |
| 3.4.8      | Lepidoptera and Odonata .....                              | 30        |
| 3.4.9      | General Wildlife .....                                     | 30        |
| <b>3.5</b> | <b>Aquatic Habitat and Species.....</b>                    | <b>30</b> |
| 3.5.1      | Headwater Drainage Feature Assessment.....                 | 30        |
| 3.5.2      | Aquatic Habitat Assessment and Temperature Monitoring..... | 31        |
| 3.5.3      | Benthic Invertebrate Sampling .....                        | 32        |
| 3.5.4      | Fish Community Sampling .....                              | 32        |
| <b>4.0</b> | <b>Natural Environment - Results and Discussion .....</b>  | <b>34</b> |
| <b>4.1</b> | <b>Terrestrial Species and Habitat .....</b>               | <b>34</b> |
| 4.1.1      | Vegetation Communities.....                                | 34        |
| 4.1.2      | Vascular Flora .....                                       | 37        |
| 4.1.3      | Birds .....                                                | 38        |
| 4.1.4      | Herpetofauna.....                                          | 41        |
| 4.1.5      | Mammals .....                                              | 43        |

|             |                                                                              |           |
|-------------|------------------------------------------------------------------------------|-----------|
| 4.1.6       | Lepidoptera and Odonata .....                                                | 44        |
| 4.1.7       | Additional Wildlife .....                                                    | 45        |
| <b>4.2</b>  | <b>Aquatic Resources .....</b>                                               | <b>46</b> |
| 4.2.1       | Headwater Drainage Feature Assessment.....                                   | 46        |
| 4.2.2       | Benthic Invertebrate Sampling .....                                          | 63        |
| 4.2.3       | Aquatic Habitat Assessment and Temperature Monitoring.....                   | 66        |
| 4.2.4       | Fish Community Sampling .....                                                | 69        |
| <b>5.0</b>  | <b>Evaluation of Significance .....</b>                                      | <b>71</b> |
| <b>5.1</b>  | <b>Wetlands.....</b>                                                         | <b>71</b> |
| <b>5.2</b>  | <b>Significant Woodlands .....</b>                                           | <b>73</b> |
| <b>5.3</b>  | <b>Significant Valleyland.....</b>                                           | <b>76</b> |
| <b>5.4</b>  | <b>Significant Wildlife Habitat.....</b>                                     | <b>76</b> |
| 5.4.1       | Seasonal Concentration Areas .....                                           | 77        |
| 5.4.2       | Rare Vegetation Communities (Confirmed).....                                 | 78        |
| 5.4.3       | Specialized Wildlife Habitat.....                                            | 78        |
| 5.4.4       | Habitat for Species of Conservation Concern .....                            | 78        |
| 5.4.5       | Animal Movement Corridors.....                                               | 79        |
| <b>5.5</b>  | <b>Habitat of Endangered and Threatened Species .....</b>                    | <b>79</b> |
| 5.5.1       | Butternut.....                                                               | 79        |
| 5.5.2       | Protected Species Bats.....                                                  | 81        |
| <b>5.6</b>  | <b>Fish Habitat .....</b>                                                    | <b>82</b> |
| <b>5.7</b>  | <b>Other Drainage Features .....</b>                                         | <b>82</b> |
| <b>5.8</b>  | <b>Corridors and Linkages.....</b>                                           | <b>83</b> |
| <b>5.9</b>  | <b>Potential Naturalization Areas .....</b>                                  | <b>83</b> |
| <b>5.10</b> | <b>Summary of Natural Feature Constraints .....</b>                          | <b>85</b> |
| <b>6.0</b>  | <b>Ecological Buffers .....</b>                                              | <b>88</b> |
| <b>7.0</b>  | <b>Impact Analysis and Recommendations .....</b>                             | <b>90</b> |
| <b>7.1</b>  | <b>Proposed Development.....</b>                                             | <b>90</b> |
| 7.1.1       | Stormwater Management.....                                                   | 92        |
| 7.1.2       | Water Balance .....                                                          | 93        |
| <b>7.2</b>  | <b>Buffer Analysis .....</b>                                                 | <b>94</b> |
| <b>7.3</b>  | <b>Natural Feature Encroachment and Compensation .....</b>                   | <b>96</b> |
| 7.3.1       | Cultural Plantation Removal and Compensation .....                           | 97        |
| 7.3.2       | Woodland Compensation for 3080 Bostwick EIS .....                            | 97        |
| 7.3.3       | Woodland Compensation for 3563 Bostwick Road, Westwinds Subdivision EIS..... | 98        |

|             |                                                                                             |            |
|-------------|---------------------------------------------------------------------------------------------|------------|
| 7.3.4       | Woodland Removal for Kilbourne Road (Hayward Parkway) Crossing and Pedestrian Walkway ..... | 98         |
| 7.3.5       | Woodland Removal for Pedestrian Walkway .....                                               | 99         |
| 7.3.6       | Woodland Removal for Block 87 SWM Pond .....                                                | 99         |
| 7.3.7       | Wetland/Pond Removals and Compensation .....                                                | 100        |
| 7.3.8       | Cultural Savannah Encroachment and HDF Impacts .....                                        | 101        |
| <b>7.4</b>  | <b>Impact &amp; Net Effects Assessment .....</b>                                            | <b>102</b> |
| 7.4.1       | Evaluations of the Potential Effects, Mitigation and Net Effects.....                       | 103        |
| <b>8.0</b>  | <b>Environmental Management Recommendations .....</b>                                       | <b>119</b> |
| 8.1         | Planning and Design Stage.....                                                              | 119        |
| 8.2         | Construction Stage.....                                                                     | 120        |
| 8.3         | Post-Construction Stage .....                                                               | 122        |
| <b>9.0</b>  | <b>Summary.....</b>                                                                         | <b>123</b> |
| <b>10.0</b> | <b>References.....</b>                                                                      | <b>125</b> |

## List of Tables

|           |                                                                                |     |
|-----------|--------------------------------------------------------------------------------|-----|
| Table 1.  | Relevant Policies & Legislation.....                                           | 4   |
| Table 2.  | Scoping and Project Meetings .....                                             | 11  |
| Table 3.  | Field Survey Summary .....                                                     | 21  |
| Table 4.  | Vegetation Communities within the Study Area .....                             | 34  |
| Table 5.  | Significant Vascular Flora Observed in the Study Area .....                    | 38  |
| Table 6.  | Anuran Call Survey Results.....                                                | 41  |
| Table 7.  | Headwater Drainage Feature Existing Conditions and Management Evaluation ..... | 47  |
| Table 8.  | 2019 Qualitative Benthic Macro-Invertebrate Metrics .....                      | 64  |
| Table 9.  | 2019 Quantitative Benthic Macro-Invertebrate Metrics .....                     | 64  |
| Table 10. | Summary of Natural Feature Constraints .....                                   | 85  |
| Table 11. | Buffers.....                                                                   | 89  |
| Table 12. | Buffer Analysis .....                                                          | 95  |
| Table 13. | Impact Assessment, Mitigation, and Net Effects .....                           | 104 |

## List of Figures

|                                                                             |    |
|-----------------------------------------------------------------------------|----|
| Figure 1. 2019 Surface Water Temperature Monitoring Thornicroft Drain ..... | 67 |
| Figure 2. WTM-002 Thermal Regime Monitoring.....                            | 68 |
| Figure 3. WTM-003 Thermal Regime Monitoring.....                            | 68 |
| Figure 4. WTM-004 Thermal Regime Monitoring.....                            | 69 |

## Maps

|                                                           |  |
|-----------------------------------------------------------|--|
| Map 1. Study Area and Land Use                            |  |
| Map 2. Study Area and Natural Heritage                    |  |
| Map 3. ELC and Groundwater Indicator Species Observations |  |
| Map 4. Terrestrial Monitoring Locations                   |  |
| Map 5. Aquatic Monitoring Locations                       |  |
| Map 6. Aquatic Monitoring Locations                       |  |
| Map 7. Significant Natural Features                       |  |
| Map 8. Buffers and Development Concept                    |  |

## List of Appendices

|                                                                                 |  |
|---------------------------------------------------------------------------------|--|
| Appendix I Comment Response Table                                               |  |
| Appendix II Issues Summary Checklist and Agency Approval                        |  |
| Appendix III Species at Risk and Species of Conservation Concern Screening      |  |
| Appendix IV Significant Wildlife Habitat Screening Tables                       |  |
| Appendix V Ecological Land Classification Field Forms                           |  |
| Appendix VI_Vascular Plant Species Observed from the Subject Lands              |  |
| Appendix VII Bird Species Reported from the Study Area                          |  |
| Appendix VIII_Herpetofauna Species Reported from the Study Area                 |  |
| Appendix IX_Mammal Species Reported from the Study Area                         |  |
| Appendix X Management Guidelines for Headwater Drainage Features                |  |
| Appendix XI Photo Appendix of Headwater Drainage Features on Subject Lands      |  |
| Appendix XII Significant Woodland Evaluation Forms                              |  |
| Appendix XIII Proposed Draft Plan of Subdivision – Kilbourne and Westgate Lands |  |

## 1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained in April 2019 by Kilbourne Developments and Westgate Developments (London) Inc., care of York Developments to complete an Environmental Impact Study (EIS) for a proposed development in the southwest of London, Ontario.

A Subject Lands Status Report (SLSR), which included background species information for the subject lands, as well the results of original field surveys, and identification of sensitive and significant features of the study area, was prepared and submitted to the City of London as part of the scoping process on January 20, 2022 (NRSI 2021). The information within the SLSR, as well through discussions with the City of London were used to inform the Draft Plan. A separate EIS relating to the Bostwick – Block 7, 8 and 9 lands to the north of the subject lands has been prepared by NRSI and has been submitted under a separate cover (NRSI 2026a).

This EIS report was submitted to York Developments on October 23, 2024. Comments on the EIS were provided by the City of London and Upper Thames River Conservation Authority (UTRCA) on November 5, 2025. These comments have been addressed through the preparation of this revised EIS report. A comment response table with responses to relevant comments from the City of London ecologist on file and UTRCA has been provided in Appendix I.

For the purposes of this report, the term “subject lands” refers to the area of interest owned by Kilbourne Developments and Westgate Developments that the studies were undertaken for in order to complete the development application. The term “study area” refers to the subject lands plus lands within approximately 1km of the area. Detailed biological surveys were undertaken by NRSI biologists on the subject lands. Legacy data collected from agencies encompassed the study area to ensure that all surrounding natural features were considered.

The subject lands, shown on Map 1, are approximately 85ha in area and are located north of the intersection of Wharncliffe Road South with Bostwick Road / Exeter Road. The subject lands border Bostwick Road to the west. The alignment for the proposed Bradley Avenue extension, which was subject to an Environmental Assessment, crosses the northern portion of the subject lands, which will eventually tie into Pack Road to the west. The lands consist of annual row crop fields, a woodland in the northwest, and the Thornicroft Drain and associated riparian habitat that crosses the property in a north-south direction. A golf driving range and

industrial lands are present in the southern portion of the subject lands as well as a former residential site that fronts onto Bostwick Road, but which no longer has any buildings present. That site is identified as an “Unevaluated Vegetation Patch” by the City of London.

The City of London’s Official Plan, referred to as the London Plan, mapping (2023; Map 1 - Place Types) identifies the subject lands as Neighbourhoods, Green Space, and a small section of Environmental Review (Map 1). The subject lands are located within Ecoregion 7E, and are within the Upper Thames River watershed, and the Dingman Creek subwatershed (City of London 2023). The London Plan mapping (2023; Map 5, Natural Heritage) shows Significant Valleyland associated with Thornicroft Drain, Significant Woodland associated with Patch 10064 and Thornicroft Drain. The London Plan mapping shows two unevaluated vegetation patches, these were assessed through the Bradley Avenue / Bostwick Road Environmental Assessment with the remaining section of Patch #10065 identified as not significant, while the unevaluated vegetation patch was assessed as Significant. A Valleyland is also shown on the London Plan mapping. These natural heritage features, as per the London Plan mapping are shown on Map 2 of this report. The wooded areas within the subject lands are located within the City of London Tree Protection Area.

Based on the London Plan (City of London 2023) and Ontario Regulation 41/24 Prohibited Activities, Exemptions, and Permits (Government of Ontario 2024), any development within or adjacent to the identified significant features outlined above requires the preparation of an EIS. As the SLSR had been developed in accordance with the City of London’s Environmental Management Guidelines (2021a) and the Subject Lands Status Report for Unevaluated Patches “Draft” Terms of Reference (City of London 2013), this EIS has utilized the SLSR information, but the report has been updated to be in accordance with the City of London Environmental Management Guidelines (2021a), which includes guidelines for the preparation of EISs.

This report contains the findings of the SLSR and EIS including the characterization of existing natural features based on the results of a background review, original field investigations, and discussions with agency staff. The characterization was used to inform an analysis of the significance and sensitivity of natural features, the identification of natural feature constraints in association with land use policy designations, and the assessment of potential impacts and mitigation measures associated with details of the proposed development.

## **1.1 Policy Context**

Natural features identified during background review and the detailed field investigations were evaluated against relevant policies and legislation to help inform suitable land-use concepts, guide the layout of development, and identify areas to be protected. Table 1 provides an overview of policies and the analysis of natural features within the subject lands.

**Table 1. Relevant Policies & Legislation**

| Policy/Legislation                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Project Relevance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Provincial Planning Statement (OMMAH 2024) | <ul style="list-style-type: none"> <li>• Issued under the authority of Section 3 of the Planning Act and came into effect on October 20, 2024, replacing the 2020 Provincial Policy Statement.</li> <li>• Section 4.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as significant.</li> <li>• The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000) and associated criteria schedules (MNRF 2015) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.</li> </ul> | <ul style="list-style-type: none"> <li>• Natural features that occur or may occur within the study area, and which receive protection under the PPS, include: <ul style="list-style-type: none"> <li>○ Significant Woodland,</li> <li>○ Significant Valleyland,</li> <li>○ Significant Wildlife Habitat,</li> <li>○ Fish Habitat, and</li> <li>○ Habitat for Endangered and Threatened species.</li> </ul> </li> <li>• Section 2.1.1 of the PPS states that natural features and areas shall be protected for the long term.</li> <li>• Section 2.1.2 of the PPS states that 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 groundwater features.</li> <li>• Section 2.1.5 of the PPS states that development or site alteration shall not be permitted in Significant Woodlands, Significant Valleylands, or Significant Wildlife Habitat unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions.</li> <li>• Section 2.1.6 of the PPS states that development or site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.</li> <li>• Section 2.1.7 of the PPS states that development or site alteration shall not be permitted in habitat of Endangered or Threatened species except in accordance with provincial or federal requirements.</li> <li>• Section 2.1.8 of the PPS states that development and site alteration shall not be permitted on adjacent lands to the natural features described above unless it is</li> </ul> |

| Policy/Legislation                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Project Relevance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | demonstrated that there will be no negative impacts to the natural features or their ecological functions.                                                                                                                                                                                                                                                                                                                                                                                                     |
| Species Conservation Act (SCA), 2026 | <ul style="list-style-type: none"> <li>The SCA and its regulations replaced the 2007 Endangered Species Act on March 30, 2026.</li> <li>This has resulted in a number of changes to how at-risk species are addressed in planning and development processes in Ontario.</li> <li>The SCA takes a "registration-first" approach for activities impacting at-risk species, though permits are still required for some activities.</li> <li>Protected species now listed on the Protected Species in Ontario List.</li> <li>Protections for species on the Protected Species in Ontario List are described as "Section 16 activities" and include killing, harming, capturing or taking of a member of a species or damage to or destruction of the habitat of a species.</li> </ul>                            | <ul style="list-style-type: none"> <li>Based on the screening and the detailed field surveys, one Protected Species is present within the subject lands: Butternut (<i>Juglans cinerea</i>).</li> <li>Several other Protected Species and/or their habitats were identified as having the potential to occur within the study area adjacent to the subject lands and within the subject lands based on presence of suitable habitat and/or structures.</li> </ul>                                              |
| Species at Risk Act (SARA), 2002     | <ul style="list-style-type: none"> <li>The SARA is federal legislation that protects species listed as Endangered, Threatened or Special Concern on Schedule 1 of the Act.</li> <li>SARA prohibits killing, harming, harassing, capturing, or taking of individuals.</li> <li>Under SARA, prohibitions regarding individuals and residences for migratory birds and aquatic SAR apply wherever they occur in Canada (including private lands).</li> <li>For terrestrial SAR, these prohibitions only apply on federal lands.</li> <li>In the case of a migratory bird species listed under the <i>Migratory Birds Convention Act</i>, certain SARA prohibitions protecting individuals and residences (e.g., nests or dens) of Endangered, Threatened and Extirpated species apply automatically.</li> </ul> | <ul style="list-style-type: none"> <li>Based on preliminary screening and previously conducted field surveys, there is some potential for federally regulated SAR to occur within the project study area.</li> <li>Federally listed birds and their residences need to be considered. Timing of construction activities, especially vegetation clearing and site grading must consider federally listed birds. If timing windows cannot be followed and nests observed, permitting may be required.</li> </ul> |

| Policy/Legislation            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Project Relevance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <ul style="list-style-type: none"> <li>In the case of aquatic SAR, SARA prohibitions protect individuals, residence (e.g., fish spawning areas, mussel beds or burrows) and identified critical habitat.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Canadian Fisheries Act (1985) | <ul style="list-style-type: none"> <li>Last amended in August 2019, the federal Fisheries Act provides for the protection of fish and fish habitat.</li> <li>Fish are protected through two core prohibitions: Section 34.4(1) prohibits the death of fish by means other than fishing, and Section 35(1) prohibits the harmful alteration, disruption, or destruction (HADD) of fish habitat (Government of Canada 2019).</li> <li>Fish habitat is defined as “spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes”.</li> </ul> | <ul style="list-style-type: none"> <li>Thornicroft Drain provides direct fish habitat.</li> <li>Headwater features within the subject lands were assessed for fish habitat.</li> <li>Crossings over the Thornicroft Drain will need to consider the Fisheries Act.</li> <li>Headwater features that provide fish habitat need to consider the Fisheries Act.</li> <li>Stormwater management (SWM) needs to consider the Thornicroft Drain (thermal regime, quality, quantity).</li> <li>The need for project review by the Department of Fisheries and Oceans (DFO) Fish and Fish Habitat Protection Program (FFHPP) will be determined upon the completion of a proponent-led assessment of whether the proposed undertaking can meet all measures to protect fish and fish habitat (as outlined in the DFO’s online Projects Near Water guidelines).</li> <li>Should that assessment indicate that impacts to fish and fish habitat may occur as a result of the proposed development, project review by the DFO will be necessary to determine if the proposed undertaking has the potential to contravene the Fisheries Act, and if an Authorization under the Act will be required.</li> </ul> |
| The London Plan (2026)        | <ul style="list-style-type: none"> <li>The London Plan was adopted by Council and approved by the Province of Ontario in 2016. It was most recently consolidated in January 2026.</li> <li>The London Plan (2026), outlines current policies for the protection of the City’s Natural Heritage System and Natural Resources, and ensure that development is outside of natural and anthropogenic hazards.</li> </ul>                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Map 1 of the London Plan identifies portions of the subject lands as Neighborhood, Green Space, and Environmental Review, these layers have been shown on Map 1 of this report.</li> <li>Map 5 of the London Plan indicates the presence of a Significant Vegetation Patch (northwest woodland), Non-Significant Vegetation Patch (northeast woodland), Unevaluated Vegetation Patch, Unevaluated Wetlands (2), Significant Valleylands and</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Policy/Legislation           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Project Relevance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|                              | <ul style="list-style-type: none"> <li>• Map 1 of the London Plan shows the Land Use.</li> <li>• Features included in the Natural Heritage System “Green Space Place Type” include: <ul style="list-style-type: none"> <li>○ Fish Habitat;</li> <li>○ Habitat of Endangered Species and Threatened Species;</li> <li>○ Provincially Significant Wetlands and Wetlands;</li> <li>○ Significant Woodlands and Woodlands;</li> <li>○ Significant Valleylands;</li> <li>○ Significant Wildlife Habitat;</li> <li>○ Areas of Natural and Scientific Interest;</li> <li>○ Water Resource Systems;</li> <li>○ Environmentally Significant Areas;</li> <li>○ Upland Corridors;</li> <li>○ Naturalization Areas; and</li> <li>○ Other lands as identified through environmental studies.</li> </ul> </li> <li>• Features and areas included in the Environmental Review Place Type include: <ul style="list-style-type: none"> <li>○ Unevaluated wetlands;</li> <li>○ Unevaluated vegetation patches;</li> <li>○ Valleylands; and</li> <li>○ Potential Environmentally Significant Areas.</li> </ul> </li> <li>• Map 5 shows Natural Heritage features and Map 6 shows Hazards and Natural Resources and are to be used in conjunction with the Environmental Policies.</li> </ul> | <p>(non-significant) Valleylands, these layers are shown on Map 2 of this report.</p> <ul style="list-style-type: none"> <li>• The former residential site fronting onto Bostwick Road and the forest immediately adjacent to the eastern boundary of the subject lands are both considered Unevaluated Vegetation Patches, although the Bostwick EA (Parsons 2019) did evaluate the old residential site/Cultural Savannah (CUS1) and Thornicroft Drain (Vegetation Unit #5) and recommended they be included with Patch 10064, or even be identified as significant on their own.</li> <li>• Thornicroft Drain is fish habitat.</li> <li>• Policy 1308 identifies actions that will be undertaken by the City to ensure the Natural Heritage System is protected, conserved, enhanced, and managed.</li> <li>• Policy 1326 identifies that an EIS will delineate the extent of SAR habitat including endangered, threatened, and special concern.</li> <li>• Policy 1328 identifies that development and site alteration shall not be permitted in endangered and threatened species habitat, except in accordance with provincial or federal requirements.</li> <li>• Policy 1391 indicates that development and site alteration shall not be permitted in Significant Woodlands, SWH, wetlands, or ANSIs unless it has been demonstrated there will be no negative impacts to the natural features or their ecological function.</li> <li>• Policy 1393 indicates that development and site alteration shall not be permitted on adjacent lands to natural heritage features and areas until appropriate studies have been completed to satisfy provincial and municipal policy and the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the features or their ecological functions.</li> </ul> |
| City of London Environmental | <ul style="list-style-type: none"> <li>• Outlines policy guidelines, standards, process and procedures for the preparation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• As this development application is within 120m of significant natural heritage features, an EIS is required</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Policy/Legislation                                                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                | Project Relevance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <p>Management Guidelines (2025)</p> <p>*Previous versions (2021 and 2007)</p> | <p>and review of Environmental Impact Studies, determination of buffers and setbacks, evaluation of significant woodlands, and SWM facilities.</p>                                                                                                                                                                                                                                                                                         | <p>and as such, the Environmental Management Guidelines (EMG) were to be followed through the project steps including data collection standards and guidelines for determining setbacks and ecological buffers.</p> <ul style="list-style-type: none"> <li>• The SLSR was prepared to follow the previous 2007 version of the EMG. This included the guidelines for determining setbacks and ecological buffers and utilizing Section 4.0 of the Guidelines to evaluate Woodland Significance.</li> <li>• As the Bostwick Avenue EA utilized the previous version, buffer allowances were allowed to be carried through to this development application (pers. comm. James MacKay). This included 10m buffers from Significant Woodlands, excluding the southern portion of Patch 10064 which borders the Bradley Avenue Extension and requires a 30m buffer, with a pathway that can be provided in the buffer area.</li> <li>• The EMG was revised in 2025, and new buffer recommendations from Significant Woodlands have been identified, with a minimum 20m buffer recommended from the dripline.</li> </ul> |
| <p>City of London Tree Preservation By-law C.P.-1555-252 (2021)</p>           | <ul style="list-style-type: none"> <li>• Regulates harm or destruction of trees within the Urban Growth Boundary</li> <li>• Outlines Tree Protection Areas</li> <li>• Amended by C.P.—1555(b) – 29 on December 21, 2021</li> </ul>                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>• Although tree removals as a condition of Site Plan Application are exempt, the general protections outlined must still be considered.</li> <li>• A tree inventory and Tree Protection Report must be completed in Tree Protection Areas.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p>Middlesex Natural Heritage Systems Study (UTRCA 2014)</p>                  | <ul style="list-style-type: none"> <li>• The study provides a landscape level assessment of natural heritage features and functions.</li> <li>• The study incorporated the most current information available from the MNRF at the time to identify areas that meet components of the PPS definition of significant. The methodology is intended to be a local approach to identifying elements of the natural heritage system.</li> </ul> | <ul style="list-style-type: none"> <li>• Figure 20 within the Natural Heritage Study indicates that the treed areas along the watercourse and the large feature in the northwest fulfill at least one of the criteria to be considered significant. The isolated forest stand to the east of the subject lands does not fulfill any of the criteria.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Policy/Legislation                                                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Project Relevance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| Southwest Area Plan (City of London 2019b)                                                | <ul style="list-style-type: none"> <li>Applies to lands in the southwest area of the City of London and was created to guide long-term management and approval of growth.</li> <li>The Southwest Area Plan was incorporated into the London Plan.</li> </ul>                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Serves as a review of planning applications which is used in conjunction with the other policies in the London Plan.</li> <li>Identifies principles and objectives for the southwest area of London.</li> </ul>                                                                                                                                                                                                                                                                                                                  |
| Bostwick Road Improvements Municipal Class Environmental Assessment (Parsons 2019)        | <ul style="list-style-type: none"> <li>SLSR and EIS for the realignment of Bostwick Road and Wonderland Road with extensive overlap in study areas to this report.</li> <li>Contains reports on vegetation, birds, reptiles and amphibians, significant features, fish and fish habitat and benthic invertebrates.</li> </ul>                                                                                                                                                  | <ul style="list-style-type: none"> <li>The report was reviewed with particular focus on significant species and SWH observations and recommended buffers.</li> <li>Assessed vegetation Patch 10065 as non-significant and the Unevaluated Patch as a Significant Woodland.</li> <li>Bradley Ave extension setbacks/buffer from patch 10064 apply to this development.</li> </ul>                                                                                                                                                                                        |
| Dingman Creek Subwatershed Stormwater Servicing Study (Aquafor Beach 2020)                | <ul style="list-style-type: none"> <li>A stormwater servicing strategy for the Dingman Creek subwatershed study area, Stage 1 lands, with consideration for flooding, erosion, groundwater, wildlife, and aquatic habitat, as well as natural corridor development.</li> <li>The North Lambeth (Thornicroft Drain) is addressed.</li> </ul>                                                                                                                                    | <ul style="list-style-type: none"> <li>Covers all aspects of the Thornicroft Drain watershed with comprehensive consideration of previously completed EAs and other studies.</li> <li>Contains information relating to the species present within the Thornicroft Drain and issues pertaining to habitat quality.</li> <li>Provides detailed information regarding SWM requirements within the study area.</li> <li>Provides detailed information regarding setbacks and significant features.</li> </ul>                                                               |
| O. Reg. 41/24 Prohibited Activities, Exemptions, and Permits (Government of Ontario 2024) | <ul style="list-style-type: none"> <li>O. Reg. 41/24 came into effect April 1, 2024 and supplements the existing Conservation Authorities Act (Government of Ontario 1990) to provide protections and exemptions to development within or adjacent to watercourses and/or wetlands.</li> <li>O. Reg. 41/24 identifies constraints associated with wetlands, watercourses, and shorelines within the Upper Thames River Conservation Authority (UTRCA) jurisdiction.</li> </ul> | <ul style="list-style-type: none"> <li>Regulated areas are present within the study area including wetlands, drainage features, and Thornicroft Drain.</li> <li>Development, alteration, or interference with wetlands is prohibited within 30m of a wetland, subject to approval by the UTRCA.</li> <li>The UTRCA may grant permission of development within regulated areas should it be shown that no impact will occur. An application for submission must be submitted to the UTRCA prior to any approval for development within these regulated areas.</li> </ul> |
| Migratory Birds Convention Act (MBCA), 1994 and Migratory Bird                            | <ul style="list-style-type: none"> <li>The MBCA protects migratory game birds, insectivorous birds, and several other</li> </ul>                                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>The timing of construction activities, especially vegetation clearing and site grading, must have consideration for the MBCA.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                         |

| Policy/Legislation                                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Project Relevance                                                                                                                                                                                                   |
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| Regulations (MBR), 2022                                         | <p>migratory non-game birds from persecution in the form of harassment.</p> <ul style="list-style-type: none"> <li>• The schedule of on-site work must consider MBCA timing windows, with the breeding bird season typically occurring between April 1 and August 31, however, this is a guideline, since the MBCA applies to nesting bird species at any time.</li> <li>• “Incidental take” is considered illegal, with the exception of a permit obtained by the Canadian Wildlife Service (CWS).</li> <li>• Schedule 1 of the MBR 2022 provides year-round nest protection for 18 species that are known to re-use nests annually.</li> </ul> |                                                                                                                                                                                                                     |
| Fish and Wildlife Conservation Act (Government of Ontario 2021) | <ul style="list-style-type: none"> <li>• The FWCA provides protection for certain bird species not protected under the MBCA (e.g., raptors), as well as furbearing mammals and their dens or habitual dwellings, asides from the Red Fox (<i>Vulpes vulpes</i>) and Striped Skunk (<i>Mephitis mephitis</i>).</li> </ul>                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>• The timing of construction activities, especially vegetation clearing and site grading must have consideration for birds and den sites for fur-bearing mammals.</li> </ul> |

## 1.2 Project Scope

This EIS was scoped according to discussions with City of London, UTRCA and a member of the Ecological Community Advisory Committee (formerly Environmental and Ecological Planning Advisory Committee) during a virtual project scoping meeting held on December 21, 2021. As the meeting was held in late December, not everyone was able to attend, and as such additional meetings were held to discuss the project and scope. The comprehensive field investigations were completed prior to the formal scoping meeting.

As part of the scoping meeting on December 21, 2021, an Issues Summary Checklist Report was completed on November 17, 2021, which was subsequently updated to the newer version of the Environmental Study Scoping Checklist for the scoping meeting.

As multiple meetings and discussions have occurred with City Ecologists to discuss the scope and the SLSR, a table has been provided below to summarize these meetings.

**Table 2. Scoping and Project Meetings**

| Meeting / Item                                                                                                                          | Discussion / Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| EIS Scoping Meeting <ul style="list-style-type: none"><li>Scoping Checklist originally submitted to City on November 17, 2021</li></ul> | <ul style="list-style-type: none"><li>Scoping meeting following the checklist was completed on December 21, 2021. City Ecologists Shane Butnari and Emily Williamson were in attendance.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Revised Scoping Checklist<br>January 7, 2022                                                                                            | <ul style="list-style-type: none"><li>Revised scoping checklist based on the meeting provided to agencies/project team on January 7, 2022.</li><li>Response from EEPAC on January 7, 2022 (S. Levin) identifying that the scoping document does not include Environmental Management Recommendation, and that these should be considered/included.</li><li>Response from City Ecologist (J. MacKay) on January 7, 2022 identifying that he would continue on the project for now. As well as that an SLSR was not specifically required for this project since Bradley Avenue Extension EA was approved by Council and there was detailed information on the natural features.</li><li>As SLSR was already prepared, was submitted to the agencies / project team.</li></ul> |
| Hydrogeology Scoping Meeting<br>January 19, 2022                                                                                        | <ul style="list-style-type: none"><li>Held on January 19, 2022 and led by EXP (Heather Jaggard) to discuss scope of works that have been completed and still were required to be completed.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Scope Discussion<br>February 2, 2022                                                                                                    | <ul style="list-style-type: none"><li>Email response from City Ecologist (James MacKay) regarding having an internal discussion on the SLSR as it did not align with Bostwick Road EA as it related to the Cultural Savannah being a Significant Woodland.</li><li>Email response from NRSI regarding Bostwick Road EA and buffers on January 24, 2022.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                            |

| Meeting / Item                         | Discussion / Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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|                                        | <ul style="list-style-type: none"> <li>Led to a meeting between City Ecologist (James MacKay) and NRSI (Gina MacVeigh) on February 2, 2022</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Project Discussion<br>February 3, 2022 | <ul style="list-style-type: none"> <li>Virtual Meeting on February 3, 2022.</li> <li>Discussion Points: <ul style="list-style-type: none"> <li>Identified items below were approved through City managers.</li> <li>Although the new EMG is in place, James indicated that the project can be completed under the old EMG document. EIS would need to acknowledge that the new EMG is in place but that this had been a previous project and the report would be consistent with other documents under the old EMG. James MacKay did ask that the report be in the new EMG format.</li> <li>Under the old EMG he is comfortable with a 10m dripline buffer from the FOD feature (eastern edge / Patch 10065).</li> <li>For the Significant Valleyland (complete corridor) James MacKay indicated (after confirming with other staff) that the buffer can be the 30m (from the watercourse/corridor), 10m dripline or 30m wetland buffer - whichever is the furthest out.</li> <li>As the works are proceeding under the old EMG, the wetland buffer around the TDT1-1 could be less than 30m. James indicated 15m would be appropriate with a little wider buffer closer to Thornicroft Drain.</li> <li>James MacKay asked about the golf course pond that NRSI identified that it was not significant based on the surveys completed. James MacKay indicated that he looked at old aerial imagery and it may have started as a wetland that was dug, so it may need to be compensated for (1:1 ratio). Pond has been managed and maintained as an irrigation pond for numerous years and was surveyed for SWH.</li> <li>James MacKay asked about the other HDF's on the site and Gina MacVeigh indicated that HDF surveys were completed and that only 2 came out as protection (in the CUS and the TDT1-1). James MacKay asked about the one that 'connects' the FOD (10065) to the large woodland (10064) and Gina indicated that it was identified as requiring no management under the HDF and that NRSI observed a broken tile drain. He was supportive of not requiring any sort of connection from the features since there will be more development in the FOD 10065 area along with the Bradley Avenue extension.</li> <li>James MacKay was supportive with the Willow area along the eastern edge being removed with appropriate tree compensation in accordance with the City's typical requirements.</li> </ul> </li> </ul> |
| Site Investigation                     | <ul style="list-style-type: none"> <li>As Grounded Solutions (Margot Ursic) was retained by the City of London, a site investigation was planned to discuss the application. City Ecologist Marnie Shepley also attended.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Meeting / Item                                     | Discussion / Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|                                                    | <ul style="list-style-type: none"> <li>As a follow-up from the site meeting, the SLSR was requested again, as well as a follow-up meeting regarding buffers and compensation, as well as to provide additional information on the Cultural Savannah feature and what made it 'Significant'.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Project Understanding Meeting<br>November 28, 2022 | <ul style="list-style-type: none"> <li>Virtual meeting on November 28, 2022 between Grounded Solutions (Margot Ursic), City of London (Marnie Shepley), and NRSI (Katharina Richter and Gina MacVeigh) to discuss previous City discussions, as well as potential synergies between the Westwinds project and this project.</li> <li>Key points from meeting: <ul style="list-style-type: none"> <li>Marnie Shepley is involved in Thornicroft corridor review along with Margot Ursic and James MacKay.</li> <li>City and Grounded Solutions asked for rationale on the CUS being significant. NRSI indicated that it was not shown as significant on EIS mapping to allow for discussion and openness to using it as natural parkland and SWM. Margot Ursic was inclined to agree with NRSI on CUS not being significant. Margot Ursic agreed that most important feature in the area is the HDF, which she considered a watercourse. Would need to be protected with an appropriate corridor. Also identified that it should be in line with Westwinds Development.</li> <li>Margot Ursic identified that care needs to be taken if indicating that something is not significant that had previously been identified as significant and would need proper documentation and rationale (i.e. for the CUS).</li> <li>Compensation from 3080 Bostwick discussed and Margot Ursic indicated that the woodland compensation amount was to be confirmed at a later meeting with Stantec.</li> <li>Willow Plantation and tree removal would require a tree inventory.</li> <li>East woodland to be protected by a 10m buffer.</li> <li>CUS1 is identified as OS1 by York and James MacKay had wanted it OS5. Margot Ursic indicated that basketball courts would not be appropriate, but trails, a SWM facility, and open areas ('natural parkland') would be appropriate. Connection to the other side of Bostwick is important.</li> </ul> </li> </ul> |

The final scoping checklist and agency correspondence are provided in Appendix III.

## **2.0 Physical Environment**

### **2.1 Soil, Terrain, and Drainage**

The subject lands lie within the Upper Thames River watershed, which falls under the jurisdiction of the UTRCA. The Upper Thames watershed is 3,420km<sup>2</sup> (UTRCA 2017) and contains 28 subwatersheds. The Dingman Creek subwatershed, where the study area is located, contains many significant groundwater recharge areas and highly vulnerable aquifers. The woodland in the northern extent of the subject lands and a portion of the treed area along the Thornicroft Drain have been mapped by the UTRCA as containing a Significant Groundwater Recharge Area (UTRCA 2021).

The subject lands are bisected by the Thornicroft Drain; a permanent watercourse that flows in a north to south direction. Previous surveys have found the Thornicroft Drain to have either a cool-warm water thermal regime (Parsons 2019) or coolwater thermal regime (UTRCA 2017). NRSI's aquatic habitat assessment and temperature monitoring found the drain's thermal regime to be consistent with a "Warm-Cool" system. The adjacent agricultural fields are tiled and provide seasonal flows to the main channel of the Thornicroft Drain. An unnamed watercourse / headwater drainage feature (HDF) (TDT17-1, TDT17-2 on Map 5) originates to the west of Bostwick Road and directs intermittent flow into Thornicroft Drain. West of Bostwick Road, the drainage feature is tiled.

The study area lies primarily within the physiographic region called the Mount Elgin Ridges and is located on undrumlinized till plains (EXP 2024). The surficial geology of the site is characterized by clay to silt textured till derived from glaciolacustrine deposits (OGS 2022; EXP 2024). Soils are characterized as Huron Clay Loam in the northern portion of the site and Guelph Loam in the southern portion; both soil types exhibiting moderate to imperfect surface drainage (Hagerty & Kingston 1992).

The overall topography of the subject lands is relatively flat, with some undulation and a gradual decline toward the central watercourse. Elevations range from about 275masl along Bostwick Road in the northwest portion of the subject lands to about 262masl in the vicinity of lands fronting onto Wharncliffe Road South; a fall of 13m (EXP 2024).

As part of determining the limit of development within the subject lands, Matrix Solutions Inc., updated the regional 250-year floodline (Matrix 2022) and the erosion hazard limits (Matrix 2022).

## 2.2 Hydrogeology

A hydrogeological assessment of the subject lands was undertaken by EXP Services Inc. (2024). The hydrogeological assessment involved the drilling of nine boreholes across the site and installation of monitoring wells within the boreholes to sample and test groundwater quality and elevation. Additionally, a total of 12 surface water stations were installed in the subject lands and were monitored using either a staff gauge, piezometer or a combination of both. The surface water stations were installed in locations with or with the potential to have seasonal surface water or shallow groundwater flow. Surface water was sampled from the Thornicroft Drain and analyzed for a range of water quality parameters. Hydraulic conductivity testing was completed at the installed monitoring wells using two methods, the first using single well response tests and the second using soil sample particle size analysis to provide a calculated estimation of hydraulic conductivity (EXP 2024).

The surficial geology of the site is generally characterized by low permeability clayey silt, silty clay across the site. Topsoil is generally present across the site at the surface, with fill material or till encountered beneath the topsoil. Based on EXP's findings the subject lands comprise two hydrostratigraphic units, a silt, clayey silt till and silty clay till unit that is interpreted to be an aquitard, and a silty sand, sandy silt, sand aquifer unit. The aquitard unit can store water and slowly transmit water from one aquifer to another. It is anticipated that a perched water table is likely to be present within the aquitard. The aquifer unit is unconfined in the northern portion of the site and confined in the southern portion of the subject lands (EXP 2024).

The shallowest groundwater levels were noted in the southern portion of the subject lands, while the deepest groundwater levels were noted in a monitoring well installed in the northern portion of the subject lands. Groundwater elevations in the monitoring wells were cyclical and showed seasonal variation, generally seasonal high elevations were observed in the spring (EXP 2024).

Areas associated with the woodland in the north of the subject lands, along the Thornicroft Drain and in the southern portion of the site have been identified as being within a Significant Groundwater Recharge Area according to the Upper Thames River Assessment Report (UTRCA 2011). The identification of Significant Groundwater Recharge Areas in the northern woodland and along the Thornicroft Drain are support by EXP (2024). Due to the presence of a thick aquitard in the southern portion of the site it is EXP's opinion that these lands should not be treated as a Significant Groundwater Recharge Area, and as a result, lower post-development infiltration maintenance is appropriate (EXP 2024).

A Highly Vulnerable Aquifer is also mapped in the southern portion of the subject lands. Similarly, due to the presence of a thick aquitard, it is EXP's opinion that lands in the southern portion of the site, not including those in the immediate vicinity of the drain, should not be characterized as a Highly Vulnerable Aquifer (EXP 2024).

### **2.3 Designated Natural Areas**

Information on designated natural areas (ANSI's, ESA's, etc.), was reviewed from the UTRCA, NHIC (MNRF 2023a), the London Plan (City of London 2026), the Dingman Creek Subwatershed Study (Delcan Corporation 2005), the Natural Heritage Systems Study (UTRCA 2014), and the Dingman Creek Subwatershed Stormwater Servicing Study (Aquafor Beech 2020).

No designated natural features are located within or adjacent to the subject lands.

### **3.0 Natural Environment – Background Information**

#### **3.1 Collection and Review of Background Information**

Existing natural heritage information was collected and reviewed in 2019 in order to determine a study approach for the SLSR. This information was used to identify key natural heritage features, habitats and species that are reported from, or have the potential to occur within the study area. The species lists were updated in 2023 to ensure that any new species records have been captured within the EIS. Additional EIS reports from within the area have been reviewed to provide a fulsome understanding of the study area, as well as to ensure that measures outlined in those reports are applied where applicable to the subject lands.

The following background information sources were reviewed:

- City of London Official Plan (2026);
- City of London Environmental Management Guidelines (2025);
- Land Information Ontario (LIO) data base mapping;
- Natural Heritage Information Centre (NHIC) (MNRF 2023a);
- Ontario Breeding Bird Atlas (BSC et al. 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Butterfly Atlas (Macnaughton et al. 2023)
- Ontario Odonata Atlas (Ontario Odonata Atlas Database 2023);
- Aquatic Species at Risk Mapping (DFO 2023);
- AgMaps data base mapping (OMAFRA 2023);
- Ontario Geohub Aquatic Resource Area Line and Points (MNRF 2023b);
- Dingman Creek Subwatershed: Stormwater Servicing Study Phase 1 Report (Aquafor Beech Limited 2020);
- Dingman Creek Subwatershed Study Update (Delcan Corporation 2005);
- Subject Lands Status Report and Environmental Study Report - Bostwick Road Improvements Municipal Class EA (Parsons 2019);
- 3080 Bostwick Road - Environmental Impact Study – Update and Addendum (Stantec 2018, 2020, 2022);
- Middlesex Natural Heritage System Study (UTRCA 2014);
- Dingman Creek Watershed Report Card (UTRCA 2023); and

- Southwest Area Secondary Plan (City of London 2024).

Species lists were compiled to provide information on species reported from within the vicinity of the study area based on data available from the wildlife atlases listed above. These atlases provide data based on 10x10km survey squares. Information on species from the survey squares that overlap with the study area (17MH85) were compiled.

### 3.2 Significant Species and Habitat Screening

Based on the initial species lists obtained through the background review in 2019, Protected Species (formerly referred to as Species at Risk (SAR)) and Species of Conservation Concern (SCC) were identified from the study area. This screening was updated using the species lists in 2023 and further updated in 2026 to reflect changes brought forward by the implementation of the Species Conservation Act (SCA), 2025. For the purposes of this EIS, Protected Species are those listed on the Protected Species in Ontario List (O. Reg. 60/26 <https://www.ontario.ca/laws/regulation/260060>). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially threatened or endangered. These species are protected by the SCA, which includes protection of their habitat.

Species of Conservation Concern (SCC) are those identified as:

- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the NHIC;
- Species classified as Special Concern by the COSSARO, and
- Species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC) but not provincially by the COSSARO.

Aquatic species and migratory birds listed as Threatened or Endangered on Schedule 1 of the *Species at Risk Act* (SARA) have also been considered in this EIS. The residence of these species and Critical Habitat of listed aquatic species is protected on all lands. For the purposes of this report, these species are considered federally regulated species.

Habitat for terrestrial SCC may be considered Significant Wildlife Habitat (SWH) (OMNR 2010), which is afforded protection under the Provincial Policy Statement (PPS) (OMMAH 2020) and municipal natural heritage protection policies. Habitat for aquatic SCC is afforded protection

under the fish habitat provision of the PPS and the federal *Fisheries Act*. According to the MNRF guidelines, to inventory a site for the identified special concern or rare species, studies need to be completed during the time of year when the species is present or easily identifiable, and for SCC habitat to qualify as SWH it needs to be easily mapped and cover an important life stage component for the species (e.g., specific nesting habitat, foraging habitat, etc.) (MNRF 2015).

A preliminary screening exercise was conducted in 2019 on these species to identify which species have suitable habitat within the subject lands and the study area, and was provided as part of the scoping package to the City and UTRCA. This screening was refined based on the field investigations and additional agency correspondence received. This involved cross-referencing the preferred habitat for reported Protected Species and SCC (OMNR 2000) against habitats known to occur on the subject lands or adjacent lands. This was completed to ensure that the potential presence of all Protected Species and SCC within the subject lands was adequately considered in this EIS. This screening was updated in 2023 to ensure that species designations were correct (e.g. Barn Swallow (*Hirundo rustica*) was downlisted provincially).

Of the Protected Species and SCC that were identified as having records within the study area and surrounding 10km, numerous species were flagged during the preliminary screening as potentially having suitable habitat within the study area. The field surveys conducted in 2019 to 2023 were designed to identify if potential regulated Protected Species or SCC and their habitats were present within the subject lands. The final significant species screening, updated based on the results of field surveys, is provided in Appendix III.

A screening exercise was also conducted to determine the presence of any SWH types within the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) outlines the types of habitats that the MNRF considers significant in Ontario, as well as criteria to identify these habitats for Ecoregion 7E, in which the study area is located (OMNR 2000, MNRF 2015). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of SCC, and animal movement corridors.

Based on the results of the screening exercise, several candidate SWH types were identified as occurring, or having the potential to occur within the study area. Field surveys assessing the presence of the potential SWH types were completed and the results are summarized in the

sections below. The final SWH screening updated based on the results of field surveys is provided in Appendix IV.

### **3.3 Field Methods**

Where possible, field surveys were undertaken within the subject lands and adjacent lands where previous survey stations had been identified (Parsons 2019) in order to characterize natural features and identify significant and sensitive natural features and species that have potential to be impacted by the proposed development.

Surveys conducted were undertaken in accordance with provincial and local guidance documents as indicated below. A total of 19 field survey visits were completed between April 2019 and November 2019. An additional survey was completed in September 2021 to capture a small change in the subject land boundary. In 2023, a bat cavity assessment was completed based on the expected natural heritage crossing locations, for a total of 21 field survey visits.

Table 3 summarizes the field site investigations completed for the subject lands.

**Table 3. Field Survey Summary**

| Survey Type                                | Protocol                              | Date               | Time (hrs)  | Weather Conditions*                                                  | Lead Observer |
|--------------------------------------------|---------------------------------------|--------------------|-------------|----------------------------------------------------------------------|---------------|
| <b>Terrestrial Surveys</b>                 |                                       |                    |             |                                                                      |               |
| ELC/Vascular Flora Inventory               | Lee et al. 1998 Search by ELC polygon | May 6, 2019        | 1000 – 1600 | Air °C: 21<br>Precip.: Intermittent<br>Cloud Cover (%): 0<br>Wind: 1 | A. Dean       |
|                                            |                                       | July 5, 2019       | 0620 – 1345 | Air °C: --<br>Precip.: --<br>Cloud Cover (%): --<br>Wind: --         | P. Deacon     |
|                                            |                                       | September 26, 2019 | 1000 – 1600 | Air °C: 18<br>Precip.: None<br>Cloud Cover (%): 80<br>Wind: 3        | K. Ellis      |
|                                            |                                       | September 20, 2021 | 0900 - 1600 | Air °C: 16<br>Precip.: None<br>Cloud Cover (%): 60<br>Wind: 3        | K. Richter    |
| Butternut Health Assessment                | MNRF 2015                             | August 26, 2019    | -           | Air °C: --<br>Precip.: --<br>Cloud Cover (%): --<br>Wind: --         | J. Bannon     |
| Bat Cavity Tree Assessment                 | MNRF 2017                             | April 10, 2019     | 1100 – 1330 | Air °C: 2<br>Precip.: None<br>Cloud Cover (%): 80<br>Wind: 3         | T. Brenton    |
| *2023 Survey focused on crossing locations | MECP 2022a, MECP 2022b                | April 6, 2023      | 0830 – 1230 | Air °C: 5<br>Precip.: None<br>Cloud Cover (%): 80<br>Wind: 2         | S. Howe       |
| Breeding Bird Surveys                      | OBBA 2001                             | May 29, 2019       | 0658 - 0942 | Air °C: 12<br>Precip.: Drizzle<br>Cloud Cover (%): 100<br>Wind: 2    | K. Ellis      |

| Survey Type                     | Protocol  | Date           | Time (hrs)  | Weather Conditions*                                                  | Lead Observer |
|---------------------------------|-----------|----------------|-------------|----------------------------------------------------------------------|---------------|
|                                 |           | June 14, 2019  | 0716 - 0918 | Air °C: 12<br>Precip.: None<br>Cloud Cover (%): 5-30<br>Wind: 2      | C. Teat       |
|                                 |           | July 5, 2019   | 0612 - 0843 | Air °C: 22-26<br>Precip.: None<br>Cloud Cover (%): 5<br>Wind: 1      | P. Deacon     |
| Lepidoptera and Odonate Surveys | --        | June 11, 2019  | 1015 – 1325 | Air °C: 19<br>Precip.: None<br>Cloud Cover (%): 5<br>Wind: 1         | C. Teat       |
|                                 |           | July 5, 2019   | 0620 - 1345 | Air °C: 20-28<br>Precip.: None<br>Cloud Cover (%): 0-10<br>Wind: 0-2 | P. Deacon     |
| Migratory Bird Survey           | MNRF 2015 | April 10, 2019 | 0722 – 0940 | Air °C: 1-3<br>Precip.: None<br>Cloud Cover (%): 5<br>Wind: 2-4      | T. Brenton    |
| Crepuscular Bird Survey         | MNRF 2015 | June 12, 2019  | 2134 – 2323 | Air °C: 18<br>Precip.: None<br>Cloud Cover (%): 50<br>Wind: 1        | A. Reinhart   |
|                                 |           | June 25, 2019  | 2155 – 2257 | Air °C: 20<br>Precip.: None<br>Cloud Cover (%): 10<br>Wind: 0-1      | G. MacVeigh   |
| Anuran Call Surveys             | BSC 2009  | April 9, 2019  | 2030 - 2125 | Air °C: 7-10<br>Precip.: None<br>Cloud Cover (%): 100<br>Wind: 0-2   | G. MacVeigh   |
|                                 |           | May 16, 2019   | 2037 - 2245 | Air °C: 16<br>Precip.: None                                          | K. Burrell    |

| Survey Type                          | Protocol  | Date           | Time (hrs)  | Weather Conditions*                                              | Lead Observer |
|--------------------------------------|-----------|----------------|-------------|------------------------------------------------------------------|---------------|
|                                      |           |                |             | Cloud Cover (%): 20-80<br>Wind: 1-3                              |               |
|                                      |           | June 12, 2019  | 2137 - 2354 | Air °C: 17<br>Precip.: None<br>Cloud Cover (%): 60<br>Wind: 1-3  | A. Reinhart   |
| Turtle Emergence and Basking Surveys | MNRF 2015 | April 24, 2019 | 1410 – 1430 | Air °C: 10<br>Precip.: None<br>Cloud Cover (%): 60<br>Wind: 3    | K. Ellis      |
|                                      |           | May 6, 2019    | 1030 - 1145 | Air °C: 19<br>Precip.: None<br>Cloud Cover (%): 0<br>Wind: 2     | G. MacVeigh   |
| Turtle Nesting Surveys               | MNRF 2015 | June 18, 2019  | 1930 - 2000 | Air °C: 23<br>Precip.: None<br>Cloud Cover (%): 5<br>Wind: 1     | G. MacVeigh   |
|                                      |           | June 25, 2019  | 2130 - 2210 | Air °C: 20<br>Precip.: None<br>Cloud Cover (%): 10<br>Wind: 0-1  | G. MacVeigh   |
|                                      |           | July 10, 2019  | 0900 - 1530 | Air °C: 23-31<br>Precip.: None<br>Cloud Cover (%): 5<br>Wind: 1  | G. MacVeigh   |
| Snake Coverboard Surveys             | MNRF 2016 | April 24, 2019 | 0852 - 1430 | Air °C: 10<br>Precip.: None<br>Cloud Cover (%): 60-10<br>Wind: 3 | K. Ellis      |
|                                      |           | May 6, 2019    | 0945 - 1245 | Air °C: 16<br>Precip.: None<br>Cloud Cover (%): 0<br>Wind: 2     | N. Allen      |

| Survey Type                             | Protocol  | Date               | Time (hrs)  | Weather Conditions*                                                  | Lead Observer |
|-----------------------------------------|-----------|--------------------|-------------|----------------------------------------------------------------------|---------------|
|                                         |           | May 29, 2019       | 0645 - 1036 | Air °C: 11<br>Precip.: Drizzle<br>Cloud Cover (%): 100<br>Wind: 1    | K. Ellis      |
|                                         |           | June 11, 2019      | 1015 - 1325 | Air °C: 19<br>Precip.: None<br>Cloud Cover (%): 5<br>Wind: 3         | C. Teat       |
|                                         |           | June 12, 2019      | 2100 - 2130 | Air °C: 17<br>Precip.: None<br>Cloud Cover (%): 50<br>Wind: 1        | A. Reinhart   |
|                                         |           | July 10, 2019      | 0920 - 1540 | Air °C: 20<br>Precip.: None<br>Cloud Cover (%): 5<br>Wind: 1         | G. MacVeigh   |
| Significant Wildlife Habitat Assessment | MNRF 2015 | April 10, 2019     | 1200 - 1330 | Air °C: 1<br>Precip.: None<br>Cloud Cover (%): --<br>Wind: 4         | T. Brenton    |
|                                         |           | April 24, 2019     | 1052 - 1530 | Air °C: --<br>Precip.: --<br>Cloud Cover (%): --<br>Wind: --         | K. Ellis      |
|                                         |           | May 6, 2019        | 0930 - 1500 | Air °C: 21<br>Precip.: None<br>Cloud Cover (%): 0<br>Wind: 1-3       | A. Dean       |
|                                         |           | July 5, 2019       | 0620 - 1345 | Air °C: 22-28<br>Precip.: None<br>Cloud Cover (%): 0-10<br>Wind: 0-2 | P. Deacon     |
| Woodland Dripline Delineation           | --        | September 26, 2019 | 1000 – 1600 | Air °C: 18<br>Precip.: None                                          | K. Ellis      |

| Survey Type                                                                                     | Protocol                          | Date                       | Time (hrs)  | Weather Conditions*                                                  | Lead Observer           |
|-------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------|-------------|----------------------------------------------------------------------|-------------------------|
|                                                                                                 |                                   |                            |             | Cloud Cover (%): 80<br>Wind: 3                                       |                         |
|                                                                                                 |                                   | September 20, 2021         | 0900 - 1600 | Air °C: 16<br>Precip.: None<br>Cloud Cover (%): 60<br>Wind: 1        | K. Richter              |
| Wetland Delineation<br>(Review with City Ecologist James MacKay and UTRCA Ecologist Tara Tchir) | MNRF 2022                         | October 8, 2019            | 0745 – 1200 | Air °C: 24<br>Precip.: None<br>Cloud Cover (%): 25<br>Wind: 1        | P. Deacon               |
| <b>Aquatic Field Surveys</b>                                                                    |                                   |                            |             |                                                                      |                         |
| Benthic Macroinvertebrate Survey                                                                | Griffiths 1999                    | June 5, 2019               | 1030 - 1230 | Air °C: 14<br>Precip.: Light Rain<br>Cloud Cover (%): 100<br>Wind: 0 | B. Baldwin              |
| Temperature Logging                                                                             | --                                | Deployed June 5, 2019      | 1030 - 1230 | Air °C: 14<br>Precip.: Light Rain<br>Cloud Cover (%): 100<br>Wind: 0 | B. Baldwin              |
|                                                                                                 |                                   | Retrieved November 5, 2019 | 1300 - 1400 | Air °C: 3<br>Precip.: None<br>Cloud Cover (%): 60<br>Wind: 4         | B. Baldwin              |
| Headwater Drainage Feature Assessment                                                           | CVC and TRCA 2014, Stanfield 2017 | April 9, 2019              | 1100 - 2000 | Air °C: 5<br>Precip.: None<br>Cloud Cover (%): 0<br>Wind: 10         | G. MacVeigh, B. Baldwin |
|                                                                                                 |                                   | June 5, 2019               | 1030 - 1630 | Air °C: 14<br>Precip.: Light Rain<br>Cloud Cover (%): 100<br>Wind: 0 | B. Baldwin, A. Cantwell |
|                                                                                                 |                                   | July 9, 2019               | 0900 - 1540 | Air °C: 20<br>Precip.: None                                          | G. MacVeigh             |

| Survey Type                      | Protocol                              | Date         | Time (hrs)  | Weather Conditions*                                                 | Lead Observer         |
|----------------------------------|---------------------------------------|--------------|-------------|---------------------------------------------------------------------|-----------------------|
|                                  |                                       |              |             | Cloud Cover (%): 5<br>Wind: 1                                       |                       |
| Aquatic Habitat Characterization | Stanfield 2017 (modified OSAP)        | July 9, 2019 | 1630 - 1700 | Air °C: 20<br>Precip.: None<br>Cloud Cover (%): 0<br>Wind: 1        | G. MacVeigh, S. Catry |
| Fish Community Screening         | Stanfield 2017 (Screening level OSAP) | July 9, 2019 | 0900 - 1535 | Air °C: 24-29<br>Precip.: None<br>Cloud Cover (%): 100<br>Wind: 2-3 | S. Catry, N. Allen    |

\* Wind speed utilizes Beaufort Scale

### **3.4 Terrestrial Habitat and Species**

#### **3.4.1 Vegetation Surveys**

Vegetation community delineation was completed using aerial photography prior to field verification on May 6, 2019. Communities were subsequently refined during detailed seasonal vascular plant inventories and are shown on Map 3. Groundwater indicator species observations are also shown on Map 3. The standard Ecological Land Classification (ELC) System for southern Ontario was applied (Lee et al. 1998). Details of vegetation communities were recorded including species composition, dominance, uncommon species or features, and evidence of human impact.

All observed species of vascular flora were recorded during field surveys on May 6, July 5, and September 26, 2019, as well as on September 20, 2021. These surveys correspond to spring, summer, and fall-based botanical inventories, and included mapping where ground water indicator species were located.

Particular focus was placed on surveying for significant plant species that were identified as having suitable habitat within the subject lands (see the Protected Species and SCC screening in (Appendix III), as well as to identify groundwater indicator species.

#### **3.4.2 Woodland Dripline Delineation**

A delineation of the woodland dripline was completed within the subject lands on September 26, 2019, using a SXBlue II GNSS GPS unit which collects point data with sub-50 cm accuracy. As the subject lands expanded, an additional site visit was completed on September 20, 2021 to collect the remaining points. The woodland dripline is shown on Map 3.

#### **3.4.3 Wetland Delineation**

The wetlands within the subject lands were flagged and confirmed with City and UTRCA staff on October 8, 2019. The points were collected using a SXBlue II GNSS GPS unit which collects point data with sub-50 cm accuracy. The wetland units are shown on Map 3.

#### **3.4.4 Bird Surveys**

##### **Migratory Bird Surveys**

A single migratory bird survey was conducted on April 10, 2019 to document use of the natural features by migratory birds. The survey included a 10-minute point count at 7 locations within

the subject lands (see Bird Survey Station (BSS) locations on Map 4). The surveyor documented each species and the total number observed.

### **Breeding Bird Surveys**

Breeding bird surveys were completed on May 29, June 14, and July 5, 2019. Surveys consisted of 10-minute point counts at 7 stations within different habitat types, as well as incidental observations made between point count locations. Surveys were undertaken between dawn and 1000hrs. Point count locations are shown on Map 4, as indicated by Bird Survey Station (BSS), and are consistent with the survey locations for migratory birds. All visual and auditory observations of birds were recorded as well as the highest level of breeding evidence exhibited for each species. Breeding evidence was noted in accordance with the Ontario Breeding Bird Atlas protocol (BSC 2009).

### **Crepuscular Bird Surveys**

In addition to early morning breeding bird surveys, crepuscular/nocturnal surveys were conducted on June 12 and 25, 2019, specifically to detect Common Nighthawk (*Chordeiles minor*) which is active during the evening/night. Consistent with protocol recommendations from the MNRF at the time, the survey period was determined by lunar conditions (G. Buck, pers. comm. 2012). In southern Ontario, Common Nighthawks breed from late May through June and into the first week of July (G. Buck, pers. comm. 2012). Surveys were conducted when the lunar phase was at least 50% illuminated, during evenings with no precipitation, low wind, and good visibility between 30 minutes before sunset until midnight (2400hrs). This involved conducting 10-minute point counts at 4 stations (CNH stations on Map 4) within suitable habitat for Common Nighthawk. Each station was surveyed twice during a single lunar cycle.

### **3.4.5 Herpetofauna Surveys**

#### **Snake Surveys**

Coverboard surveys were undertaken to identify snake species present within the subject lands. In order to conduct active searches and coverboard surveys, a Wildlife Scientific Collectors Authorization was obtained from the MNRF. The permit (#1092458) was obtained April 1, 2019 from the MNRF Aylmer district office.

A total of 15 snake coverboards were installed within the subject lands on April 10, 2019 and are shown on Map 4. The location of the coverboards replicated the approximate location of the 7 coverboards that were placed as part of the EA (Parsons 2019), with an additional 8

coverboards placed in new locations conducive to snakes. Each board measured 4ft x 4ft with the upper surface painted black to absorb heat. Boards were checked a total of 6 times between April 24 and July 10, 2019 for the presence of snakes. Snake cover boards were checked in the morning or late evening to avoid hot mid-day temperatures when snakes may avoid using the boards to thermoregulate. When checking boards, biologists lifted each board slowly to check for snakes underneath, taking care to replace the board to its original position. All snake species, number of individuals, approximate length, and behaviour were recorded.

### **Turtle Surveys**

NRSI biologists conducted 2 turtle emergence surveys to identify the presence of turtles that may be using the pond within the golf driving range or adjacent areas. The surveys were conducted on April 24 and May 6, 2019 on sunny days with air temperatures greater than 10°C. The pond was approached and scanned with binoculars.

Potential turtle nesting habitat was identified in the vicinity of the pond at the northwest corner of the golf driving range where well-drained soils are present within the agricultural field and sandy ridges present within the golf driving range. Area searches for turtle nesting were completed on 3 dates in June and early July in the evening between 1900hrs and 2200hrs. The survey location, identified as 100m from the pond, is shown on Map 4.

### **Anuran Call Surveys**

Evening anuran (frog and toad) call surveys were conducted on April 9, May 16, and June 12, 2019 according to the Marsh Monitoring Program protocol (BSC 2009) at 10 stations (Map 4). Monitoring focused on calling frogs and toads during 3-minute surveys, which included call intensity and an estimated number of individuals. Additional information, including survey time, air and water temperature, wind speed, and cloud cover were recorded at each survey station. The 10 stations were chosen as they were either the same, or in similar locations, as the Bostwick Road EA locations, so that data could be compared.

### **3.4.6 Significant Species and Habitat Assessments**

The habitats of all regulated Protected Species and SCC and all SWH types identified as potentially occurring within the study area during the background review were further assessed for their presence within the subject lands during surveys on April 10, April 24, May 6, and July 5. The habitat on the subject lands was identified and used to further screen for potential SWH or Protected Species habitat.

### **3.4.7 Bat Habitat Assessment**

Leaf off bat habitat assessments were completed on April 10, 2019 within the subject lands where tree removal or impacts had the potential to occur. An additional assessment was completed within Thornicroft Drain in the potential crossing locations on April 6, 2023. The bat habitat assessment was completed based on the appropriate guidelines identified at the time of the survey. In 2019, this was the *Survey Protocol for Species at Risk Bats within Treed Habitats for Little Brown Myotis, Northern Myotis & Tri-Colored Bats* (MNRF 2017). In 2023, this was the *Survey Protocol for Maternity Roost Surveys (Forests/Woodlands)* (MECP 2022a) and the *Bat Survey Standards Note* (MECP 2022b).

Standing live or dead trees with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark that could provide suitable roosting habitat for bats were documented within the subject lands. Tree species, diameter at breast height (DBH), decay class according to Watt and Caceres (1999), and the number, height, and type (e.g., cavity, crevice, sloughing bark, etc.) of suitable roost sites was documented for each candidate roost tree.

### **3.4.8 Lepidoptera and Odonata**

Area searches for Odonata (dragonflies and damselflies) and Lepidoptera (butterflies) were conducted on June 11 and July 5, 2019. All species observed, numbers, and weather conditions was documented for the surveys.

### **3.4.9 General Wildlife**

All observations of birds, mammals, herpetofauna and insects were documented on all field visits. This included actual direct observations of individuals, as well as signs of wildlife presence (i.e., tracks, scats, dens, nests etc.).

## **3.5 Aquatic Habitat and Species**

### **3.5.1 Headwater Drainage Feature Assessment**

Following the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (TRCA and CVC 2014) and the Ontario Stream Assessment Protocol (OSAP) Headwater Sampling Protocol (Module S4.M11, Gorenc and Stanfield 2017), NRSI biologists conducted 3 assessments on the headwater drainage features (HDFs) that flow to the Thornicroft Drain within the subject lands. Assessments took place on April 9, June 5, and July 9, 2019. Aerial photographs were examined to identify candidate HDFs within the subject lands prior to confirming presence on site. The HDFs are shown on Map 5.

In the field, each HDF was subdivided into reaches that were identified based on changes in riparian condition, channel morphology, or tributary confluence. Each reach was given a unique identifier based on the following formula:

Stream Name (TDT)–HDF Code (#)–Reach Code (#)

The Stream Name refers to Thornicroft Drain (TDT); the HDF Code references a unique headwater number (1 to 18); and the Reach Code refers to each reach surveyed along the HDF (1 to 5).

Each HDF was assessed through 4 steps to evaluate and classify its functional importance and to identify management recommendations. Step 1 evaluates the hydrologic contribution and function of each reach; Step 2 assesses the riparian vegetation and conditions; Step 3 assesses the feature's contribution to fish and fish habitat; and Step 4 evaluates the terrestrial habitat function each reach provides. The field work included documenting information on ecological and geomorphological form and function to inform these steps. The information collected at several locations within each reach included the following:

- Bankfull width and depth;
- Wetted width and depth;
- Bank height;
- Bank angle;
- Bank material;
- Substrate composition;
- Flow velocity;
- Riparian habitat type;
- Feature vegetation; and
- Observed wildlife.

### **3.5.2 Aquatic Habitat Assessment and Temperature Monitoring**

Aquatic habitat assessments following a modified OSAP protocol were conducted on July 9 and July 10, 2019 within the Thornicroft Drain (Map 6), from Southdale Road West to Bostwick Road, as well as upstream and downstream of Wharnccliffe Road South, in order to get a fulsome understanding of the feature. The following information was recorded for each aquatic habitat segment within the subject lands, where possible:

- substrate type;

- channel depth, width, etc.;
- water temperature;
- dissolved oxygen;
- bank stability;
- aquatic vegetation cover; and
- critical life stage areas (i.e. spawning, nursery habitat, etc.).

In addition to the habitat assessments, temperature monitoring within the Thornicroft Drain was performed to further characterize the aquatic conditions within the study area and assist in the determination of sensitivity and potential habitat suitability for aquatic species. Air temperature measurements were taken as well. Surface water temperature and air temperature monitoring was completed through the instillation of continuous temperature data loggers at 3 locations, which were installed on June 5, 2019. The air temperature logger was installed beside the Thornicroft Drain within a tree. Following the removal of temperature loggers on November 6, 2019, the air and water temperature data was compared to precipitation levels recorded by Environment and Climate Change Canada monitoring station 6144478 within the City of London, in order to determine trends in surface water temperatures within the study area. The data was also analyzed following the thermal nomogram protocol for the determination of thermal regimes (Chu et al. 2009) in order to classify the thermal regime within the study area. The temperature monitoring locations are shown on Map 6.

### **3.5.3 Benthic Invertebrate Sampling**

Benthic macro-invertebrate surveys were carried out June 5, 2019 to assess the general health of the aquatic habitats within the subject lands using benthos as indicators of water quality. Two benthic macro-invertebrate sampling locations were assessed following the standard BioMap protocol in order to build on the results of the Bostwick EA (Parsons 2019). Each monitoring station (BMS on Map 6) was comprised of three samples consisting of two fixed area quantitative samples and one qualitative sample to allow for analysis through a variety of assessment metrics (Map 6). Each fixed area sample was assessed using a 0.05m<sup>2</sup> Surber sampler with each qualitative sample assessed following the *Ontario Benthos Biomonitoring Network Protocol Manual* (OBBN) Travelling Transect Kick and Sweep methodology to characterize the benthic community. Samples were preserved in a buffered 70% ethanol solution for identification in NRSI's benthic invertebrate laboratory.

### **3.5.4 Fish Community Sampling**

Fish community sampling was conducted on July 9, 2019 utilizing a Smith-Root backpack electroshocker (Model LR-24), a dip net, and an aerated portable container. Fish sampling followed the screening level assessment identified in OSAP (Stanfield 2017). Starting downstream and moving against the flow, a current was introduced into the water to temporarily paralyze fish. The sampling targeted different habitat types within the watercourse to fully assess the fish community present. Sampling occurred in two locations, at the downstream and upstream extent of the subject lands where there was a definitive break in habitat type (EMS locations shown on Map 6). All fish collected were identified, enumerated, and released live shortly after capture.

In order to sample fish using electroshocking equipment, a *License to Collect Fish for Scientific Purposes* was obtained from the MNRF. This license was issued to NRSI on June 14, 2019, by the MNRF Aylmer District Office (No. 1093402).

## 4.0 Natural Environment - Results and Discussion

### 4.1 Terrestrial Species and Habitat

#### 4.1.1 Vegetation Communities

The subject lands consist of row crop agricultural fields bisected by a watercourse that contains a mixture of forest, swamp, and marsh communities. A former residence site is present fronting onto Bostwick Road and a series of natural and cultural forest and meadow communities are present along the eastern boundary of the subject lands. A detailed description of ELC communities identified within the study area is provided in Table 4 and shown on Map 3. ELC field sheets have been included in Appendix V.

**Table 4. Vegetation Communities within the Study Area**

| ELC Code       | Community Type                                             | Community Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Forests</b> |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| FOD6-5(a)      | Fresh – Moist Sugar Maple – Hardwood Deciduous Forest Type | A small area of forest with a canopy of Sugar Maple ( <i>Acer saccharum</i> ) is present to the south of the subject lands, between two industrial yards. Given the extent of edge effect, much of the understorey is comprised of European Buckthorn. This feature contains a Category 2 Butternut (Map 7B).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| FOD6-5(b)      | Fresh – Moist Sugar Maple – Hardwood Deciduous Forest Type | <p>A large portion of the forest in the northwest extent of the subject lands, as well as the forest to the east of the subject lands is a mid-age to mature Sugar Maple Forest with American Basswood (<i>Tilia americana</i>), Bitternut Hickory (<i>Carya cordiformis</i>), Red Oak (<i>Quercus rubra</i>), American Beech (<i>Fagus grandifolia</i>), Black Cherry (<i>Prunus serotina</i>), and Hop Hornbeam (<i>Ostrya virginiana</i>) present throughout. The shrub layer of Chokecherry (<i>Prunus virginiana</i>) and limited tree regeneration is sparse and reflects a history of livestock grazing. The groundcover includes a diversity of spring ephemerals such as Yellow Dog's-tooth Violet (<i>Erythronium americanum</i>), Virginia Spring Beauty (<i>Claytonia virginica</i>), Woolly Blue Violet (<i>Viola sororia</i>), and 9 different species of sedges – high diversity for a feature of this size. Several species which are rare in Middlesex County occur within this feature, FOD6-5 (b), including Catnip Giant-hyssop (<i>Agastache nepetoides</i>).</p> <p>The Bostwick EA (Parsons 2019) did not identify wetlands within the northern woodlot, however, two Green Ash swamps (SWD2-2) were mapped and field-verified by NRSI with agency staff in 2019.</p> |
| FOD7-3         | Fresh-Moist Willow Lowland Deciduous Forest                | The watercourse within the subject lands south of the northern forest is bounded by lowland forest with a mixture of Crack Willow and Eastern Cottonwood lining the floodplain and upper banks. Manitoba Maple, Black Walnut, and Hawthorns ( <i>Crataegus</i> spp.) are common in the sub-canopy with European                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| ELC Code        | Community Type                                      | Community Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |                                                     | Buckthorn and Grey Dogwood ( <i>Cornus racemosa</i> ) forming dense stands along some parts of the feature. Due to edge effects and probable clearing in the past, the groundcover in this community is of low diversity. The EA (Parsons 2019) had identified a thicket community in the northern part of this community as mapped by NRSI. It is acknowledged that tree cover is younger and sparser in this area; however, this report treats this area as a forested community based on the contiguous canopy of tree species.                                                                                                                                                                                                                                                                                                   |
| FOD7-4          | Fresh – Moist Black Walnut Lowland Deciduous Forest | The eastern portion of the northern woodland transitions from a high diversity forest toward a lower diversity stand of Black Walnut with occasional Eastern Cottonwood and American Basswood. This area was likely cleared within the last 50 years as the Black Walnut is mid-age and very few other tree species are present. The juglone emitted from the trees has limited the establishment of groundcover to common species such as White Avens ( <i>Geum canadense</i> ), Black Raspberry ( <i>Rubus occidentalis</i> ), and Garlic Mustard ( <i>Alliaria petiolata</i> ). This ELC type is considered significant by the NHIC (MNR 2023a).                                                                                                                                                                                  |
| FOD8-1          | Fresh – Moist Poplar Deciduous Forest               | This forest community is located to the immediate north of the subject lands' boundary along the Thornicroft Drain. It is a mid-aged bottomland community, the canopy of which is dominated by Eastern Cottonwood with lower densities of Black Walnut. Black Walnut and ash species ( <i>Fraxinus spp.</i> ) are present in the sparse sub-canopy. The understory contains Black Raspberry, Glossy Buckthorn ( <i>Frangula alnus</i> ), Gray Dogwood ( <i>Cornus racemosa</i> ) and Nannyberry ( <i>Viburnum lentago</i> ). Dense groundcover is present in the community and consists of abundant Dame's Rocket ( <i>Hesperis matronalis</i> ), avens species ( <i>Geum spp.</i> ), Orchard Grass ( <i>Dactylis glomerata</i> ), Canada Goldenrod ( <i>Solidago canadensis</i> ) and Tall Goldenrod ( <i>Solidago altissima</i> ). |
| <b>Wetlands</b> |                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| MAM2-2          | Reed-canary Grass Mineral Meadow Marsh              | Marsh features dominated by Reed-canary Grass ( <i>Phalaris arundinacea</i> ) are present in 3 locations along the watercourse where tree and shrub cover is limited. Common wetland forbs including Spotted Joe-pye Weed ( <i>Eupatorium maculatum</i> ), Devil's Beggar-ticks ( <i>Bidens frondosa</i> ), Awn-fruited Sedge ( <i>Carex stipata</i> ), Blue Vervain ( <i>Verbena hastata</i> ), and American Water Horehound ( <i>Lycopus americanus</i> ) occur among the dense grass cover.                                                                                                                                                                                                                                                                                                                                       |
| SWD2-2          | Green Ash Mineral Deciduous Swamp                   | The woodland in the northwest extent of the subject lands contains 2 Green Ash ( <i>Fraxinus pennsylvanica</i> ) swamp communities that collect and convey surface water in an easterly direction toward Thornicroft Drain. Most of the Green Ash have been affected by Emerald Ash Borer ( <i>Agilus planipennis</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| ELC Code        | Community Type                 | Community Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |                                | resulting in the decline of mature trees and increased cover of herbaceous species due to the gaps in the tree canopy. The groundcover includes Fowl Meadow Grass ( <i>Glyceria striata</i> ), Sensitive Fern ( <i>Onoclea sensibilis</i> ), and Devil's Beggar-ticks. Both Cardinal-flower ( <i>Lobelia cardinalis</i> ) and Brookweed ( <i>Samolus parviflorus</i> ) occur in these wetlands and are rare in Middlesex County (Oldham 2017). An abandoned well is present at the eastern extent of the northern swamp unit.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| SWD4-1          | Willow Mineral Deciduous Swamp | A small area of swamp with a canopy of Crack Willow ( <i>Salix fragilis</i> ) is present within the riparian corridor in the centre of the subject lands. The groundcover is limited due to seasonal flooding, a recently active beaver dam and eroded channels that have formed due to high velocity flows in the spring. Small sections of the watercourse, to the north and south of the SWD4-1 community, reflect a similar structure with large Willows lining the banks and floodplain. Reed-canary Grass marsh (MAM2-2) is also present in this area where shrub cover is sparse.                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Cultural</b> |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| CUM1            | Mineral Cultural Meadow        | <p>Several areas of cultural meadow are present in the northern and eastern extent of the subject lands. These areas are associated with recently fallow fields which had been in row crop agriculture and have begun to succeed to natural habitat. The groundcover is dominated by Smooth Brome (<i>Bromus inermis</i>) with Tall Goldenrod (<i>Solidago altissima</i>), Wild Teasel (<i>Dipsacus fullonum</i>) and Tufted Vetch (<i>Vicia cracca</i>) common throughout. Willow saplings (<i>Salix amygdaloides</i> and <i>S. eriocephala</i>) have begun to establish in wetter areas with European Buckthorn (<i>Rhamnus cathartica</i>), Multiflora Rosa (<i>Rosa multiflora</i>), and Black Raspberry common along fencelines and forest edges. Topsoil stockpiles are present in 2 of the cultural meadow areas.</p> <p>A narrow strip of cultural meadow is present between the watercourse and industrial land in the southern portion of the site.</p> |
| CUS1            | Mineral Cultural Savannah      | <p>A former residential property fronting onto Bostwick Road has naturalized to a cultural savannah community. This area is identified as an Unevaluated Vegetation Patch in the London Plan (City of London 2023), although the Bostwick Road EA (Parsons 2019) identified it as significant. The discontinuous tree cover is comprised of a variety of native and non-native landscape and hedgerow trees including Black Walnut (<i>Juglans nigra</i>), Norway Spruce (<i>Picea abies</i>), Norway Maple (<i>Acer platanoides</i>) and Manitoba Maple (<i>Acer negundo</i>) with overgrown lawn dominating the groundcover. No structures are present at this location.</p> <p>An area of cultural savannah was identified further south where</p>                                                                                                                                                                                                             |

| ELC Code | Community Type      | Community Description                                                                                                                                                                                                                                                                                                                 |
|----------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                     | a HDF directs surface water flow toward Thornicroft Drain. This feature contains several large Eastern Cottonwood ( <i>Populus deltoides</i> ) and a mesic shrub and groundcover layer.                                                                                                                                               |
| CUW      | Cultural Woodland   | An area of cultural woodland is present along the east side of Thornicroft Drain, to the south of the YMCA facility (north of subject lands). This area exists as a sparse stand of Black Walnut with some meadow vegetation established among predominantly cool season grasses.                                                     |
| CUP      | Cultural Plantation | An area of cultural plantation is present to the north of the golf driving range along the eastern boundary of the subject lands. This feature is comprised of a uniform, mid-age stand of tightly row-planted Willow. This feature exhibits extremely low species diversity as a mono-culture of White Willow ( <i>Salix alba</i> ). |

#### 4.1.2 Vascular Flora

A 3-season vegetation inventory was conducted with a total of 196 species recorded by NRSI biologists. A complete list of these species is attached to this report (Appendix VI).

Groundwater indicator species were also identified within the subject lands, and are shown on Map 3. These species include Sensitive Fern (*Onoclea sensibilis*), Perfoliate Thoroughwort (*Eupatorium perfoliatum*), Spotted Joe-pye-weed, Spotted Touch-me-not (*Impatiens capensis*), and Pussy Willow (*Salix discolor*).

Background information and the Protected Species and SCC screening that was conducted in preparation of this report indicated that two significant plant species, Green Dragon (*Arisaema dracontium*) and Black Ash (*Fraxinus nigra*) are known from the study area (MNRF 2023a) (Appendix III). Surveys included concentrated effort to look for these species in suitable habitats within the subject lands; however, neither species was found.

Although none of the species identified through the background review were observed, 2 Butternut trees were observed. Butternut is listed as Endangered in Ontario (MECP 2023). One dead Butternut was documented from the Cultural Savannah (CUS1) located adjacent to Bostwick Road. As the tree is dead, it is not protected by the Endangered Species Act. A live tree is present within the Fresh-Moist Sugar Maple - Hardwood Forest (FOD6-5b) located in the southern end of the subject lands (Map 7B). A Butternut Health Assessment (BHA) was conducted on August 26, 2019 for this tree and it was determined that the tree is Category 2 (i.e. retainable). A BHA report has not yet been submitted to the Ministry of Environment, Conservation and Parks (MECP). Category 2 Butternut trees are protected under the SCA and

a zone extending to 21m from the tree is considered the species' habitat. Development within this 21m area may result in harm to the species and its ability to disperse seeds. See Section 5.5.1 for more information on the protected area around the Butternut tree.

In addition, 8 plant species considered to be regionally significant were observed within the subject lands. These are listed in Table 5 and their locations indicated on Map 7.

**Table 5. Significant Vascular Flora Observed in the Study Area**

| Common Name         | Scientific Name             | SRANK <sup>1</sup> | COSSARO <sup>2</sup> /<br>COSEWIC <sup>3</sup> | County Status <sup>4</sup> | ELC Community            |
|---------------------|-----------------------------|--------------------|------------------------------------------------|----------------------------|--------------------------|
| Brookweed           | <i>Samolus parviflorus</i>  | S4                 | -                                              | R                          | SWD2-2                   |
| Butternut           | <i>Juglans cinerea</i>      | S2?                | END/E                                          | X                          | FOD5                     |
| Catnip Giant-hyssop | <i>Agastache nepetoides</i> | S4                 | -                                              | R                          | FOD6-5 (b)               |
| Gray's Sedge        | <i>Carex grayi</i>          | S4                 | -                                              | U                          | FOD6-5 (b)               |
| Larger Straw Sedge  | <i>Carex normalis</i>       | S4                 | -                                              | R                          | CUM1                     |
| Muhlenberg's Sedge  | <i>Carex muhlenbergii</i>   | S4S5               | -                                              | R                          | FOD7-3                   |
| Spring Clearweed    | <i>Pilea fontana</i>        | S4                 | -                                              | R                          | FOD6-5 (b)               |
| Straw Sedge         | <i>Carex tenera</i>         | S5                 | -                                              | U                          | FOD6-5 (b)               |
| Virginia Stickseed  | <i>Hackelia virginiana</i>  | S5                 | -                                              | R                          | CUS1, FOD7-3, FOD6-5 (b) |

<sup>1,3</sup>MNRF 2023a, <sup>2</sup>MNRF 2023b, <sup>3</sup>Government of Canada 2023, <sup>4</sup>Oldham 1993/Oldham 2017

| LEGEND               |                  |                         |
|----------------------|------------------|-------------------------|
| SRANK                | COSARO/COSEWIC   | Middlesex County Status |
| S5 Secure            | END/E Endangered | X Native and present    |
| S4 Apparently secure |                  | U Uncommon              |
| S2 Imperiled         |                  | R Rare and native       |
| S#? Rank uncertain   |                  |                         |

#### 4.1.3 Birds

A total of 91 species are reported from the vicinity of the study area based on the OBBA (BSC 2006). The OBBA data includes those species that have been observed from within a 10 x 10km square that overlaps the study area and are known to breed in the area. A total of 56 species were documented within the subject lands during the field surveys by NRSI biologists. Refer to Appendix VII for a list of these species.

Background information and Protected Species and SCC screening indicate that 9 significant bird species are reported from within the study area (MNRF 2023a) (Appendix III). NRSI

observed 4 of these significant species during field surveys: Bald Eagle (*Haliaeetus leucocephalus*), Barn Swallow (*Hirundo rustica*), Eastern Meadowlark (*Sturnella magna*), and Eastern Wood-pewee (*Contopus virens*).

### **Migratory Birds**

A total of 24 species and an approximated count of 207 individuals were documented during the migratory bird survey. All species are common and typical of a forest and agricultural landscape. The survey generally did not document an abundance of migratory species with no warbler species recorded; however, 4 warbler species were documented on later surveys.

### **Breeding Birds**

Of the 56 bird species documented from the subject lands, 24 exhibited signs of probable breeding, such as observed pairs or birds on territory. A total of 17 species exhibited possible breeding including singing males or birds within suitable nesting habitat and 15 showed no signs of breeding within the subject lands. The highest diversity was recorded at BSS-001 from the northwestern woodland.

### **Nocturnal Birds**

Although the combination of open field and treed habitats provides suitable habitat (as well as the nearby rooftops of commercial buildings), Common Nighthawk was not documented during the nocturnal bird surveys.

### **Significant Bird Observations**

The following significant bird species were observed during 2019 field surveys.

#### *Bald Eagle*

Bald Eagle is no longer listed under the SCA or on the SARA. This species was recorded as flying over the subject lands on April 19, 2019. Regardless of the species status, suitable nesting habitat is not present within the subject lands.

#### *Barn Swallow*

Barn Swallow is listed as Special Concern by COSSARO and Threatened federally under the SARA (COSSARO 2026, Government of Canada 2026). Barn Swallows can be found in farmlands or rural areas near bodies of water and nest in buildings or other man-made structures (OMNR 2000). Barn Swallows were documented in the vicinity of

BSS-006 on June 14 and July 5. A total of 4 birds were observed foraging above the golf driving range on both dates. There was no evidence of nesting within the subject lands and it is likely that active nests are present on a rural or commercial property nearby.

#### *Eastern Meadowlark*

Eastern Meadowlark is listed as Threatened by COSSARO and Threatened federally under the SARA (COSSARO 2026, Government of Canada 2026). This species was documented at BSS-006 as a fly-over in the vicinity of the golf driving range during the May 29 survey. The cultural meadow habitats that are present within the subject lands are not large enough to support nesting for this species and as such habitat for the species is not present.

#### *Eastern Wood-Pewee*

Eastern Wood-Pewee is listed as Special Concern by COSSARO and federally under the SARA (COSSARO 2026, Government of Canada 2026). Eastern Wood-Pewee was documented on all 3 breeding bird survey dates. The species was consistently heard calling (on territory) at BSS-001 within the northwest woodland. Individuals were also noted from the vicinity of BSS-003 and BSS-004 from within the treed riparian corridor.

#### *Red-headed Woodpecker*

Red-headed Woodpecker is listed as Endangered by COSSARO and federally under the SARA (COSSARO 2026, Government of Canada 2026). As such the species and its residence are provided protection under the SARA or as SWH, if identified. Red-headed Woodpecker occupies diverse forest habitats including deciduous forests with little understorey, wooded swamps, orchards, small woodlots and forest edges. The species requires decadent trees with a DBH of at least 40 cm for nesting (MECP 2024).

During breeding bird surveys in 2020, Stantec biologists observed two Red-headed Woodpecker individuals within the forest in the northwest of the subject lands. Based on these observations, Possible breeding evidence was documented for the species. The Stantec EIS notes that potentially suitable breeding habitat is present within the woodlands on-site and to the south of the subject lands. As only Possible breeding evidence was documented by Stantec, with no additional specifics about the

observations provided it is not possible to confirm the presence of habitat for the species. Based on an observation of Possible breeding evidence, SWH for Red-headed Woodpecker has not been identified in the vicinity of the subject lands. No nests, or residences of the species were documented during field surveys. Red-headed Woodpecker is not discussed further in this report.

#### 4.1.4 Herpetofauna

A total of 26 herpetofauna species are reported from the study area or vicinity based on the ORAA and NHIC database (Ontario Nature 2019, MNRF 2023a, MECP 2023). Surveys conducted by NRSI biologists confirmed the presence of 8 species within the subject lands. A complete list of herpetofauna reported from the study area, based on background information and observations made as part of this study, is included in Appendix VIII.

Background information and the Protected Species and SCC screening indicated that 6 significant herpetofauna species are reported from within the study area (Appendix III). One of these species, Western Chorus Frog (*Pseudacris triseriata*), was documented from the subject lands by NRSI biologists during the 2019 surveys.

#### Anurans

Anuran call surveys were conducted to identify the presence of breeding frog and toad species within the subject lands. Table 6 presents the anuran call survey results.

**Table 6. Anuran Call Survey Results**

| Station | Date (2019) | Call Abundance (Number of Individuals) * |               |               |               |            |
|---------|-------------|------------------------------------------|---------------|---------------|---------------|------------|
|         |             | Western Chorus Frog                      | Spring Peeper | Gray Treefrog | American Toad | Green Frog |
| ANR-001 | April 9     | --                                       | --            | --            | --            | --         |
|         | May 16      | --                                       | --            | --            | --            | --         |
|         | June 12     | --                                       | --            | --            | --            | --         |
| ANR-002 | April 9     | --                                       | --            | --            | --            | --         |
|         | May 16      | --                                       | --            | --            | --            | --         |
|         | June 12     | --                                       | --            | 1(1)          | --            | --         |
| ANR-003 | April 9     | --                                       | 2(8)          | --            | --            | --         |
|         | May 16      | --                                       | 1(2)          | --            | --            | --         |
|         | June 12     | --                                       | --            | --            | --            | --         |
| ANR-004 | April 9     | --                                       | --            | --            | --            | --         |
|         | May 16      | --                                       | --            | 1(2)          | --            | --         |
|         | June 12     | --                                       | --            | --            | --            | --         |

| Station | Date (2019) | Call Abundance (Number of Individuals) * |               |               |               |            |
|---------|-------------|------------------------------------------|---------------|---------------|---------------|------------|
|         |             | Western Chorus Frog                      | Spring Peeper | Gray Treefrog | American Toad | Green Frog |
| ANR-005 | April 9     | --                                       | 1(2)          | --            | --            | --         |
|         | May 15      | --                                       | --            | 1(1)          | --            | --         |
|         | June 12     | --                                       | --            | --            | --            | --         |
| ANR-006 | April 9     | --                                       | --            | --            | --            | --         |
|         | May 16      | 1(2)                                     | 1(1)          | --            | --            | --         |
|         | June 12     | --                                       | --            | --            | --            | --         |
| ANR-007 | April 3     | --                                       | --            | --            | --            | --         |
|         | May 15      | --                                       | --            | --            | --            | --         |
|         | June 12     | --                                       | --            | 1(2)          | --            | --         |
| ANR-008 | April 9     | --                                       | --            | --            | --            | --         |
|         | May 16      | --                                       | 1(1)          | --            | 2(2)          | --         |
|         | June 12     | --                                       | --            | --            | --            | 1(3)       |
| ANR-009 | April 9     | --                                       | --            | --            | --            | --         |
|         | May 16      | --                                       | --            | --            | --            | --         |
|         | June 12     | --                                       | --            | 3             | --            | --         |
| ANR-010 | April 9     | --                                       | --            | --            | --            | --         |
|         | May 16      | --                                       | --            | --            | 1(1)          | --         |
|         | June 12     | --                                       | --            | --            | --            | --         |

\*Call abundance refers to the Marsh Monitoring Programs call codes (Bird Studies Canada 2009).

Evening anuran call surveys and incidental observations documented American Toad (*Anaxyrus americanus*), Gray Treefrog (*Hyla versicolor*), Northern Green Frog (*Lithobates clamitans melanota*), Spring Peeper (*Pseudacris crucifer*), and Western Chorus Frog.

Gray Treefrog was most widespread and was heard at 7 of the 10 anuran stations. Western Chorus Frog and Green Frog were restricted to the wetland and Bostwick Road ditch in the northwest extent of the subject lands. Western Chorus frog was also calling from the woodland west of Bostwick Road. Spring Peeper and American Toad were recorded at various locations within the study area including the pond on the golf driving range, the treed habitats along the eastern boundary of the subject lands, and the northern woodland/swamp.

The calling anuran data indicates that the woodland in the northwest supports a diversity of species (5). As Western Chorus Frog and Spring Peeper were noted to be calling from the woodland west of Bostwick Road, it is likely that anurans move across Bostwick Road and road mortality may be an issue. Anuran presence throughout the riparian habitat along Thornicroft Drain suggests that this feature is important for anuran movement between features (and the larger Dingman Creek watershed).

The Great Lakes / St. Lawrence – Canadian Shield population of Western Chorus Frog is considered Threatened in Canada. As such, this species is a Species of Conservation Concern. The subject lands fall within 300m of the Western Chorus Frog subpopulation divide.

## **Snakes**

Two snake species were observed within the subject lands during the 2019 surveys: Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) and Dekay's Brownsnake (*Storeria dekayi dekayi*). Data collected during coverboard surveys indicated snake presence at four of the 15 coverboards.

SNK-015, at the northern edge of the northern woodland, and SNK-005, in the cultural savannah located off Bostwick Road, each recorded a minimum of five individual snake (one Eastern Gartersnake and four Dekay's Brownsnake at each coverboard). One Dekay's Brownsnake was also documented at SNK-004. Given that many of the observations were made in late April and early May, shortly after snake emergence, and the presence of a well and foundation material near these stations, it is probable that snake hibernacula are present.

## **Turtles**

No turtles were observed during the emergence surveys focussed on the pond to the northwest of the golf driving range. A local resident noted an anecdotal observation of a Snapping Turtle (*Chelydra serpentina*) from the pond in approximately 2015.

An assessment of the sand ridges within the golf driving range did not identify any evidence of turtle nesting, however, a single Midland Painted Turtle (*Chrysemys picta marginata*) was observed in gravelly asphalt at the northwest corner of the industrial parking area. Given the suitable substrates, it is likely that this turtle was at a nest site, although no eggs were observed. During a HDF assessment in July, a dug-up turtle nest and small egg fragments from a Midland Painted Turtle were observed northwest of the industrial parking area.

Only one turtle (Midland Painted) was observed within the subject lands in 2019. Although there is evidence of some turtle presence within the subject lands, turtle populations appear to be very low.

### **4.1.5 Mammals**

A total of 47 mammal species are reported from the study area or vicinity based on the Mammal Atlas of Ontario, NHIC database, and MECP correspondence (Dobbyn 1994, MNRF 2023a,

MECP 2023). During the various field surveys, 10 of these species were observed within the subject lands. During the snake cover board checks, Meadow Vole (*Microtus pennsylvanicus*) and Deer Mouse (*Peromyscus maniculatus*) were observed under the boards. Additional mammal species documented within the subject lands during the various surveys included: Beaver (*Castor canadensis*), Coyote (*Canis latrans*), Eastern Cottontail (*Sylvilagus floridanus*), Gray Squirrel (*Sciurus carolinensis*), Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Virginia Opossum (*Didelphis virginiana*), and White-tailed Deer (*Odocoileus virginianus*). Appendix IX provides a complete list of mammal species reported from the study area.

Appendix III provides summaries of significant mammal species reported from the vicinity of the study area, their current status ranks, and preferred habitats. Based on field work conducted, none of these species are present within the subject lands. No Protected Species or SCC mammals were observed by NRSI within the subject lands.

### **Bat Habitat**

Six bat Protected Species were screened as having potential to occur within the study area: Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-colored Bat (*Perimyotis subflavus*), Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*), and Silver-haired Bat (*Lasionycteris noctivagans*). Based on the habitat observations made by NRSI staff on site in 2019 and 2023, multiple potential roosting trees for Protected Species bats were identified within the subject lands.

NRSI biologists identified 11 trees during the bat cavity tree inventory that may constitute bat roosting habitat (Map 7). These trees are located in the cultural plantation along the east boundary of the subject lands (2 trees), within the northern woodland adjacent to Bostwick Road (1 tree), within the cultural savannah fronting Bostwick Road (1 tree), as well as along the Thornicroft Drain corridor (7 trees). Confirmed bat roost habitat can constitute either Protected Species habitat and/or SWH, depending on the density of habitat trees in woodland features, which species are present and the number of bats utilizing a tree.

## **4.1.6 Lepidoptera and Odonata**

### **Butterflies**

According to the Ontario Butterfly Atlas (Macnaughton et al. 2025), 69 butterfly species are reported from the study area including 3 provincially significant species (Appendix III). NRSI

biologists observed 13 butterfly species during surveys within the subject lands including Black Swallowtail (*Papilio polyxenes*), Cabbage White (*Pieris rapae*), Common Ringlet (*Coenonympha californica*), Least Skipper (*Ancyloxypha numitor*), Monarch (*Danaus plexippus*), Northern Crescent (*Phyciodes cocyta*), Red Admiral (*Vanessa atalanta*), and Viceroy (*Limenitis archippus*). Butterfly observations were concentrated along forest and field edges and in areas of cultural meadow.

The Protected Species and SCC screening (Appendix III) provides a summary of the 3 significant butterfly species reported in the study area vicinity, their current status ranks, and preferred habitats. Monarch is considered Special Concern by COSSARO and Endangered under the SARA (COSSARO 2026, Government of Canada 2026). It was the only significant butterfly species documented from the subject lands during the 2019 surveys. As many as 3 individuals were observed at one time along field edges and in cultural meadow areas where Common Milkweed (*Asclepias syriaca*) is occasional and a variety of nectar plants, both agricultural weeds as well as asters and goldenrods, are present. Areas containing large amounts of Milkweed (*Asclepias* spp.) and nectaring plants are considered SWH. No other significant insect species were documented within the subject lands.

## **Odonates**

Information obtained from the Ontario Odonata Atlas Database (OOAD 2023) indicates that 34 species of dragonfly and damselfly are known from the study area including 5 SCC (Appendix III). During the 2019 surveys, NRSI biologists documented 6 common species from the subject lands: Common Green Darner (*Anax junius*), Common Whitetail (*Plathemis lydia*), Ebony Jewelwing (*Calopteryx maculata*), Twelve-spotted Skimmer (*Libellula pulchella*), and Widow Skimmer (*Libellula luctuosa*). As many as 10 individuals of a Forktail damselfly species were observed but could not be positively identified to species. Ebony Jewelwing, Twelve-spotted Skimmer, and Common Whitetail were relatively abundant with as many as 40 Common Whitetail observed during a single survey. Most of the odonate observations were noted in the vicinity of the watercourse and riparian habitat as well as along the edges of agricultural fields and in areas of cultural meadow.

### **4.1.7 Additional Wildlife**

During the 2019 surveys, Terrestrial Crayfish chimneys were observed along the southern edge of the northwestern woodland, in the vicinity of the Green Ash swamp community, as well as in the main area of the Green Ash swamp. These areas are indicated on Map 7. The chimneys

along the southern edge of the woodland were also documented within the Bostwick EA (Parsons 2019).

## **4.2 Aquatic Resources**

### **4.2.1 Headwater Drainage Feature Assessment**

Each segment of the 18 HDFs on site were evaluated based on the 4 assessment steps outlined in the Headwater Guideline (CVC and TRCA 2014). The Headwater Guideline provides descriptions and recommendations for each management type identified in Table 6. The management descriptions from the Headwater Guideline (CVC and TRCA 2014) are provided in Appendix X.

The results from the evaluation are summarized in Table 7. Photographs of the HDFs are included in Appendix XI. Refer to Map 5 for HDF mapping.

**Table 7. Headwater Drainage Feature Existing Conditions and Management Evaluation**

| Drainage Feature Segment | Step 1                                                                                                                                                                                                                                      |                                    | Step 2                                                                                               | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                            | HDF Guidelines Management |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                          | Hydrology                                                                                                                                                                                                                                   | Modifiers                          | Riparian                                                                                             | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                               |                           |
| TDT1-1                   | <b>Contributing Function</b><br>The feature had standing water during the 1 <sup>st</sup> site visit and was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> site visits. The feature was identified as a swale.                         | Agricultural land is tile drained. | <b>Important Function</b><br>Feature and riparian vegetation are Cultural Meadow and Meadow Marsh.   | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats.              | <b>Conservation</b>       |
| TDT1-2                   | <b>Contributing Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> site visit, and had standing water in the 2 <sup>nd</sup> visit. The feature was dry by the 3 <sup>rd</sup> visit. Site was identified as a swale. | Agricultural land is tile drained. | <b>Important Function</b><br>Feature and riparian vegetation are Cultural Savannah and Meadow Marsh. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Contributing Function</b><br>Naturalized vegetation is present within the riparian corridor. The feature may function as a stepping stone habitat for low-mobility wildlife (e.g. amphibians). | <b>Conservation</b>       |
| TDT1-3                   | <b>Contributing Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> site visit, and was dry the 2 <sup>nd</sup> and 3 <sup>rd</sup> visits. Site was                                                                   | Agricultural land is tile drained. | <b>Important Function</b><br>Feature and riparian vegetation are Cultural Savannah and Meadow Marsh. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish                               | <b>Contributing Function</b><br>Naturalized vegetation is present within the riparian corridor. The feature may function as a stepping stone                                                      | <b>Conservation</b>       |

| Drainage Feature Segment | Step 1                                                                                                                                                                                              |                                    | Step 2                                                                                                                   | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                            | HDF Guidelines Management     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                           | Modifiers                          | Riparian                                                                                                                 | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                               |                               |
|                          | identified as a swale.                                                                                                                                                                              |                                    |                                                                                                                          | habitat in Thornicroft Drain.                                                                                                                                           | habitat for low-mobility wildlife (e.g. amphibians).                                                                                                                                              |                               |
| TDT1-3A                  | <b>Limited Function</b><br>Feature was dry during all visits. Site was identified as a swale.                                                                                                       | Agricultural land is tile drained. | <b>Important Function</b><br>Riparian corridor dominated by Cultural Savana and Cultural Meadow.                         | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats.              | <b>No Management Required</b> |
| TDT1-4                   | <b>Contributing Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> site visit, was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> visits. Site was identified as a swale. | None                               | <b>Important Function</b><br>Feature and riparian vegetation are Deciduous Forest associated with the Thornicroft Drain. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Contributing Function</b><br>Naturalized vegetation is present within the riparian corridor. The feature may function as a stepping stone habitat for low-mobility wildlife (e.g. amphibians). | <b>Conservation</b>           |
| TDT2-1                   | <b>Limited Function</b><br>Feature has standing water during the 1 <sup>st</sup> site visit, was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> visits. Site was                                | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor dominated by agricultural row crop.                                         | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to                                               | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its riparian corridor, and does not                                                                           | <b>No Management Required</b> |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                 |                                    | Step 2                                                                           | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                            | HDF Guidelines Management     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                              | Modifiers                          | Riparian                                                                         | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                               |                               |
|                          | identified as a swale.                                                                                                                                                                                 |                                    |                                                                                  | downstream fish habitat in Thornicroft Drain.                                                                                                                           | provide meaningful connection to or from other habitats used by wildlife.                                                                                                                         |                               |
| TDT3-1                   | <b>Limited Function</b><br>Feature had standing water during the 1 <sup>st</sup> site visit, was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> visits. Site was identified as a swale.            | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor dominated by agricultural row crop. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its riparian corridor, and does not provide meaningful connection to or from other habitats used by wildlife. | <b>No Management Required</b> |
| TDT3-2                   | <b>Contributing Function</b><br>Feature had interstitial flow during the 1 <sup>st</sup> site visit, and was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> visits Site was identified as a swale. | Agricultural land is tile drained. | <b>Important Function</b><br>Riparian corridor has Cultural Savannah.            | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats.              | <b>Conservation</b>           |
| TDT4-1                   | <b>Limited Function</b><br>Feature had standing water during the 1 <sup>st</sup> site visit, was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> . Site was identified as a                         | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor dominated by agricultural row crop. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to                                               | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its riparian corridor, and does not                                                                           | <b>No Management Required</b> |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                                                                           |                                                                      | Step 2                                                                                      | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                             | HDF Guidelines Management |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                          | Hydrology                                                                                                                                                                                                                                                        | Modifiers                                                            | Riparian                                                                                    | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                                |                           |
|                          | swale. No connection the Thornicroft Drain.                                                                                                                                                                                                                      |                                                                      |                                                                                             | downstream fish habitat in Thornicroft Drain.                                                                                                                           | provide meaningful connection to or from other habitats used by wildlife.                                                                                                                          |                           |
| TDT5-1                   | <b>Contributing Function</b><br>The feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> site visit, was dry during the 3 <sup>rd</sup> . Site was identified as a channelized or constrained feature.                                   | Constructed outflow channel with rounded river rock and geotextile.  | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Forest.            | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Contributing Functions</b><br>Naturalized vegetation is present within the riparian corridor. The feature may function as a stepping stone habitat for low-mobility wildlife (e.g. amphibians). | <b>Conservation</b>       |
| TDT5-1A                  | <b>Contributing Function</b><br>The feature was minimally flowing during the 1 <sup>st</sup> visit and had standing water during the 2 <sup>nd</sup> site visit. The feature was dry during the 3 <sup>rd</sup> visit. Site was identified as constrained ditch. | Constructed drainage ditch. Primarily runoff from warehouse parking. | <b>Important Function</b><br>South bank riparian corridor is dominated by Deciduous Forest. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Contributing Functions</b><br>Naturalized vegetation is present within the riparian corridor. The feature may function as a stepping stone habitat for low-mobility wildlife (e.g. amphibians). | <b>Conservation</b>       |
| TDT5-2                   | <b>Contributing Function</b><br>The feature was minimally flowing                                                                                                                                                                                                | Constructed drainage ditch. Constructed ditch to catch               | <b>Valued Function</b><br>Riparian corridor is dominated by                                 | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature                                                                                             | <b>Contributing Functions</b><br>Naturalized vegetation is                                                                                                                                         | <b>Mitigation</b>         |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                                                                                                |                                                                               | Step 2                                                                           | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                             | HDF Guidelines Management     |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                                                                                                             | Modifiers                                                                     | Riparian                                                                         | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                                |                               |
|                          | during the 1 <sup>st</sup> and 2 <sup>nd</sup> site visits, was dry during the 3 <sup>rd</sup> . Site was identified as constrained ditch.                                                                                                                                            | runoff from parking area.                                                     | Cultural Meadow on the left bank.                                                | supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.                                                                             | present within the riparian corridor. The feature may function as a stepping stone habitat for low-mobility wildlife (e.g. amphibians).                                                            |                               |
| TDT6-1                   | <b>Valued Function</b><br>The feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> site visits; the feature was mostly dry during the 3 <sup>rd</sup> visit. Site was identified as a defined natural channel fed by an outlet drain of pond (drainage pipe). | Pond outlet (piped) provides the flow.                                        | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Forest. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Contributing Functions</b><br>Naturalized vegetation is present within the riparian corridor. The feature may function as a stepping stone habitat for low-mobility wildlife (e.g. amphibians). | <b>Conservation</b>           |
| TDT7-1                   | <b>Limited Function</b><br>The feature had standing water during the 1 <sup>st</sup> and 2 <sup>nd</sup> site visit and was dry 3 <sup>rd</sup> . Site was identified as a swale.                                                                                                     | Note: according to AgMaps (MAFA 2024), the area of this feature is not tiled. | <b>Valued Function</b><br>Riparian corridor dominated by meadow.                 | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats.               | <b>No Management Required</b> |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                                                  |                                    | Step 2                                                                                          | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                            | HDF Guidelines Management     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                                                               | Modifiers                          | Riparian                                                                                        | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                               |                               |
| TDT8-1                   | <b>Limited Function</b><br>The feature had standing water during the 1 <sup>st</sup> site visit, was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> . Site was identified as a swale.                                               | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor dominated by agricultural row crop.                | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its riparian corridor, and does not provide meaningful connection to or from other habitats used by wildlife. | <b>No Management Required</b> |
| TDT9-1                   | <b>Recharge Function</b><br>The reach was dry during all three visits. Site was identified as a natural channel, an ill-defined channel as evidence from past flows. This reach is identified as Significant Groundwater Recharge Area. | None                               | <b>Important Function</b><br>Riparian Corridor dominated by Deciduous Forest.                   | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats.              | <b>Maintain Recharge</b>      |
| TDT9-1A                  | <b>Limited Function</b><br>Feature was dry during all three visits. Site was identified as a swale.                                                                                                                                     | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor dominated by agricultural crops in all categories. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish                               | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its riparian corridor, and does not provide meaningful connection to or                                       | <b>No Management Required</b> |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                                                  |                                    | Step 2                                                                           | Step 3                                                                                                                                                                                                                                                                                         | Step 4                                                                                                                                                                                            | HDF Guidelines Management     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                                                               | Modifiers                          | Riparian                                                                         | Fish Habitat                                                                                                                                                                                                                                                                                   | Terrestrial Habitat                                                                                                                                                                               |                               |
|                          |                                                                                                                                                                                                                                         |                                    |                                                                                  | habitat in Thornicroft Drain.                                                                                                                                                                                                                                                                  | from other habitats used by wildlife.                                                                                                                                                             |                               |
| TDT10-1                  | <b>Recharge Function</b><br>The reach was dry during all three visits. Site was identified as a natural channel, an ill-defined channel as evidence from past flows. This reach is identified as Significant Groundwater Recharge Area. | None                               | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Forest. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. Recharge features typically do not transport any material; however, large precipitation events may transport sediment. | <b>Limited Functions</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats.             | <b>Maintain Recharge</b>      |
| TDT10-2                  | <b>Limited Function</b><br>Feature had standing water during the 1 <sup>st</sup> visit and was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> visits. Site was identified as a swale.                                               | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor dominated by agricultural row crop. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.                                                                                                                        | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its riparian corridor, and does not provide meaningful connection to or from other habitats used by wildlife. | <b>No Management Required</b> |
| TDT11-1                  | <b>Valued Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> and                                                                                                                                                  | None                               | <b>Important Function</b>                                                        | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature                                                                                                                                                                                                                    | <b>Valued Functions</b><br>Naturalized vegetation is present in the                                                                                                                               | <b>Protection</b>             |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                           |           | Step 2                                                                                    | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                                                    | HDF Guidelines Management |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                          | Hydrology                                                                                                                                                                                                        | Modifiers | Riparian                                                                                  | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                                                       |                           |
|                          | 2 <sup>nd</sup> site visits, and was surface damp by the 3 <sup>rd</sup> visit. Site was identified as a natural channel.                                                                                        |           | Riparian corridor is dominated by Deciduous Forest.                                       | supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.                                                                             | riparian corridor that connects to wetlands upstream. The feature may function as stepping stone habitat for low-mobility wildlife (e.g. amphibians).                                                                     |                           |
| TDT11-2                  | <b>Valued Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> site visits, and was surface damp by the 3 <sup>rd</sup> visit. Site was identified as a natural channel. | None      | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Forest.          | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Valued Functions</b><br>Naturalized vegetation is present in the riparian corridor that connects to wetlands upstream. The feature may function as stepping stone habitat for low-mobility wildlife (e.g. amphibians). | <b>Protection</b>         |
| TDT11-3                  | <b>Valued Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> site visits, and was surface damp by the 3 <sup>rd</sup> visit. Site was identified as a natural channel. | None      | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Swamp (wetland). | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Valued Functions</b><br>Naturalized vegetation is present in the riparian corridor that connects to wetlands upstream. The feature may function as stepping stone habitat for low-                                     | <b>Protection</b>         |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                           |           | Step 2                                                                                     | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                                                    | HDF Guidelines Management |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                          | Hydrology                                                                                                                                                                                                        | Modifiers | Riparian                                                                                   | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                                                       |                           |
|                          |                                                                                                                                                                                                                  |           |                                                                                            |                                                                                                                                                                         | mobility wildlife (e.g. amphibians).                                                                                                                                                                                      |                           |
| TDT11-4                  | <b>Valued Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> site visits, and was surface damp by the 3 <sup>rd</sup> visit. Site was identified as a wetland.         | None      | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Forest.           | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Important Functions</b><br>The feature is a wetland and a calling Spring Peepers and one Gray Treefrog were heard during second anuran call survey.                                                                    | <b>Protection</b>         |
| TDT11-5                  | <b>Valued Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> site visits, and was surface damp by the 3 <sup>rd</sup> visit. Site was identified as a natural channel. | None      | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Swamp and Forest. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Valued Functions</b><br>Naturalized vegetation is present in the riparian corridor that connects to wetlands upstream. The feature may function as stepping stone habitat for low-mobility wildlife (e.g. amphibians). | <b>Conservation</b>       |
| TDT12-1                  | <b>Contributing Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> visit, standing water during the 2 <sup>nd</sup> visit, and was surface                                                 | None      | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Forest            | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish                               | <b>Contributing Functions</b><br>Naturalized vegetation is present within the riparian corridor. The feature may function as a                                                                                            | <b>Conservation</b>       |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                             |                                    | Step 2                                                                                                                       | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                                                    | HDF Guidelines Management     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                                          | Modifiers                          | Riparian                                                                                                                     | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                                                       |                               |
|                          | damp by the 3 <sup>rd</sup> visit. Site was identified as a swale.                                                                                                                                                 |                                    |                                                                                                                              | habitat in Thornicroft Drain.                                                                                                                                           | stepping stone habitat for low-mobility wildlife (e.g. amphibians).                                                                                                                                                       |                               |
| TDT13-1                  | <b>Valued Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> visits, standing water during the 2 <sup>nd</sup> visit, and was surface damp by the 3 <sup>rd</sup> visit. | None                               | <b>Important Function</b><br>Riparian corridor is dominated by Deciduous Forest and Swamp.                                   | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Valued Functions</b><br>Naturalized vegetation is present in the riparian corridor that connects to wetlands upstream. The feature may function as stepping stone habitat for low-mobility wildlife (e.g. amphibians). | <b>Conservation</b>           |
| TDT13-1A                 | <b>Contributing Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> visit, had standing water during the 2 <sup>nd</sup> and 3 <sup>rd</sup> visits. Site was identified as a roadside ditch. | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor is dominated by row crop on the left bank and nothing (road) on the right bank. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its riparian corridor, and does not provide meaningful connection to or from other habitats used by wildlife.                         | <b>Mitigation</b>             |
| TDT14-1                  | <b>Limited Function</b><br>Feature had standing water during the 1 <sup>st</sup> site visit, was dry during                                                                                                        | Agricultural land is tile drained. | <b>Valued Function</b><br>Riparian corridor contains meadow and Deciduous Forest on the right                                | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies                                                                                    | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its                                                                                                                                   | <b>No Management Required</b> |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                                                  |                                    | Step 2                                                                                           | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                            | HDF Guidelines Management     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                                                               | Modifiers                          | Riparian                                                                                         | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                               |                               |
|                          | the 2 <sup>nd</sup> and 3 <sup>rd</sup> site visits. Site was identified as a swale.                                                                                                                                                    |                                    | bank. However, this feature is on the edge of an agricultural field.                             | allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain.                                                                                      | riparian corridor, and does not provide meaningful connection to or from other habitats used by wildlife.                                                                                         |                               |
| TDT15-1                  | <b>Limited Function</b><br>Feature was dry during all three site visits. Site was identified as a swale.                                                                                                                                | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor dominated by agricultural row crop.                 | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is not present in the feature and its riparian corridor, and does not provide meaningful connection to or from other habitats used by wildlife. | <b>No Management Required</b> |
| TDT15-2                  | <b>Recharge Function</b><br>The reach was dry during all three visits. Site was identified as a natural channel, an ill-defined channel as evidence from past flows. This reach is identified as Significant Groundwater Recharge Area. | Agricultural land is tile drained. | <b>Important Function</b><br>Riparian Corridor contains Cultural Savannah in several categories. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats.              | <b>Maintain Recharge</b>      |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                                       |                                    | Step 2                                                                                                                     | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                               | HDF Guidelines Management     |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                                                    | Modifiers                          | Riparian                                                                                                                   | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                  |                               |
| TDT16-1                  | <b>Limited Function</b><br>Feature had standing water during the 1 <sup>st</sup> site visit, and was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> visits. Site was identified as a swale.                              | Agricultural land is tile drained. | <b>Important Function</b><br>Riparian corridor contains Cultural Savannah on the left bank and row crop on the right bank. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats. | <b>No Management Required</b> |
| TDT17-1                  | <b>Important Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> visits; the feature had standing water during the 3 <sup>rd</sup> visit. Site was identified as a natural channel. | Agricultural land is tile drained. | <b>Important Function</b><br>Riparian corridor was dominated by Cultural Savannah.                                         | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats. | <b>Protection</b>             |
| TDT17-2                  | <b>Important Function</b><br>Feature was minimally flowing during the 1 <sup>st</sup> and 2 <sup>nd</sup> visits; the feature had standing water during the 3 <sup>rd</sup> visit. Site was identified                       | Agricultural land is tile drained. | <b>Important Function</b><br>Riparian corridor was dominated by Deciduous Forest.                                          | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Contributing Functions</b><br>Naturalized vegetation is present within the riparian corridor. The feature may function as a stepping stone habitat for low-                       | <b>Protection</b>             |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                  |                                    | Step 2                                                                           | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                               | HDF Guidelines Management     |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|                          | Hydrology                                                                                                                                                                                               | Modifiers                          | Riparian                                                                         | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                  |                               |
|                          | as a natural channel.                                                                                                                                                                                   |                                    |                                                                                  |                                                                                                                                                                         | mobility wildlife (e.g. amphibians).                                                                                                                                                 |                               |
| TDT18-1                  | <b>Limited Function</b><br>Feature had standing water during the 1 <sup>st</sup> visit. The feature was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> site visits. Site was identified as a swale. | Agricultural land is tile drained. | <b>Limited Function</b><br>Riparian corridor dominated by agricultural row crop. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats. | <b>No Management Required</b> |
| TDT18-1A                 | <b>Limited Function</b><br>Feature had standing water during the 1 <sup>st</sup> visit. The feature was dry during the 2 <sup>nd</sup> and 3 <sup>rd</sup> site visits. Site was identified as a swale. | Agricultural land is tile drained. | <b>Valued Function</b><br>Riparian corridor dominated by agricultural row crop.  | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Function</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats. | <b>No Management Required</b> |

| Drainage Feature Segment | Step 1                                                                                                                                                                                                                                  |                                    | Step 2                                                                        | Step 3                                                                                                                                                                  | Step 4                                                                                                                                                                                | HDF Guidelines Management |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                          | Hydrology                                                                                                                                                                                                                               | Modifiers                          | Riparian                                                                      | Fish Habitat                                                                                                                                                            | Terrestrial Habitat                                                                                                                                                                   |                           |
| TDT18-2                  | <b>Recharge Function</b><br>The reach was dry during all three visits. Site was identified as a natural channel, an ill-defined channel as evidence from past flows. This reach is identified as Significant Groundwater Recharge Area. | Agricultural land is tile drained. | <b>Important Function</b><br>Riparian corridor dominated by Deciduous Forest. | <b>Contributing Function</b><br>Direct fish habitat is not present. Feature supplies allochthonous inputs and sediment to downstream fish habitat in Thornicroft Drain. | <b>Limited Functions</b><br>Naturalized vegetation is present in the feature and its riparian corridor. However, it does not provide meaningful connection to or from other habitats. | <b>Maintain Recharge</b>  |

The classification results of the HDF assessment are summarized in Table 7, and the management recommendations for each reach are shown on Map 5. The Headwater Guideline framework utilizes the following outcomes as potential management recommendations:

- Protection – the feature serves an important function to all criteria
- Conservation – the feature serves a valued function to all criteria
- Mitigation – the feature serves a contributing function to all criteria
- Recharge protection – the feature serves a groundwater recharge function in which flow is absent over sandy or gravelly soils
- Maintain or replicate terrestrial linkage – for features with terrestrial function only
- No management required – for features with limited or no function

Descriptions of the recommended management options for each category are provided below. Modifiers in Table 7 reflect local details that alter the form, function, or importance of the feature, such as active agriculture and tiling. The management recommendations identified via strict application of the Headwater Guideline decision matrix have been adjusted to account for the modifiers and other site conditions not captured by the Guideline. The Headwater Guideline allows for these modifications through the following statement: “Classification should consider the influence of modifiers and professional judgement to determine the appropriate classification, where applicable. The results of the process need to be clearly articulated within the table” (TRCA and CVC 2014).

As shown in Table 7, the reaches within the subject property have management recommendations of ‘Protection’, ‘Conservation’, ‘Mitigation’, ‘Maintain Recharge’, and ‘No Management Required’. The Mitigation management results were largely focused on the hydrology of the features, rather than their limited ecological function.

The Headwater Guideline provides descriptions for each of these management recommendations, as directly quoted below (TRCA and CVC 2014):

- Protection – Important Functions: e.g. swamps with amphibian breeding habitat; perennial headwater drainage feature; seeps and springs; SAR habitat; permanent fish habitat with wood riparian corridor.
  - Protect and/or enhance the existing feature and its riparian zone corridor, and groundwater discharge or wetland in-situ;

- Maintain hydroperiod;
- Incorporate shallow groundwater and base flow protection techniques such as infiltration treatment;
- Use natural channel design techniques or wetland design to restore and enhance existing habitat features; if necessary, realignment not generally permitted;
- Design and locate the stormwater management system (e.g. extended detention outfalls) are to be designed and located to avoid impacts (i.e. sediment, temperature) to the feature.
- Conservation – Valued Functions: e.g. seasonal fish habitat with woody riparian cover; marshes with amphibian breeding habitat; or general amphibian habitat with woody riparian cover.
  - Maintain, relocate, and/or enhance drainage feature and its riparian zone corridor;
  - If catchment drainage has been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage), as feasible;
  - Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
  - Maintain or replace external flows,
  - Use natural channel design techniques to maintain or enhance overall productivity of the reach; and,
  - Drainage feature must connect to downstream.
- Mitigation – Contributing Functions: e.g. contributing fish habitat with meadow vegetation or limited cover.
  - Replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream;
  - Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost

- functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage); and,
  - 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).
- Recharge Protection – Recharge Functions: e.g. features with no flow with sandy or gravelly soils;
  - Maintain overall water balance by providing mitigation measure to infiltrate clean stormwater, unless the area qualifies as a Significant Recharge Areas under the Source Water Protection Act. These areas will be subject to specific policies under their respective legislation.
  - Terrestrial features may need to be assessed separately through an Environmental Impact Study to determine whether there are other terrestrial functions associated with them.
- No Management Required – Limited Functions: e.g. features with no or minimal flow; cropped land or no riparian vegetation; no fish or fish habitat; and no amphibian habitat.
  - 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.

#### **4.2.2 Benthic Invertebrate Sampling**

A total of 18 different taxa were identified across the two sampling stations within Thornicroft Drain as part of the 2019 benthic macro-invertebrate sampling. These taxa represent 11 different families and 7 orders of benthic macro-invertebrates. Survey results are summarized for stations BTH-001 and BTH-002 in Table 8 and Table 9 and discussed below.

**Table 8. 2019 Qualitative Benthic Macro-Invertebrate Metrics**

| Benthic Macro-Invertebrate Metrics  | BTH-001     | BTH-002     |
|-------------------------------------|-------------|-------------|
| <b>Diversity and Biotic Indices</b> |             |             |
| Family Biotic Index                 | 7.48        | 6.62        |
| Family Biotic Index Water Quality   | Very Poor   | Poor        |
| Biotic Index                        | 7.24        | 6.56        |
| Biotic Index Water Quality          | Fairly Poor | Fairly Poor |
| <b>Functional Feeding Groups</b>    |             |             |
| % Collector-Filter                  | 13.95       | 3.85        |
| % Collector-Gatherer                | 59.88       | 50.85       |
| % Predators                         | 18.02       | 37.61       |
| % Scrapers                          | 0.00        | 0.00        |
| % Shredders                         | 8.14        | 7.69        |

Qualitative benthic macro-invertebrate metrics (Table 8) suggest a relatively impaired watercourse dominated by a few highly tolerant species. The Hilsenhoff Biotic Index and Family Biotic Index suggests a “Very Poor” to “Fairly Poor” environmental water quality, similar to the conditions seen as part of the 2016 BioMAP water quality report completed by StraightUp Environmental Consulting (2016) as part of the Bostwick EA (Parsons 2019) where the Family Biotic Index fell within the “Fairly Poor” range suggesting substantial organic pollution and falling within the general “Potentially Impaired” assessment range. Overall, the dominant functional feeding group within both monitoring areas in 2019 were Collector-Gatherers (c-g) comprising 50.85 – 59.88% of the samples with the sub-dominant functional feeding group comprising 18.02 – 37.61% the samples.

**Table 9. 2019 Quantitative Benthic Macro-Invertebrate Metrics**

| Benthic Macro-Invertebrate Metrics  | BTH-001 | BTH-002 |
|-------------------------------------|---------|---------|
| Taxa Richness                       | 11      | 14      |
| Density (specimens/m <sup>2</sup> ) | 645.16  | 488.76  |
| <b>Sensitive Taxa</b>               |         |         |
| EPT Richness                        | 0       | 0       |
| % EPT                               | 0.00%   | 0.00%   |
| <b>Tolerant Taxa</b>                |         |         |
| % Oligochaetes                      | 0.00%   | 0.00%   |
| % Diptera                           | 98.48%  | 98.00%  |
| % Chironomidae                      | 98.48%  | 97.33%  |
| % Gastropoda                        | 0.00%   | 0.00%   |
| <b>Diversity</b>                    |         |         |
| Shannon Wiener Index                | 1.64    | 1.64    |
| Simpson's Diversity                 | 0.80    | 0.79    |

| Benthic Macro-Invertebrate Metrics | BTH-001 | BTH-002 |
|------------------------------------|---------|---------|
| BioMAP Water Quality               |         |         |
| BioMAP Water Quality               | 4.43    | 4.45    |

As seen in Table 9, taxonomic richness was relatively consistent between the two monitoring areas, showing a marked decrease from 2016 sampling, falling within the “Potentially Impaired” range at monitoring station BTH-001 and within the “Potentially Unimpaired” range at BTH-002. Both taxonomic richness and proportion of sensitive *Ephemeroptera* (Mayfly), *Plecoptera* (Stonefly), and *Trichoptera* (Caddisfly) (i.e. EPT) taxa did not indicate the presence of any sensitive taxa from Thornicroft Drain as part of 2019 benthic macro-invertebrate community sampling, suggesting a “Potentially Impaired” aquatic environment. The high proportion of tolerant taxa, *Diptera* and *Chironomidae* predominantly, further suggest “Potentially Impaired” aquatic habitat within Thornicroft Drain in the vicinity of the monitoring stations.

During the 2019 benthic sampling, the dominant and subdominant taxa were observed to be comprised of members of the highly tolerant taxa primarily members of the Family *Chironomidae* with no single group or taxa achieving true dominance within Thornicroft Drain.

Within monitoring station BTH-001:

- Dominant taxa was represented by the highly tolerant taxa *Chironomus* sp. (Tolerance 10) (Family *Chironomidae*).
- Sub-dominant taxa included the highly tolerant taxa *Natarsia* sp. (Tolerance 8) (Family *Chironomidae*)

Within monitoring station BTH-002:

- Dominant taxa was represented by the moderately tolerant taxa *Brilla* sp. (Tolerance 5) (Family *Chironomidae*).
- Sub-dominant taxa included members of the moderately tolerant *Lumbricidae* family (Tolerance 5)

The Shannon Wiener (H') Index measures diversity, taking into account the number of species and their evenness. H' Index results fall within the typical range of values of between 1.5 and 3.5 (Mac Donald 2003) for most stations. The H' Index ranged from 1.64 at BTH-001 to 2.28 at BTH-002 suggesting “Potentially Impaired” conditions within Thornicroft Drain. Simpson’s Diversity ranged from 0.79 at BTH-001 to 0.88 at BTH-002 suggesting a relatively healthy

diversity within the local benthic macro-invertebrate communities. The BioMAP water quality index resulted in a water quality index of 4.43 at monitoring station BTH-001 and 4.45 at monitoring station BTH-002 falling within the “Impaired” range for creeks (<14), which is consistent with the results seen as part of the 2016 benthic macro-invertebrate community monitoring provided in the Bostwick EA (Parsons 2019).

#### **4.2.3 Aquatic Habitat Assessment and Temperature Monitoring**

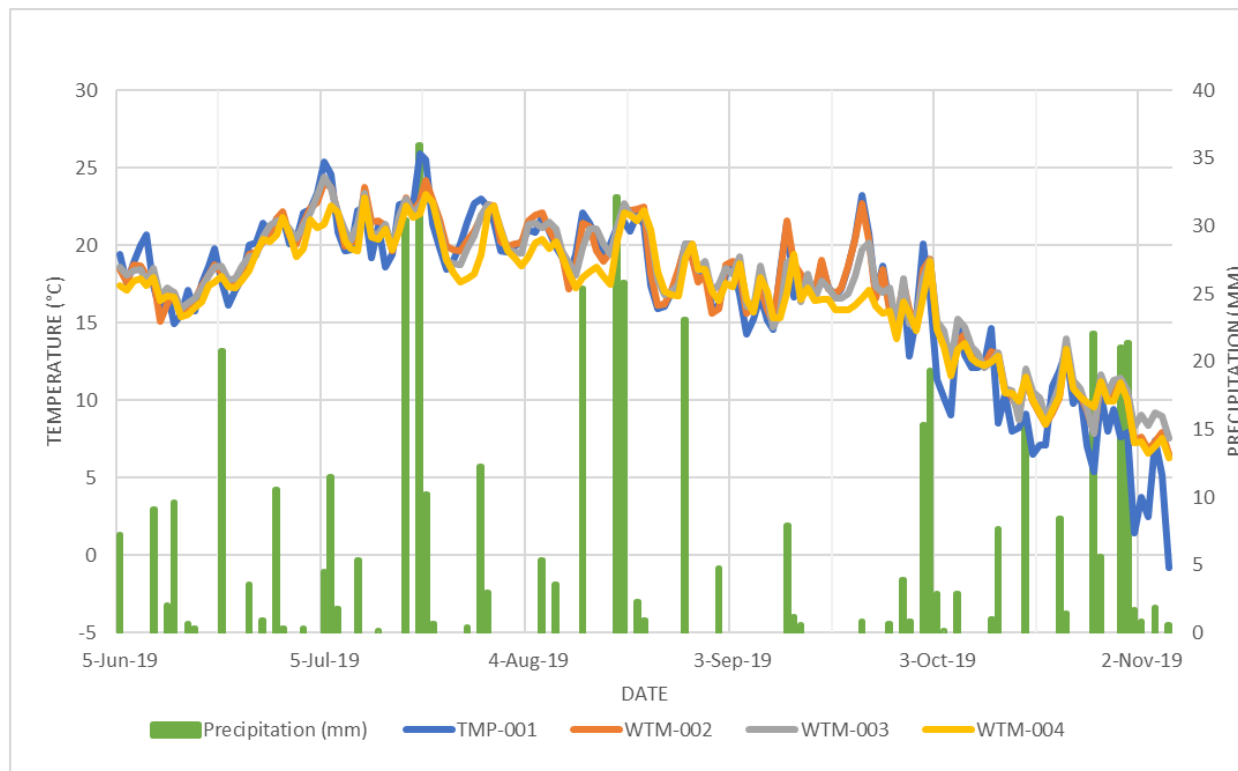
Five aquatic habitat assessments were completed along Thornicroft Drain within the study area. NRSI aquatic biologists conducted these assessments on July 9 and July 10, 2019. Within the assessed sites (Map 6), Thornicroft Drain is consistently wetted with depths up to 150cm. The drain originates north of the property from a storm sewer, which during high flow events provides a significant amount of flow/velocity to the watercourse downstream. It flows southward through a naturalized channel for the full extent of the subject lands. Downstream of Southdale Road, the channel has historically been straightened. The channel has a relatively straight meander with a significant number of headwater inputs throughout its length. The feature contains riffles, runs, and pools which act as refuge to fish during dry periods.

Throughout the watercourse there are areas of significant erosion and steep banks denoting a significant quantity of water that is carried seasonally. The substrates range from silt to gravels but are predominantly silt and sand, with large deposits of silt in various locations. There were several debris jams at the time of assessment consisting of woody debris. One of the debris jams, which may have been a Beaver dam at one point, has changed the habitat upstream. A larger quantity of fine sediments is being held back, and the watercourse was wider upstream of this location. The riparian corridor provides a great amount of shading to the watercourse. The low-lying areas around Thornicroft Drain show evidence of high flows, with debris littered up to the edge of the floodplain.

NRSI’s aquatic habitat assessment followed the same reaches where possible as outlined within the Bostwick EA (Parsons 2019). Our findings also matched the existing conditions as documented within the Bostwick EA (Parsons 2019).

The results of 2019 Thornicroft Drain water temperature and air temperature monitoring shows a relatively consistent pattern of surface water temperatures across all monitoring stations (Figure 1), with characteristic variation in water temperatures associated with significant precipitation events. However, variation with water temperatures lacked a strong correlation to

precipitation events (Correlation coefficients  $<0.1$ ). As such, it is expected that the water temperatures are more reflective of thermal influences from daily air temperatures (Correlation coefficients  $>0.9$ ) with slight influences as a result of inputs from surface water run-off.



**Figure 1. 2019 Surface Water Temperature Monitoring Thornicroft Drain**

Baseline thermal regime determination suggests that the thermal regime within Thornicroft Drain falls within the “Warm-Cool” water thermal regime. This determination is in line with the “warm” designation in the Dingman Creek Subwatershed Study Update (Delcan Corporation 2005), the “cool” designation in the Bostwick EA (Parsons 2019) and the “warm-cool” designation in the Dingman Creek Subwatershed Stormwater Study (Aquafor Beech 2020). NRSI’s thermal analysis of the temperature data collected during this study indicates that Thornicroft Drain is characteristic of a cool to cool-warmwater thermal regime based on Chue et al. (2009). Minor variances were recorded between monitoring stations, with WTM-004 representing the lowest average water temperatures recorded within Thornicroft Drain (Figure 4). On average, variation

between WTM-002 (

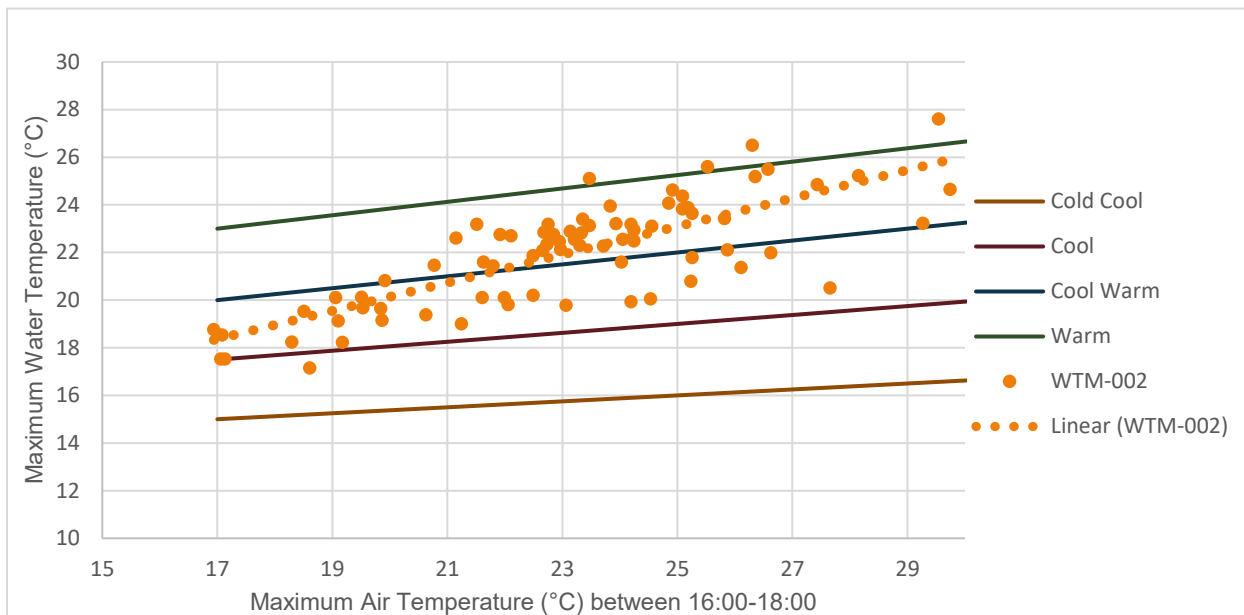
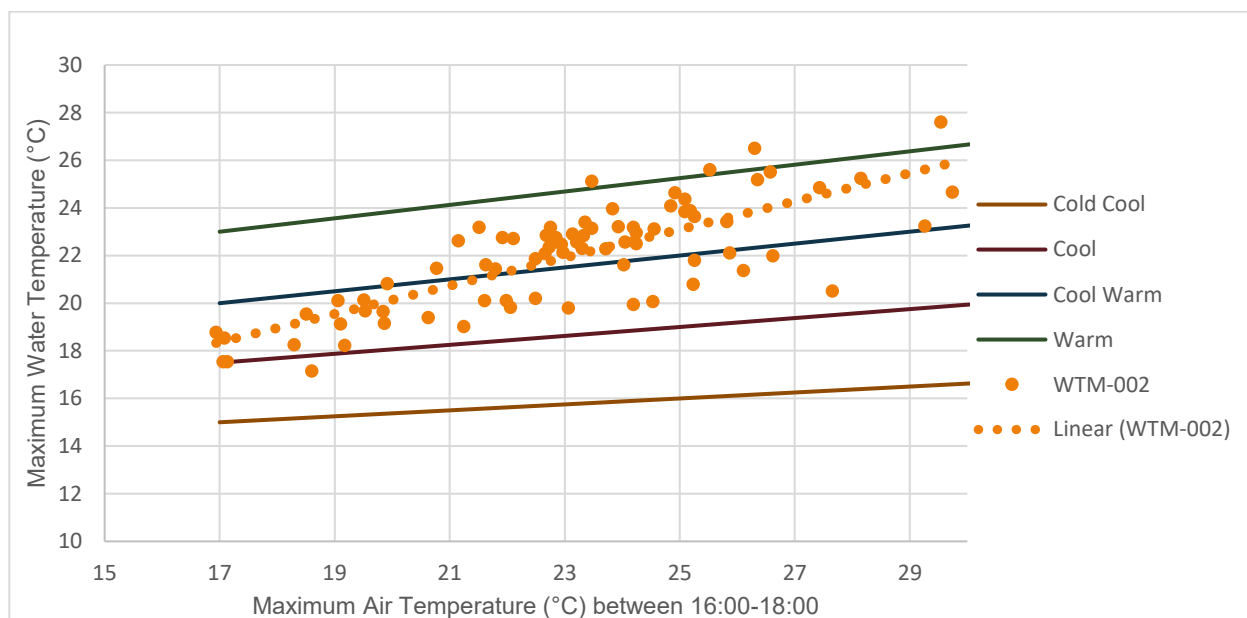
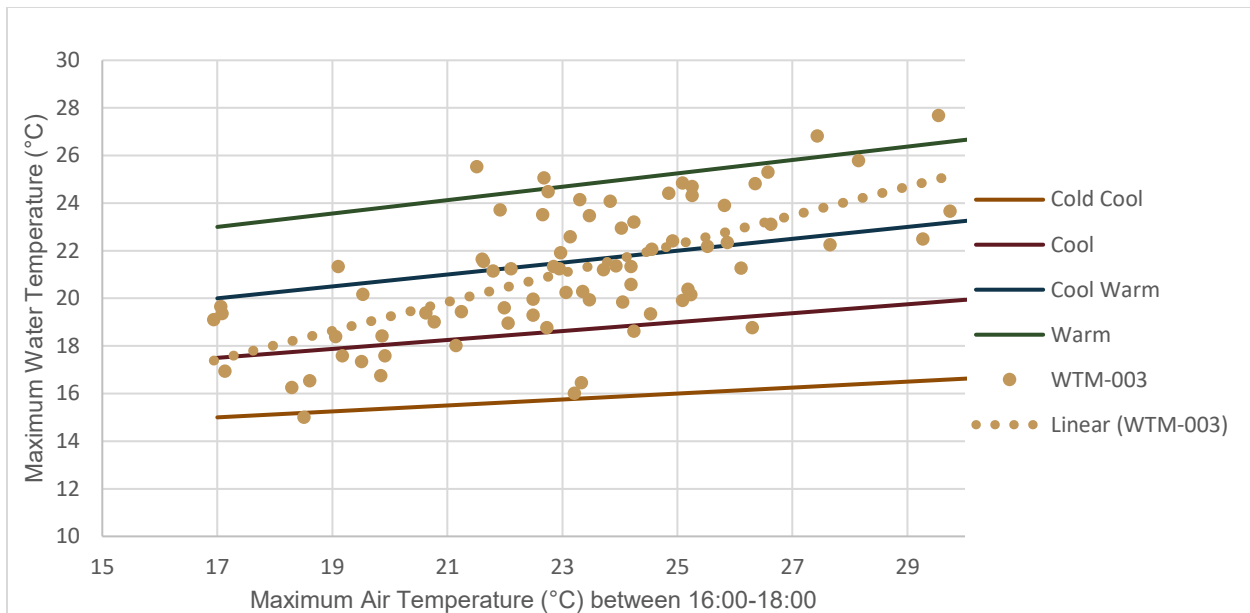


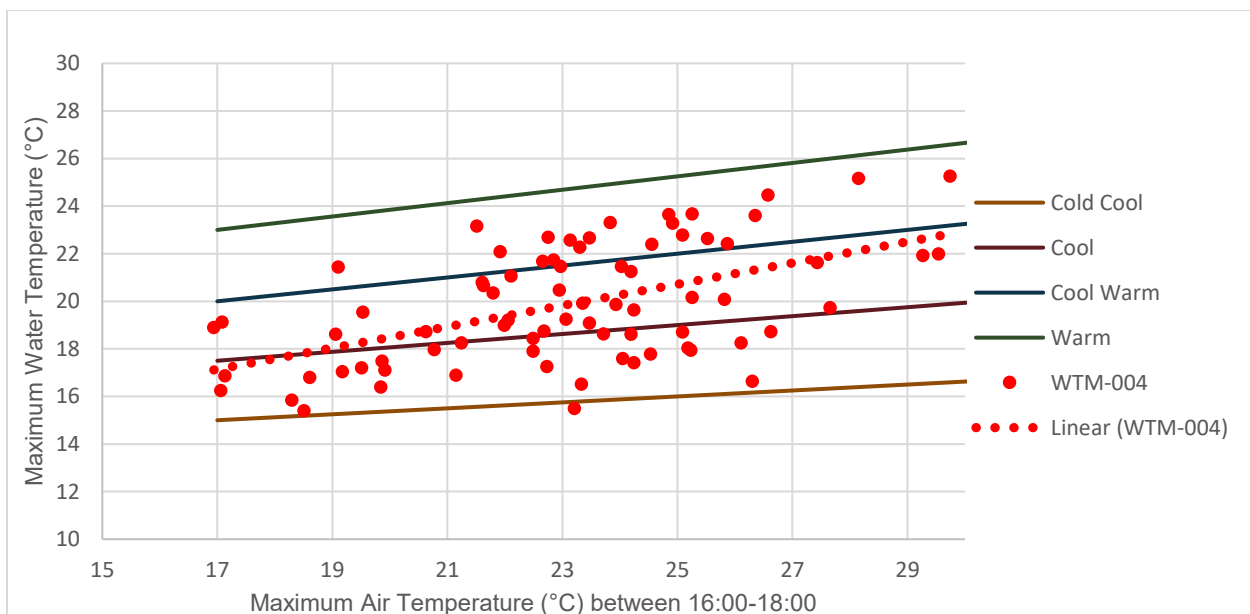
Figure 2) and WTM-003 (Figure 3) varied by less than 1°C, while WTM-004 was approximately 1-2°C colder than WTM-002 and WTM-003 on average.



**Figure 2. WTM-002 Thermal Regime Monitoring**



**Figure 3. WTM-003 Thermal Regime Monitoring**



**Figure 4. WTM-004 Thermal Regime Monitoring**

#### 4.2.4 Fish Community Sampling

*The Canadian Fisheries Act, 1985*, defines “fish” as including: a) parts of a fish; b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals; and c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals. As such, fish, mussels, and Terrestrial Crayfish are discussed in this section.

Within Thornicroft Drain, eight species of fish were collected during the sampling from the downstream extent (EMS-001) and two species of fish were collected from the upstream extent (EMS-002) within the subject area. The species from EMS-001 included adult or juvenile and young-of-year Blacknose Dace (*Rhinichtys obtusus*), Bluntnose Minnow (*Pimephales notatus*), Brook Stickleback (*Culea inconstans*), Central Stoneroller (*Campostoma anomalum*), Creek Chub (*Semotilus atromaculatus*), Fathead Minnow (*Pimephales promelas*), Pumpkinseed (*Lepomis gibbosus*), and White Sucker (*Catostomus commersonii*). Species from EMS-002 included Brook Stickleback and Creek Chub.

The species collected are representative of a cool to warmwater fish community. This is similar to the results from the Bostwick EA (Parsons 2019) and the UTRCA's statements within the Dingman Creek Subwatershed Study (Delcan Corporation 2005). The only species reported from the area not captured during NRSI's 2019 sampling is Iowa Darter (*Etheostoma exile*).

Although not sampled, fish were observed immediately downstream of Southdale Road, as well as downstream of the subject lands at the Wharncliffe Road crossing. No freshwater mussels were observed within Thornicroft Drain, and no fish or mussels were observed within the HDFs.

## 5.0 Evaluation of Significance

An analysis of the significance and sensitivity of natural features within the subject lands was completed in order to identify those features and habitats that are sensitive to disturbance. This analysis is based on the rarity or significance of features and/or associated functions/processes and/or current policies, legislation, or planning related studies. Such features and functions identified as sensitive to disturbance are further identified as ‘constraints’ to development, prohibiting or constraining aspects of any proposed development around or within them. These features are discussed in the context of natural heritage policies that govern their protection. Conversely, opportunities for development may occur outside of these natural environment constraints within the subject lands. Results of this analysis have been provided as input to the proposed development plan in order to avoid and reduce impacts to natural features and functions. Each natural heritage constraint is shown on Map 7. A summary of this analysis for the study area is discussed below.

### 5.1 Wetlands

Wetlands are important for many reasons, including collecting and storing surface water and groundwater and providing habitat for plants, wildlife, and fish. Wetlands operate on a water budget, where the hydrologic character of the wetland is determined by the combination of water inflow/outflow, topography, and groundwater conditions (Mitsch and Gosselink 2000). Wetlands receive water through precipitation, surface inflow, groundwater discharge; and lose water through evapotranspiration, surface water outflow, and groundwater recharge.

According to the background information collected, the North Talbot Wetlands (UT57) Provincially Significant Wetland complex is located approximately 900m to the west of the subject lands (MNRF 2023a). The wetland features identified within the subject lands have not been evaluated. The wetland features within the subject lands include the following communities:

- SWD2-2 (northern portion of FOD6-5): 0.737ha
- SWD2-2 (southern portion of FOD6-5): 0.338ha
- MAM2-2/SWD4-1: 0.317ha
- MAM2-2 (east): 0.026ha
- MAM2-2 (west): 0.176ha

Based on the size of wetland units and lack of significant features, the wetlands within the subject lands would not be considered provincially significant.

Vegetation community mapping completed by NRSI biologists in 2019 identified five wetland units (Map 3), including two swamps within the northwestern woodland and small marsh and swamp features along Thornicroft Drain. As provided in the London Plan (2023), all wetland features, regardless of their size or designation, are subject to the Natural Heritage System policies and are protected (City of London 2023). EXP completed an assessment of hydroperiod within each of the wetland areas on the subject lands, the wetland areas are divided into the wetlands within the northern woodland, the central wetland located along the Thornicroft Drain, and the wetlands located along the tributary (TDT1) to Thornicroft Drain at the southern end of the subject lands. The results of the wetland hydroperiod assessment area summarized for each wetland area below.

The two Green Ash Swamp (SWD2-2) features in the northwest portion of the subject lands are located within the woodland. The wetland near the northern forest edge receives surface water from the west side of Bostwick Road, as well as intermittent flow from the wetland near the southern edge of the forest, through a poorly defined swale that connects the two wetlands. These wetlands direct surface water east into Thornicroft Drain (see Map 5 for flow paths). Anuran call surveys documented both Spring Peeper and Western Chorus Frog from the northern wetland with no anurans calling from the southern wetland unit. These wetlands and the adjacent upland forest habitat are relatively intact with limited signs of disturbance and a relatively high diversity of native plants, including several regionally significant species. These wetlands begin retaining water in the fall and winter and reach peak surface water levels in the late winter to early spring before drying up in the summer. Based on these findings the wetlands are fed by seasonal groundwater discharge and runoff, with no significant sustained year-round ponded water (EXP 2024). Given the quality of these wetlands and their proximity to future development (including the Bradley Avenue extension), both are considered sensitive to development-related impacts.

Along Thornicroft Drain, Reed-canary Grass Marsh (MAM2-2) and Willow Swamp (SWD4-1) inclusion communities are present in low-lying sections and subjected to seasonal flooding (Map 3). In comparison to the wetlands in the northwest of the subject lands, these features have a lower diversity and are less suitable for anuran breeding, as standing water is limited. Although these wetlands are small, ranging from approximately 0.05ha to 0.25ha, all of the units collect surface water flow and serve to collect floodwater during spring melt and significant rainfall events. These wetlands are all subject to edge effects from adjacent agricultural activities and are generally seen as lower quality than the wetlands in the northwest of the subject lands. The

wetlands show signs of disturbance, such as invasive shrub establishment and one unit was likely cleared for agriculture in the last 25-50 years, and as a result these features are less sensitive. The central MAM2-2/SWD4-1 feature has no sustained year-round ponded water, as per the assessment completed by EXP (2024). The two small MAM2-2 features at the south of the subject lands also contained no sustained year-round pond water (EXP 2024). The requirement for natural feature buffers (wetland, valleyland, dripline, watercourse) will present an opportunity for naturalization and enhancement adjacent to these wetlands.

Due to the small size of the wetlands and buffer discussions with the City of London Ecologist, wetlands within the subject lands were not formally assessed through the Ontario Wetland Evaluation System (MNRF 2022). The OWES indicates that a minimum size of 0.5ha is required to complete an evaluation, unless the feature is considered a specialized wetland, as per OWES manual Section 1.2.2 (MNRF 2022). The wetlands on site are therefore considered through OWES guidelines to be non-significant and are treated as Wetlands in accordance with the London Plan (2026).

Wetland compensation from 3080 Bostwick Road is being addressed within the subject lands. As described within the 3080 Bostwick Road EIS 2022 Addendum #2 (Stantec 2022), a small meadow marsh of 0.2ha, which is dominated by highly invasive Common Reed, is being removed and compensated for within the southern area of the subject lands, as shown on Map 8. The wetland removal and compensation will require approval under Section 28 of the Conservation Authorities Act Regulations. Wetland compensation for the subject lands is further discussed below.

Development or site alteration on lands adjacent to the wetlands is not permitted under the PPS or the London Plan unless it has been demonstrated that there will be no negative impacts on the natural feature or its ecological functions (OMMAH 2020, London Plan 2026).

## **5.2 Significant Woodlands**

The London Plan (2026) recognizes significant woodlands, which are indicated on Natural Heritage Map 5 of the London Plan. The woodland in the northwest portion of the subject lands is considered a Significant Woodland (Patch 10064). The entire treed area along the Thornicroft Drain that is contiguous with this woodland is also treated as significant within this report and in the Bostwick EA (Parsons 2019). Although this feature is excluded on Map 5 of The London Plan, the presence of a hydrological feature within the treed area, as well as the

contiguous tree cover with Patch #10064, fulfills the criteria for significance in accordance with the City's EMG (2007, 2025).

In accordance with the PPS and the London Plan, development and site alteration within a Significant Woodland is prohibited unless it can be demonstrated that there will be no negative impacts to the natural feature or its ecological functions (OMMAH 2020, London Plan 2026).

The Cultural Savannah (CUS1) that fronts onto Bostwick Road, as well as the Sugar Maple-hardwood Forest (FOD6-5) to the immediate east of the subject lands are indicated on Map 5 of the London Plan as Unevaluated Vegetation Patches. The London Plan states:

*“A woodland will be considered significant if it achieves a minimum of one High or five Medium criteria scores as determined by application of the City Council approved Guidelines for the Evaluation of Ecologically Significant Woodlands.”*

Appendix XII provides the evaluation of each feature under guideline Section 4 of the EMG for the determination of Significant Woodlands (City of London 2025). Based on the strict application of this evaluation, the Cultural Savannahs identified within the subject lands meet the criteria for Significant Woodland under Section 1.1 and 1.2 of the guidelines. The Sugar Maple-Hardwood Forest (Patch 10065) to the east of the subject lands and west of the hydro corridor does not meet the criteria for Significant Woodland, although it was only assessed from the property line. The Cultural Plantation along the eastern edge of the subject lands was not evaluated as it had been identified by the City ecologist that this feature was able to be removed, and as such is not significant. Significant Woodlands are shown on Map 7. The evaluation of these features generally matches the information/assessment within the Bostwick EA (Parson 2019).

The Cultural Savannah adjacent to Bostwick Road and at the south end of the subject lands are not shown as a Significant Woodland on Map 5, as further discussions on the significance of the overall polygon as a woodland, versus significance of the HDF and Thornicroft Drain is given additional consideration in this EIS.

Under the PPS (2020) the definition of woodland is:

*“means treed area that provide environmental and economic benefits to both the private landowner and the general public, such as erosion protection, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products.*

*Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels. Woodlands may be delineated according to the Forestry Act definitions or the Province's Ecological Land Classification system definition for "forest".*

Significant in regards to woodlands, under the PPS (2020) means:

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

Under the Ecological Land Classification Manual (Lee et al. 1998), woodland is defined as:

*"a treed community with 35 to 60% cover of coniferous or deciduous trees."*

A CUS is defined:

*"as a community where tree cover is between 25 to 35% and where vegetation is stratified with scattered or patches of open grown trees, and groundcover dominated by grasses and herbs."*

Further under the Forestry Act (1990), a woodland means land with at least:

- (a) 1,000 trees, of any size, per hectare,*
- (b) 750 trees, measuring over five centimetres in diameter, per hectare,*
- (c) 500 trees, measuring over 12 centimetres in diameter, per hectare, or*
- (d) 250 trees, measuring over 20 centimetres in diameter, per hectare*

Under the PPS, the CUS would not be considered to be a Significant Woodland. Further, the CUS would not be considered a woodland community under the ELC (Lee et al. 1998) or (the Forestry Act (1990)). A tree density assessment within the CUS was not completed due to the low density of trees evident during site visits. Vegetation within the CUS1 community on the subject lands is stratified with scattered patches of trees, and groundcover within this community is dominated by grasses and herbaceous species. As noted, the CUS1 adjacent to Bostwick Road was the site of a former homestead and so its origins are a landscaped yard.

In accordance with the PPS and the London Plan, development and site alteration within a Significant Woodland is prohibited unless it can be demonstrated that there will be no negative impacts to the natural feature or its ecological functions (OMMAH 2020, London Plan 2026).

### **5.3 Significant Valleyland**

The London Plan (2026) identifies the full length of Thornicroft Drain within the subject lands as a Significant Valleyland (Map 5 of the London Plan). Significant Valleyland is identified as having a minimum width of 30m on each side of the watercourse, measured from the high-water mark, as is shown on Map 7.

Valleylands are also shown within the London Plan on Map 5 (Natural Heritage), although field work confirmed there are no Valleylands within the subject lands, other than the Significant Valleyland along Thornicroft Drain.

Matrix modelled the 250 year floodplain a floodplain alteration and storage assessment for the subject lands (Matrix 2022). In certain areas the floodplain was modified to provide for a better development plan, but a consistent amount of “volumetric compensation” floodplain area was added, for a no net loss of floodplain volume or area. The revised floodplain modelled by Matrix is shown on Map 8.

In accordance with the PPS and the London Plan, development and site alteration within a Significant Valleyland is prohibited unless it can be demonstrated that there will be no negative impacts to the natural feature or its ecological functions (OMMAH 2020, London Plan 2026).

### **5.4 Significant Wildlife Habitat**

The Significant Wildlife Habitat Technical Guide (SWHTG) outlines the types of habitats that the MNRF considers significant in Ontario, as well as criteria to identify these habitats (OMNR 2000 and 2010). Each of these broad categories is discussed further in the following sections. Refer to the SWH screening table (Appendix IV) for an analysis of each SWH type assessed within the subject lands.

Based on background information review, desktop analysis, and field studies, four SWH types were confirmed within the subject lands with two additional SWH types identified as candidate. These are shown on Map 7.

During the 2016-2017 field surveys for the Bostwick EA (Parsons 2019), Specialized Wildlife Habitat for amphibian breeding, both wetland and woodland, was identified within the woodland to the northeast of the subject lands boundary (Patch 10065), although it appears that surveys were conducted only adjacent to the pond located east of the woodland. As a result,

identification of this SWH may not be accurate. Surveys conducted by NRSI in 2019 did not document sufficient anuran activity in this feature to warrant SWH designation.

Development or site alteration within SWH is not permitted under the PPS or the London Plan unless it has been demonstrated that there will be no negative impacts on the habitat or its ecological functions (OMMAH 2020, London Plan 2023).

#### **5.4.1 Seasonal Concentration Areas**

Wildlife seasonal concentration areas are defined as areas where animals occur in relatively high densities for all, or portions, or their life cycle (OMNR 2000). These areas are generally small in size, particularly when compared to areas used by these species during other times of the year.

#### **Bat Maternity Colonies (Candidate)**

Candidate Bat Maternity Colonies SWH is identified where >10/ha large-diameter trees (>25cm DBH) occur within mature deciduous or mixed forest stands (FOD, FOM, SWD, SWM). This SWH is evaluated based on the confirmed presence of maternity colonies consisting of >10 Big Brown Bats (MNRF 2015). Bat maternity (or nursery) colonies are day roosts inhabited solely by females and juveniles/sub-adults and are used for giving birth and raising young (OMNR 2011). Colonies can range in size from tens to hundreds of adult females and their young and some species form individual maternal roosts (OMNR 2011). Maternity colonies can be located in human structures (e.g., barns and attics), in tree cracks and hollows, and under loose tree bark.

Guidelines for identifying candidate significant bat maternity colony are outlined by the MNRF (2015, 2021) and the SWHTG (OMNR 2000). These documents outline that any deciduous or mixed forest communities should be assessed for cavity trees  $\geq 25\text{cm}$  DBH which may be suitable for roosting bats.

Cavity assessments were completed in areas where tree removals or potential impacts to trees may occur in 2019. In 2023, an additional survey was completed for the crossing areas of Thornicroft Drain. Trees which may provide suitable habitat are present at several locations within the subject lands (Map 7). As passive acoustic monitoring studies do not provide the data required to confirm the presence of roosting habitat, the FO6-5, FOD7-3, and FOD7-4

communities (as well as the associated SWD2-2 and SWD4-1 inclusions) are considered candidate SWH for Bat Maternity Colonies within the subject lands.

### **Reptile Hibernaculum (Candidate)**

Reptile hibernacula sites can include foundations, wells, and bridge abutments where reptiles can access sub-terranean crevices for over-wintering. Congregations of snakes emerge from hibernacula in the early spring and are typically found basking in close proximity to the feature for a period following emergence. Snake hibernaculum habitat can be found in any ecosite type as long as suitable features are present below the frost line (OMNR 2000).

Observations of several individuals of two snake species were documented from the snake boards along the edge of the northwest woodland, as well as in the vicinity of a former residence in the cultural savannah (CUS1) adjacent to Bostwick Road. An abandoned well and foundation, both of which appear to extend below the frost line, are present in these areas respectively. Given the observation of numerous snakes in late April, shortly after emergence, it is very likely that these features are being used to over-winter and therefore SWH is probable.

Hibernacula sites are considered SWH and SWH includes the feature plus a 30m buffer surrounding the feature (in this case the abandoned well which is located in the core of the large forest, and the house foundation located along the west side of the CUS1 community), see Map 7.

### **5.4.2 Rare Vegetation Communities (Confirmed)**

The Fresh – Moist Black Walnut Lowland Deciduous Forest (FOD7-4) community that comprises a portion of the northern woodland is considered significant by the NHIC (MNRF 2023a). This community is bisected by the Thorncroft Drain Significant Valleyland.

### **5.4.3 Specialized Wildlife Habitat**

No Specialized Wildlife habitat types, which could include Turtle Nesting Areas or Amphibian Breeding Habitat, were documented from the subject lands.

### **5.4.4 Habitat for Species of Conservation Concern**

SCC are quite rare or have experienced significant population declines in Ontario. For SCC habitat to qualify as SWH it needs to be easily mapped and cover an important life stage component for the species (MNRF 2015). Based on the results of wildlife-specific field surveys,

Terrestrial Crayfish, and Special Concern and Rare Wildlife Species (Eastern Wood-Pewee) SWH were confirmed within the subject lands.

#### **Eastern Wood-Pewee (Confirmed)**

Habitat for Eastern Wood-Pewee includes the northwestern woodland, as well as the forested riparian corridor along Thornicroft Drain. Eastern Wood-Pewee will use both forest core areas of various sizes and forest edge habitat for nesting and show some fidelity to riparian habitats. The extent of SWH encompasses those treed areas which are likely to support breeding pairs. These areas are defined by the extent of the ELC polygon and are indicated on Map 7

#### **Western Chorus Frog (Confirmed)**

Habitat for Western Chorus Frog has been identified within the northern most SWD2-2 community within the northwestern FOD6-5 woodland. The Great Lakes / St. Lawrence – Canadian Shield Population of Western Chorus Frogs is federally Threatened. This species breeds in a variety of wetland habitats including temporary ponds, swamps and wet meadows (OMNR 2000). Habitat for Western Chorus Frog within the subject lands includes this important breeding habitat, the extent of the species habitat is shown on Map 7.

#### **Terrestrial Crayfish (Confirmed)**

Both areas of the Green Ash Swamp (SWD2-2) in the northwest portion of the subject lands contain Terrestrial Crayfish chimneys which constitute confirmed SWH. This SWH type often occurs in tilled agricultural fields or areas that undergo seasonal water inundation.

### **5.4.5 Animal Movement Corridors**

As surveys conducted in 2019 did not identify SWH for anuran breeding (wetland), the criteria for the Animal Movement Corridors SWH type was not fulfilled.

## **5.5 Habitat of Endangered and Threatened Species**

Based on the background review and field investigations, one Protected Species, Butternut, was confirmed within the subject lands. Habitat for Protected Species bats is likely present, but acoustic bat surveys were not undertaken in order to confirm species presence.

### **5.5.1 Butternut**

Butternut is listed as Endangered both provincially and federally (SCA 2025, Government of Canada 2026). Butternut is a member of the walnut family and is native to, and widespread in

eastern Canada. The species is listed as Endangered due to rapid population declines occurring as the result of a fungus called Butternut Canker (*Sirococcus clavigignenti-juglandacearum*). Butternut receives habitat protection under the SCA (2025). The most current habitat description for Protected Species plants identifies that the regulated habitat area consists of the relevant species' maximum DBH multiplied by 18 and rounded up the nearest metre. The maximum DBH for Butternut is 116cm, according to the provincial Recovery Strategy for the species (Poisson and Ursic 2013). Using this DBH measurement, the area of regulated habitat around a Butternut is 21m ( $18 \times 1.16 = 20.88$ ). A Root Harm Prevention Zone (RHPZ) is identified based on the DBH of the Butternut. In this case, the Butternut within the subject lands has a DBH of 39cm. For trees with a DBH between 30cm and 50cm an RHPZ of 18m is applied. Additionally, a 5m buffer is applied to the RHPZ to ensure no impact to the Butternut.

Confirmed habitat for Butternut exists within the subject lands, based on the observation of a single Butternut in the southernmost FOD6-5 community. A Butternut Health Assessment was completed for the documented individual and summarized in a Butternut Health Assessment report which is to be submitted to the MECP 30 days prior to the start of proposed work on the subject lands. The results of the Butternut Health Assessment are considered final 30 days following the submission of the report to MECP.

Through the completion of the Butternut Health Assessment, the Butternut was determined to be a Category 2 tree (retainable). Genetic testing of the Category 2 Butternut was not undertaken. The location of the Butternut and its habitat, 18m RHPZ and associated 5m buffer are shown on Map 7.

The Butternut on the subject lands is located in the vicinity of Block 87, for which an Environmental Management Plan (EMP) was prepared by NRSI in January 2026 (NRSI 2026b). This EMP identifies that *"neither the regulated habitat area nor the RHPZ area and its buffer will overlap the proposed area of grading. The Butternut 25m area is overlapped slightly; however, this area is only relevant if impacts are identified for the Butternut and an exemption is sought under O.Reg. 830/21. Since the Butternut on the subject lands will not be destroyed or harmed, nor will its habitat be destroyed, no impacts are anticipated for the tree, and it does not need to be addressed under the ESA. Tree protection fencing has been recommended for installation along the grading limited to provide protection to the Butternut and other retained trees during*

*the construction process. In the interest of completeness, a comprehensive BHA will be completed for the tree during the leaf-on season in 2026."*

It is recommended that an updated Butternut Health Assessment be completed for the Butternut that is present on the subject lands at the focused design study stage to confirm that it is still a Category 2 tree. As this tree's 21m habitat zone is located entirely within a forest community that will be retained, no impacts to the tree or its habitat are anticipated. As a result, it is not anticipated that registration under the SCA will be required.

### **5.5.2 Protected Species Bats**

Suitable roosting habitat for Little Brown Myotis, Northern Myotis, Tri-colored Bat, Silver-haired Bat, Hoary Bat, and Eastern Red Bat is present within the subject lands. Little Brown Myotis uses caves, quarries, tunnels, hollow trees, or buildings for roosting, and it feeds primarily in wetlands and forest edges (OMNR 2000). Northern Myotis roosts in houses and man-made structures, but prefers hollow trees or under loose bark, and it hunts within forests below the canopy (OMNR 2000). Tri-colored Bat prefers open woods near water; it roosts in trees, cliff crevices, buildings, or caves (OMNR 2000). Silver-haired Bat primarily roosts under exfoliating bark and in cavities of trees. This species will use both deciduous and coniferous forests and may occasionally roost in anthropogenic structures (COSEWIC 2023). Hoary Bat and Eastern Red Bat typically roost in the foliage of trees and will use both coniferous and deciduous habitats (COSEWIC 2023).

Based on guidance for treed habitats and areas (MECP 2022b), surveys for Protected Species bats are not needed if a proposed activity will avoid impairing or eliminating the function of habitat for supporting bat like processes, i.e. 1) if a proportionally small number of potential roost trees in treed habitats are to be removed and their removal will not result in fragmentation of habitat or barriers to habitat use by bats, and 2) if the timing of tree removal will avoid the bat active season (April 1 to September 30 in southern Ontario). The damage and destruction assessment varies geographically as the availability of other nearby maternity and day roost trees differs across the province of Ontario (MECP 2022b). For this project, potential roost trees were identified in the wooded features along Thornicroft Drain where the proposed road and pedestrian crossings are proposed, and within the Willow plantation (CUP) feature slated for removal. It is recommended that an updated bat habitat assessment be completed as part of Draft Plan conditions at the focused design study stage to determine if the removal of potential

roost trees would be considered a “proportionally small” impact in the local landscape or if further surveys will be required.

## **5.6 Fish Habitat**

Direct fish habitat is present within the Thornicroft Drain, which is a permanent watercourse. Indirect fish habitat is present within two tributaries/HDFs that are within the northern woodland and the western cultural savannah.

The *Fisheries Act* protects fish and fish habitat (as identified within the Act) up to the high-water mark. Works within fish and fish habitat will need to ensure compliance with the *Fisheries Act*, and incorporate measures to protect fish and fish habitat. If all of the steps/measures can be followed, then further review by DFO is not required. However, if all steps and measures cannot be implemented completely, then a Request for Review must be initiated to DFO.

Thornicroft Drain and other watercourse/drainage features are regulated by the UTRCA according to Ontario Regulation 41/24 (Government of Ontario 2024). The UTRCA can prohibit or regulate the straightening, changing, diverting, or interfering in any way with the existing channel the creek. Development or interference within the 30m regulation limit may be permitted if, in the opinion of the UTRCA, the development will not affect the control of flooding, erosion, dynamic beaches, or unstable soil or bedrock.

Development and site alteration within watercourses and their associated fish habitat is prohibited except in accordance with provincial and federal requirements and where the habitat to provide for the life requirements of aquatic systems will not be reduced (City of London 2026).

## **5.7 Other Drainage Features**

The golf driving range pond, which is a man-made feature, is shown on the London Plan, Natural Features Map. This feature was assessed for significance and determined not to provide SWH or ecological significance.

Although not shown on the London Plan mapping, HDF features (as show on Map 5 of this report) were assessed in Table 7. Based on this analysis, numerous HDF's warrant conservation or protection. While less restrictive, several of the HDF segments should have their terrestrial linkages maintained even if the flow is altered. The remaining HDF segments do not require any management. Map 5 shows the HDF segments within the subject lands and the colour-coded management guideline based on the analysis.

Six segments (TDT11-1, TDT11-2, TDT11-3, TDT11-4, TDT17-1 and TDT17-2) warrant protection (red segments on Map 5) based on the analysis. The reaches associated with TDT11 are within the northwestern woodland and provide an important function for riparian habitat, contributing function for downstream fish habitat within the Thornicroft Drain, and valued function in providing amphibian breeding habitat and wildlife movement habitat. Segments TDT17-1 and TDT17-2 are located along the southern edge of the western cultural savannah community. These segments provide important function for riparian habitat, contributing function for downstream fish habitat within the Thornicroft Drain, and valued function for naturalized vegetation along the corridor and facilitating wildlife movement.

The other HDF segments within the northern woodlot (TDT11-5, TDT12-1, and TDT13-1) warrant conservation based on the analysis. These HDFs are all located within a wooded feature with wetland present. Within the southern portion of the subject lands, TDT1-1, TDT1-2, TDT1-3, TDT1-4, TDT3-2, TDT5-1, and TDT5-1A are all conservation rating as there is wetland or forested features present. The remaining conservation rated segment (TDT6-1) is located within the Thornicroft Drain corridor where there is riparian habitat present.

## **5.8 Corridors and Linkages**

Within the landscape context, the Thornicroft Drain and natural riparian cover associated with it are important for the movement of local wildlife south of Southdale Road to Dingman Creek further south. There are no natural areas north of Southdale Road, which is entirely developed. The proposed natural connection to the west, through the Westwinds, W3, and Heathwoods developments, will provide an east-west wildlife connection, to an upstream portion of Dingman Creek.

## **5.9 Potential Naturalization Areas**

Potential Naturalization Areas are areas where the opportunity exists to enhance, restore, or expand the Natural Heritage System. These areas may include lands suitable to create natural habitats or to compensate for trees lost to development. Naturalization Areas are an important component of the Natural Heritage System as they may enhance, restore, or strengthen and expand the health and viability of a natural heritage feature or area.

The subject lands have not been identified as Potential Naturalization Areas in the London Plan (2026). The London EMG (2025) recommends the selection of equivalent naturalization areas based on the ability of the proposed site to enhance lands adjacent to the City's Natural

Heritage System. Opportunities for naturalization exist within all the proposed buffer areas and buffer enhancement areas, as well as the enhancement of existing features, as identified below.

## 5.10 Summary of Natural Feature Constraints

**Table 10. Summary of Natural Feature Constraints**

| Natural Feature Constraint                                        | Regulatory and Permitting Considerations                                                                                                                                                                                                    | Project Considerations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Significant and Unevaluated Wetlands                              | <ul style="list-style-type: none"> <li>Provincial Policy Statement (OMMAH 2024)</li> <li>London Plan (2026) <ul style="list-style-type: none"> <li>Policy 1332, 1333, 1334, 1335, &amp; 1336.</li> </ul> </li> <li>O. Reg. 41/24</li> </ul> | <ul style="list-style-type: none"> <li>The North Talbot Wetlands (UT57) PSW complex is located ~900m to the west of the subject lands.</li> <li>No PSW's within the study area. Wetland features within the subject lands have not been evaluated.</li> <li>No significant wetlands within the subject lands.</li> <li>London Plan Policy 1334 indicates that for non-PSW, there shall be no net loss of the wetlands' features or function. In some instances, and in consultation with the UTRCA, the City may consider the replacement of wetlands rather than in situ protection where the features and functions of the wetland may be provided elsewhere and would enhance or restore the NHS. Replacement is required at a minimum ratio of 1:1.</li> </ul>                                                                                                               |
| Significant Woodland, Woodlands, and Unevaluated Woodland Patches | <ul style="list-style-type: none"> <li>Provincial Policy Statement (OMMAH 2024)</li> <li>London Plan (2026) <ul style="list-style-type: none"> <li>Policy 1337, 1338, 1339, 1340, 1341, 1342, 1343</li> </ul> </li> </ul>                   | <ul style="list-style-type: none"> <li>Patch 10064 and the entire treed area along the Thornicroft Drain that is contiguous with this woodland is considered significant.</li> <li>Patch 10065, which is shown as unevaluated on London Plan Mapping has been evaluated as non-significant.</li> <li>Unevaluated Patch of CUS based on the EMG Woodland Evaluation comes out as significant.</li> <li>CUS is not considered a woodland under ELC Manual (Lee et al. 1998) or the Forestry Act (1990).</li> <li>CUS not considered significant under PPS.</li> <li>The CUS is a naturalized former residential lot.</li> <li>Policy 1342A indicates that development and site alteration shall not be permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.</li> </ul> |
| Significant Valleylands and Valleylands                           | <ul style="list-style-type: none"> <li>Provincial Policy Statement (OMMAH 2024)</li> <li>London Plan (2026) <ul style="list-style-type: none"> <li>Policy 1344, 1344A, 1344B, 1449, 1350</li> </ul> </li> </ul>                             | <ul style="list-style-type: none"> <li>Significant valleyland is associated with the Thornicroft Drain.</li> <li>Valleyland within the agricultural field was assessed as part of HDF and determined to not be present.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Natural Feature Constraint                    | Regulatory and Permitting Considerations                                                                                                                                                                                                                                         | Project Considerations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               |                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Development and site alteration shall not be permitted unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological function.</li> <li>• London Plan Policy 1350 s.2 indicates that minimum width of valleylands will generally be comprised of 30m on each side of the watercourse measured from the high-water mark.</li> <li>• Hazard areas (i.e. valley slopes) are regulated by UTRCA.</li> </ul>                                                             |
| Significant Wildlife Habitat                  | <ul style="list-style-type: none"> <li>• Provincial Policy Statement (OMMAH 2024)</li> <li>• London Plan (2026) <ul style="list-style-type: none"> <li>• Policy 1352, 1353, 1354</li> </ul> </li> </ul>                                                                          | <ul style="list-style-type: none"> <li>• Bat Maternity Habitat is Candidate.</li> <li>• Snake Hibernaculum is Candidate.</li> <li>• FOD7-4 (Fresh-Moist Black Walnut Lowland Deciduous Forest) is confirmed.</li> <li>• Terrestrial Crayfish habitat is confirmed within SWD2-2 communities.</li> <li>• Eastern Wood-Pewee habitat is confirmed.</li> <li>• Development or site alteration in or adjacent to SWH is not permitted unless it has been demonstrated that there will be no negative impacts on the features or their ecological function.</li> </ul> |
| Habitat for Threatened and Endangered Species | <ul style="list-style-type: none"> <li>• Species Conservation Act</li> <li>• Species at Risk Act</li> <li>• Provincial Policy Statement (OMMAH 2024)</li> <li>• London Plan (2026) <ul style="list-style-type: none"> <li>• Policy 1325, 1326, 1327, 1328</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Butternut found within the southern portion of subject lands, within FOD6-5 community.</li> <li>• Candidate Habitat for Protected Species Bats present within treed areas including FOD6-5, FOD7-3, FOD7-4 and CUS1 communities.</li> <li>• Development and site alteration shall not be permitted in the habitat of endangered or threatened species, except in accordance with provincial and federal requirements.</li> </ul>                                                                                         |
| Fish Habitat                                  | <ul style="list-style-type: none"> <li>• Provincial Policy Statement (OMMAH 2024)</li> <li>• Federal Fisheries Act (1985)</li> <li>• London Plan (2026) <ul style="list-style-type: none"> <li>• Policy 1323, 1324</li> </ul> </li> </ul>                                        | <ul style="list-style-type: none"> <li>• Fish habitat is present within Thornicroft Drain and HDF's within the subject lands.</li> <li>• Development and site alteration shall not be permitted in fish habitat except in accordance with relevant provincial and federal requirements.</li> <li>• Crossings and in-water work need to consider fish habitat.</li> </ul>                                                                                                                                                                                          |
| Other Drainage Features                       | <ul style="list-style-type: none"> <li>• Environmental Planning Policy Manual (UTRCA 2006)</li> <li>• Ont. Reg. 41/24</li> <li>• Federal Fisheries Act (1985)</li> <li>• London Plan (2026) <ul style="list-style-type: none"> <li>• Policy 1387</li> </ul> </li> </ul>          | <ul style="list-style-type: none"> <li>• HDF features within the subject lands were assessed to determine management recommendation.</li> <li>• Pond within the golf driving range lands considered under London Plan Policy 1387.</li> </ul>                                                                                                                                                                                                                                                                                                                     |

| Natural Feature Constraint     | Regulatory and Permitting Considerations                                                                                                                | Project Considerations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Linkages and Corridors         | --                                                                                                                                                      | <ul style="list-style-type: none"> <li>Thornicroft Drain provides a north-south linkage for wildlife, connecting to Dingman Creek in the south. A linkage through the western CUS is proposed to connect the Thornicroft corridor to natural areas to the west of Bostwick Road by providing a wildlife movement culvert beneath the road as part of the proposed Westwinds development.</li> </ul>                                                                                                                                                                                                                    |
| Potential Naturalization Areas | <ul style="list-style-type: none"> <li>London Plan (2026)               <ul style="list-style-type: none"> <li>Policy 1378, 1379</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>Potential Naturalization Areas are included in the Green Space Place Type, which is part of the City's Natural Heritage System. Policies outlined in the London Plan (2026) provide protection for this system. Only specific, low impact development is permitted within this system.</li> <li>No Potential Naturalization Areas identified by the London Plan are present in the study area. The recommended buffers and buffer enhancement areas provide naturalization opportunities, as well as opportunities for enhancing existing natural heritage features.</li> </ul> |

## 6.0 Ecological Buffers

Ecological buffers are required for natural heritage features such as woodlands, wetlands, and significant wildlife habitats to protect them from impacts during and after development. Properly functioning buffers protect natural features against sedimentation, erosion, provide attenuation of precipitation and run-off, protect against human disturbances, serve as habitat transition zones, and contribute to the protection of the natural feature through, for example, maintaining microclimate conditions and limiting the spread of invasive species to within the sensitive natural feature.

The outer limit of the buffer determines the constraint to development activities within the subject lands. Buffers are shown on Map 8a and 8b. All development, including any form of construction or grading, is to remain outside of the recommended buffer limits, where possible.

The City of London EMG (2007), indicates the minimum buffers for Significant Woodlands/ Woodlands was 10m from the dripline edge, 15m from non-significant wetlands, and 30m from the high-water mark. As this project started prior to the new EMG being released, as well as that a buffer had been determined for natural features associated with the Bostwick Road EA (Parsons 2019), it was identified that the minimum buffers for woodlands and wetlands would follow the 2007 EMG.

The proposed development must conform to the recommended minimum buffers widths unless it is demonstrated that the natural heritage features or functions will be adequately protected by a narrower buffer (London Plan 2026).

Ecological buffers are illustrated on Map 8a and 8b, and are further outlined below in Table 11. Buffers are discussed below in the context of impact avoidance and mitigation.

**Table 11. Buffers**

| Natural Heritage Feature                                  | Significance/<br>Sensitivity                                             | Natural Environment Buffers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Patch 10064<br>Northwestern<br>Woodland                   | Significant Woodland                                                     | <p>The Bostwick EA (Parsons 2019) identified a 30m buffer from the southern edge of the Patch to the proposed Bradley Avenue extension. Minimal encroachment into that buffer from the proposed road alignment was seen as acceptable (Parsons 2019). A pathway within this buffer was agreed to be acceptable by the City of London.</p> <p>Along the eastern edge of the woodland, a 10m buffer from dripline is recommended, in accordance with the 2007 EMG.</p> <p>The northern edge of this woodland has been provided a 20m buffer in accordance with the most current version of the EMG (City of London 2025). This buffer is discussed in detail in the 3080 Bostwick Road - Block 7, 8 and 9 EIS, prepared under a separate cover by NRSI 2026a).</p> |
| Thornicroft Drain<br>(FOD7-3, FOD6-5)                     | Significant Valleyland,<br>Watercourse, Significant<br>Woodland, Wetland | <p>30m buffer from high watermark on watercourse (both sides).<br/>10m buffer from Significant Woodland dripline.<br/>15m from wetland inclusions.</p> <p><b>Outer Natural Environment buffer is furthest extent of buffers along the Thornicroft Drain, which delineates the Significant Valleyland.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Cultural Savanah<br>(CUS1)                                |                                                                          | <p>No buffer proposed.<br/>HDF (TDT17) in this area is proposed to be realigned and its functions must be protected as an open feature.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Headwater Drainage<br>Feature (TDT1-1,<br>TDT1-2, TDT1-3) | Other Drainage Feature                                                   | The HDF and wetland are proposed for removal and compensation at the far south end of the subject lands.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Patch 10065 (FOD6-5)                                      | Woodland                                                                 | 10m buffer from dripline.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Cultural Plantation<br>(CUP) - south                      |                                                                          | No buffer proposed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| FOD6-5 (a) - south                                        | Woodland                                                                 | 10m buffer from woodland dripline.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Cultural Meadow<br>(CUM1)                                 | None                                                                     | No buffers proposed on the feature within the subject lands or adjacent figures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## **7.0 Impact Analysis and Recommendations**

Details of the proposed development are included in the following supporting documents: Draft Plan of Subdivision (MHBC 2025), Drainage and Floodlines Future Conditions Report (Matrix Solutions Inc. 2022), Functional Stormwater Management Report (Stantec Consulting Ltd. 2025), and Hydrogeological Assessment report (EXP 2024). Refer to Map 9a and 9b for the proposed development plan and Appendix XIII for the Draft Plan of Subdivision (MHBC 2025).

### **7.1 Proposed Development**

The proposed development includes a mixture of low, low to medium, medium, and medium to high residential density blocks as shown in Appendix XIII (MHBC 2025). It also includes, park and open space blocks, stormwater management blocks, and the associated roads, road widening and walkways. Please note that proposed development concept also includes the development Blocks associated with the 3080 Bostwick Lands – Block 7, 8 and 9 development. They are listed as Blocks 35, 43, 51 and 81 on the concept plan provided in Appendix XIII. These blocks are included in the description below of the proposed development, environmental impacts associated with the development of these Blocks have been addressed in the 3080 Bostwick Lands – Blocks 7, 8 and 9 EIS report prepared by NRSI under a separate cover (2026a).

Connections are proposed from the roads in the development concept to other proposed developments in the vicinity of the subject lands. Most notably, Kilbourne Road will extend across the existing hydro corridor easement to the east of the subject lands. This road extension will connect to lands on the east side of the corridor from the proposed development. An existing drive is present in this location.

The Draft Plan of Subdivision (MHBC 2025), Appendix XIII, includes the following:

- Low Density is shown in pale yellow and includes Blocks 1, 2, 8, 10-12, 16-22 and 44; totaling an area of 10.177ha.
- Medium Density (Street Townhomes) is shown in a darker yellow and includes Blocks 5-7, 9, 23-34, 40 and 46; totaling an area of 10.047ha.
- Medium Density is shown in light tan and includes Blocks 42, 43, 45, 47 and 59; totalling an area of 3.638ha.
- Medium Density (Apartments) is shown in brown and includes Blocks 3, 35, 36 and 49-55; totaling an area of 14.159ha.

- High Density is shown in orange and includes Block 41; totaling an area of 2.956ha.
- Park Blocks are shown in teal and include Blocks 71-73 for an area of 3.253ha.
- Stormwater Management Blocks are shown in dark green and include Blocks 85-88 for an area of 4.225ha.
- Open Space is shown a light green and includes Blocks 74-81; totaling an area of 26.776ha.
- Walkways are shown in green and include Blocks 60-70; totaling an area of 2.063ha.

A Functional Stormwater Management Report (FSWMR) has been prepared by Stantec Consulting Ltd. (2025). The FSWMR identifies the proposed stormwater management (SWM) strategy for the development of the subject lands. The proposed approach to SWM will involve the use of four SWM dry facility ponds to provide quantity and quality control for flows from the subject lands prior to discharge into the Thornicroft Drain. The SWM ponds proposed on the subject lands will also attenuate flows from three offsite developments, the proposed Westwinds Development, Phase 3 of the W3 Development and the Wonderland Commercial Lands, as well as the development of Blocks 8 and 9 on the 3080 Bostwick Lands (NRSI 2026a). The dry ponds will be naturalized green features with inlet and outlet works for quantity control.

Minor encroachment is proposed into natural features on the subject lands to allow for the proposed development. This will include the removal of a CUM1 and CUP community in the northeast of the subject lands. A small MAM2-2 is also proposed for removal in the southwest of the subject lands, for which compensation will be provided to the immediate south of the existing feature. Finally, a small portion of the CUS1 community on the west side of the subject lands will be removed to allow for the construction of a SWM pond. Vegetation removals have been limited to the greatest extent possible and compensation is proposed on the subject lands within the enhanced Thornicroft Drain corridor.

The proposed development will be phased as per the Functional Planning Report (FPR) (MHBC 2024). The phasing of the proposed development should take into account the recommendations provided in this SLSR and EIS report.

### **7.1.1 Stormwater Management**

The approach to SWM is described in detail in the FSWMR (Stantec 2025). The report takes into account existing conditions of the site and SWM design criteria to ensure that quantity, quality and water balance controls align with existing conditions on site and the required parameters as per relevant background documents, as cited in the FSWMR, including the accepted Dingman Creek Subwatershed: Stormwater Servicing Study, Master Plan and Schedule B Municipal Class EA (Aquafor Beech 2020).

The proposed SWM strategy will see the subject lands divided into four separate post-development catchments. Flows from three additional catchment areas, two on the west side of Bostwick Road and one to the east of the subject lands, will also be serviced by the SWM facilities on the subject lands. The catchment areas on the adjacent lands comprise the proposed Westwinds Development and phase 3 of the W3 Development. Each catchment area will be serviced by one of four SWM ponds proposed for the subject lands. The post-development catchment areas will closely align with the pre-development catchment areas.

Each of the four SWM ponds is proposed to be a dry facility and have been sized to ensure that they will fit in the proposed SWM blocks, as shown on the Draft Plan (Appendix XIII). Expected flow rates for each catchment area were calculated using the 2-year 24 hour storm and 100-year 24 hour design storms. Release rates were used to size each SWM in consideration of the area available for each pond. Calculations provided in the FSWMR demonstrate that each SWM pond will provide sufficient storage for flows from their respective catchment area (Stantec 2025).

The proposed SWM approach includes low impact development (LID) source controls to ensure that water quality treatment to remove 80% of total suspended sediment (TSS) is provided for the proposed development area. LID measures are proposed for the boulevard areas and will include the use of shallow, turfed depressions that will infiltrate initial flows and provide filtration. A perforated pipe below the depression will collect clean water and convey it to the local storm sewer. During storm events, catchbasins within the roadways will capture overflow from the depressions. Storm sewer exfiltration systems are also proposed, these systems involve the use of perforated pipes installed below storm sewers to discharge runoff from small storm events to granular trenches allowing stormwater to infiltrate into the soil. Catchbasin inserts provide pretreatment of stormwater runoff. Oil/grit separators are to be installed upstream of each stormwater outlet to provide TSS removal, as with the exfiltration systems pretreatment

will be provided by catchbasin inserts. The feasibility of including additional infiltration measures will be examined at the focused design stage and may allow for infiltration at the SWM ponds in addition to upstream areas.

The FSWMR concludes that the necessary SWM measures can be provided in the block areas shown on the Draft Plan (Appendix XIII) and will limit stormwater flows to existing flow rates, SWM measures will be designed to provide 80% TSS removal and additional infiltration measures to maintain water balance will be explored during detailed design.

### **7.1.2 Water Balance**

According to City of London requirement, water balance calculations are required for proposed developments. Calculations related to water balance are provided in the Hydrogeological Report prepared by EXP Services Inc. (2024). The water balance calculations prepared by EXP account for all water in and out-flows in the hydrologic cycle including precipitation, runoff, evapotranspiration and infiltration (2024). A feature-based water balance assessment approach was taken for each of the wetlands on the subject lands, where wetlands are located in close proximity to each other they have been treated as a single wetland area. The three wetland areas used for the feature-base water balance assessment include:

- Northern Woodlot Wetlands – Catchment A: SWD2-2 communities in FOD6-5
- Central Thornicroft Drain Wetland – Catchment B: MAM2-2 / SWD4-1
- Southern Tributary Wetlands – Catchment C: MAM2-2 communities in CUM1 and CUS1

The feature-based water balance assessment identifies the anticipated runoff and infiltration volume at each wetland area for pre- and post-development conditions. Only pre-development water balance conditions were calculated for Catchment C, as the majority of the wetlands in this catchment area will be removed and compensated for on the subject lands.

Within Catchment A it is currently calculated that 70% of pre-development runoff will be maintained to wetlands under post-development conditions (pre-development: 32,196 m<sup>3</sup>/year; post-development: 22,691 m<sup>3</sup>/year). These wetlands are maintained primarily through surface runoff contributions and are dry during the summer months (EXP 2024). Additional analysis will be undertaken to increase the clean water directed to the wetland units within Catchment A, which can be done through the proposed development of the 3080 Bostwick Road site to the

north. Clean water may also be taken from Block 50 on the south side of Bradley Avenue and directed to the southern wetland unit. Further analysis of the runoff that will be contributed to the wetlands in Catchment A will be completed at the focused design studies stage of the project. It is anticipated that this will result in an increase to clean surface runoff contributed to the wetlands under post-development conditions, bringing the water balance to within 10% of predevelopment conditions.

It has been calculated that 32% of pre-development runoff will be contributed to the wetland in Catchment B under post-development conditions (pre-development: 29,659m<sup>3</sup>/year; post-development: 9,818m<sup>3</sup>/year) (EXP 2024). This wetland is also primarily maintained through surface runoff and no ponded water was observed during monitoring, with the exception of the portion of the wetland located within the Thornicroft Drain. It is expected that flows from the Thornicroft Drain are also maintaining this wetland and will continue to be present under post-development conditions. It is understood that further analysis will be undertaken to quantify the contributions that are received to this wetland from flows associated with the Thornicroft Drain, which will be completed at the focused design studies stage of the project. Clean water can be directed to this wetland from the buffer area, the SWM block (Block 85) through the use of a spreader swale, and rear yard and roof water from the low-density development in Blocks 1 and 8. The analysis will aim to bring the wetland water balance to within 10% of the wetland to predevelopment conditions.

## **7.2 Buffer Analysis**

Buffers from natural heritage features were recommended in Section 6.0 and are shown on Map 8a and 8b. As can be seen on the mapping, the development limit generally includes the recommended buffers, along with additional lands. The additional lands include the 250 year floodplain mapped by Matrix; floodplain compensation areas as mapped by Matrix; a woodland compensation area from the 3080 Bostwick lands; and some buffer “rounding” areas to provide a straight development boundary. Overall, there is more total natural compensation area provided than areas of natural feature and buffer encroachment, as illustrated on Maps 9a and 9b, and 10a and 10b.

The additional floodplain areas outside of the outer natural environment buffer and within the limit of development have been considered as areas of buffer exceedance; they will function as compensation areas for encroachment into natural features within the subject lands. These

areas are to be planted and enhanced to improve ecological functions along the Thornicroft Drain and its associated corridor.

**Table 12. Buffer Analysis**

| Natural Heritage Feature                                                                          | Natural Environment Buffer Analysis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Patch 10064<br>Northwestern Woodland<br>(Significant Woodland, HDF's, Wetland, Thornicroft Drain) | <p>Proposed Bradley Avenue Extension was previously agreed upon with the area between the dripline and the road being identified as Open Space and a trail/walkway. The Bradley Ave. crossing over the Thornicroft Drain is not considered as part of this EIS.</p> <p>Outer buffer along eastern edge being fully adhered to. Woodland compensation from the Bostwick EIS (Stantec 2022) will be provided outside of the 10m buffer from the existing woodland.</p> <p>An additional 8.0m wide walkway (0.271ha) along the eastern edge of the open space block provides an additional setback from Blocks 71 and 42.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Thornicroft Drain<br>(FOD7-3, FOD6-5, wetland inclusions)                                         | <p>Outer buffer along the Thornicroft Drain is being fully adhered to other than for the Kilbourne Road (Hayward Parkway) crossing, the pedestrian crossing into the CUS and minor encroachments resulting from the Block 87 SWM pond construction (NRSI 2026b)</p> <p>The area of encroachment into the outer buffer as a result of the Kilbourne Road (Hayward Parkway) crossing will be 0.168ha. An 8.0m wide pedestrian walkway along the north side of the road and associated with the bridge crossing will also be located within the buffer, but has not been considered an encroachment since pathways are permitted within ecological buffers as per the EMG (City of London 2025).</p> <p>A separate 13.0m wide pedestrian bridge crossing/walkway is proposed over the Thornicroft Drain and into the CUS1 feature. As described above, this proposed walkway has not been considered an encroachment since pathways are permitted within ecological buffers.</p> <p>Encroachment into the buffer associated with the construction of the Block 87 SWM pond will total an area of 0.029ha (NRSI 2026b).</p> <p>The total area of encroachment into the buffers associated with the Thornicroft Drain corridor is approximately 0.197ha.</p> <p>Buffer exceedance area provided outside of the natural heritage buffers along the Thornicroft Drain amount to approximately 2.158ha in area.</p> |
| Cultural Savanah<br>(CUS1)                                                                        | <p>A 10m setback from southern edge of the CUS1 to Block 52 is provided, despite it not being recommended above.</p> <p>HDF (TDT17) is slated to be realigned to be in line with Westwinds Development on western side of Bostwick Road in order to address flooding issues on the west side of the road. The HDF requires conservation. Additional assessment will be required as a Draft Plan condition to determine the best discharge location to Thornicroft Drain. It is recommended that clean runoff from Block 52 be directed to this HDF to maintain flows to the feature.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Natural Heritage Feature                            | Natural Environment Buffer Analysis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                     | SWM facility block slated to partially overlap the northern corner of the feature (0.414ha) but outside of the Thornicroft Drain corridor.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Headwater Drainage Feature (TDT1-1, TDT1-2, TDT1-3) | HDF (TDT1) proposed to be removed to allow for Kilbourne Road crossing, Block 46 and walkway. HDF feature to be realigned (Conservation segment within the SWM Pond Block 88 and Open Space Block 79. As these features are proposed for removal and compensation no buffers have been identified for them.                                                                                                                                                                                                                                                                                      |
| Wetlands                                            | MAM2-2 wetland (0.176ha) to be removed.<br><br>A constructed wetland block of 0.370ha is proposed within the southernmost end of the subdivision lands (Block 79 and 78B), on the west side of Thornicroft Drain. The wetland size provides compensation for the 0.20ha area removed from the Bostwick Lands as well as the 0.176ha removed from the Kilbourne and Westgate lands. A buffer will be added to the proposed wetland which will result in a total area of constructed wetland and buffer of approximately 0.434ha. The HDF feature will be realigned into this constructed wetland. |
| Patch 10065 (FOD6-5)                                | 10m buffer from the property line being adhered to. Encroachment into the 10m buffer from the dripline of 0.071ha. Area along the woodland is active agriculture. No encroachment into the dripline will occur.<br><br>Buffer exceedance areas provided to the south of Patch 10065 amount to a total area of approximately 0.082ha.                                                                                                                                                                                                                                                             |
| Cultural Plantation (CUP)                           | No buffer proposed. Area of removal is 1.003ha.<br><br>Compensation provided within buffer exceedance areas identified along the Thornicroft Drain.                                                                                                                                                                                                                                                                                                                                                                                                                                              |

### 7.3 Natural Feature Encroachment and Compensation

Several vegetation communities are proposed for removal or partial removal within the subject lands. These removals are considered necessary in order to implement the proposed development concept; they have been limited to the greatest extent possible. Additionally, the 3080 Bostwick EIS (Stantec 2018, 2020, 2022) has identified that a small area of woodland and wetland that is proposed for removal support of that project will be compensated for on the Kilbourne and Westgate lands. Vegetation community removals will be compensated for through habitat creation and restoration along the Thornicroft Drain corridor and in the southernmost part of the subject lands. Encroachment into natural features and vegetation communities is described in the sections below, along with proposed mitigation and compensation measures. Proposed removals of vegetation communities, as well as buffer encroachments are shown on Map 9a and 9b. Areas proposed for compensation related to the removal of natural features are shown on Map 10a and 10b.

### **7.3.1 Cultural Plantation Removal and Compensation**

As identified in the table above, the cultural plantation is proposed to be removed to allow for the development. This feature occupies an area of 1.003ha. This feature is identified as being within the City's Tree Protection Area, however trees within this area are not specifically protected by this by-law, as outlined in criteria subsection (d), which provides exemption to trees to be removed. Policy 399 of the London Plan also indicates that trees to be removed should be replaced at a ratio of one tree per ten centimeters of tree diameter removed for trees 50cm DBH or greater. Where development does not provide adequate space for replacement trees, the City Planner may require a cash contribution in lieu of such planting.

The primary compensation strategy for the subject lands is to provide a 60m plus corridor along Thornicroft Drain which will provide an enhancement to the feature, as there is currently active agriculture, or active works along most of the Drain up to the dripline. Compensation for trees removed from the cultural plantation will be provided within these areas. The number of trees required as compensation will be determined through the completion of a Tree Inventory and Preservation Plan (TIPP) at the focused design stage.

### **7.3.2 Woodland Compensation for 3080 Bostwick EIS**

Woodland compensation, as identified in the 3080 Bostwick Road EIS Addendum (Stantec 2022) will be provided within the subject lands. The proposed woodland compensation is shown on Figure 1 of the Stantec Report (2022), and was identified as an area of 0.12ha. The proposed woodland compensation area is located just west of Park Block 71 and Block 42, between the trail and outer buffer limit. Woodland compensation plan objectives were identified within the 3080 Bostwick Road EIS Addendum (Stantec 2022) and include these initiatives:

- Planting trees in a continuous area of no less than 0.12ha that would complement the Thornicroft NHS corridor;
- Be a predominantly Black Walnut dominated stand with inclusion of mast producing trees for wildlife, mammals, and avian fauna;
- Site preparation procedures to remove and control non-native, invasive plant species;
- Soil amendments to enable successful establishment;
- Target plant community composition (proportions), quantities, stock-size, and spacing;

- Increasing the total area of woodland cover in the regional landscape;
- Improving associated landscape functions such as vegetative linkages and interior forest areas;
- Improving forest ecological characteristics such as species diversity, age class distribution and structural diversity, while retaining native genetics through seed collection and replanting; and,
- Incorporating specific wildlife habitat features for bats, deer and other wildlife, such as bat roosting structures, coniferous tree clusters for cover, browse-tolerant shrubs and mast producing trees.

### **7.3.3 Woodland Compensation for 3563 Bostwick Road, Westwinds Subdivision EIS**

A portion of the compensation plantings required for the 3563 Bostwick Road, Westwinds Subdivision, and identified in the EIS report prepared by MTE (2023a), will be provided on the subject lands. Tree plantings have been recommended to occur on the subject lands and the proposed planting area has been identified on Figure 11 of the MTE EIS report (2023a). These plantings are proposed to enhance the east-west woodland linkage across Bostwick Road and are proposed within the cultural savannah at the western edge of the subject lands. The following recommendations are provided in the EIS report (MTE 2023a) to inform this compensation:

- Preparation of TIPP by a certified arborist for the property at 3563 Bostwick Road to inform tree removals and retention.
- Incorporation of tree and plant species native to Ecoregion 7E that are suitable for the existing soil conditions. On the subject lands, these species should reflect those present within the existing cultural savannah community.
- Inclusion of native understorey and groundcover vegetation, as well as native seed mix application within the planting areas.
- Should the CUS1 community be determined to not be the best location for the proposed plantings, they should be completed within the buffer exceedance areas located along the Thornicroft Drain.

### **7.3.4 Woodland Removal for Kilbourne Road (Hayward Parkway) Crossing and Pedestrian Walkway**

As a component of the development concept, Kilbourne Road (Hayward Parkway) is proposed to be extended east-west through the subject lands. At the request of the City, the Kilbourne

Road (Hayward Parkway) extension will cross the Thornicroft Drain corridor at a narrow point in the FOD7-3 community, as shown on Map 9B. A pedestrian walkway is proposed on the north side of the Kilbourne Road (Hayward Parkway) extension and will also cross the Thornicroft Drain. A total woodland area of 0.077ha may be impacted within the FOD7-3 community to support the construction of the Kilbourne Road (Hayward Parkway) and pedestrian walkway crossing.

Compensation has not been proposed for the Kilbourne Road crossing at this time, since it is anticipated to be a bridge and direction for the location of the crossing was provided by the City of London. Tree removals are anticipated to be required for the construction of the crossing, but the proposed crossing will allow for wildlife movement along the Thornicroft Drain corridor under post-development conditions. A more detailed impact analysis should be completed at the focused design stage for the road crossing, in addition to the completion of a comprehensive TIPP to assess any required tree removals and compensation.

### **7.3.5 Woodland Removal for Pedestrian Walkway**

A pedestrian bridge crossing/walkway is proposed over the Thornicroft Drain and will extend from the proposed park (Block 72) to the connect with the proposed pedestrian walkway along the east side of the Thornicroft Drain corridor and Street D. The construction of this pedestrian bridge may result in impacts to 0.065ha of the FOD7-3 feature.

A TIPP will be conducted at the focused design stage of the project to assess tree removals and any required tree compensation. Area based compensation has not been proposed for this walkway crossing. Tree removals are anticipated to be required; however, the woodland community itself will be retained allowing for movement of wildlife and vegetation growth beneath the walkway. A more detailed impact analysis should be undertaken at the focused design stage for the walkway, in addition to the above-described TIPP.

### **7.3.6 Woodland Removal for Block 87 SWM Pond**

NRSI prepared an EMP for the construction of the SWM pond associated with Block 87 (NRSI 2026b). As a result of the proposed construction of the SWM pond outflow structure, a total woodland area of approximately 0.038ha will be removed. The removal of this woodland area will be compensated for within the Thornicroft Drain corridor. A detailed assessment of impacts associated with this woodland removal is provided in the EMP (NRSI 2026b).

### **7.3.7 Wetland/Pond Removals and Compensation**

A small MAM2-2 inclusion is proposed for removal from the south end of the subject lands. This wetland inclusion is associated with an HDF (TDT1) that is also proposed for removal and compensation. Management recommendations for the three reaches of the HDF that will be removed in support of the proposed development have been identified as 'Conservation' in accordance with the Headwater Guideline (TRCA and CVC 2014).

The MAM2-2 inclusion that has been proposed for removal is 0.176ha in size and has been assessed as not significant due to its small size and lack of significant functions. This wetland is dominated by non-native vegetation and does not provide SWH. The primary ecological function of this wetland is the collection of surface water flows and floodwater during spring melt and significant rainfall events. The MAM2-2 wetland inclusion receives input from the associated HDF and flows are directed to the Thorncroft Drain from the wetland. Proposed compensation for the removal of the MAM2-2 wetland and the associated HDF are described below.

A small constructed pond, that is associated with the golf driving range on the subject lands is proposed for removal in support of the proposed development. This feature does not provide SWH and provides very low-quality habitat for wildlife in general. Since it is a man-made pond, no compensation has been recommended for its removal; however, a wildlife salvage should be undertaken to relocate any wildlife that may be present.

The Bostwick EIS (Stantec 2018, 2020) identified a small meadow marsh with a total area of 0.2ha. Through agency correspondence it was determined that this feature could be removed, but would need to be compensated for. As identified within the EIS Addendum #2 (Stantec 2022), the wetland compensation from 3080 Bostwick development is being incorporated into the Kilbourne and Westgate Development Lands. The following is being proposed, consistent with the EIS Addendum (Stantec 2022):

- A constructed wetland of 0.376ha is proposed within an open space block at the southernmost end of the subdivision lands, on the west side of the Thorncroft Drain, and within the Thorncroft Drain corridor. The wetland size provides the compensation for the 0.20ha area of meadow marsh removed from within the Bostwick Lands, and 0.176ha of wetland to be removed from within the Kilbourne

and Westgate lands. A buffer will be added to the proposed wetland which would result in a total area of constructed wetland and buffer of approximately 0.573ha.

- The constructed wetland is not connected to any proposed SWM ponds. The constructed wetland is to be graded into the valleyland, outside of the dripline limits, and connect to the Thornicroft floodplain. The bottom elevation is proposed to be at 261.7 metres above sea level (masl), which is slightly below the 2-year water level (262.0 masl). The detailed design of the wetland will include micro-pools and a low flow channel (to replicate the HDF) associated with the MAM2-2 on the Kilbourne Lands. The existing wetland features are primarily meadow marsh; however, the proposed created wetland will provide a more diverse ecological unit with both marsh and peripheral wetland thicket.
- Vegetation Planting Plan is to be comprised of all native species that will be locally sourced and will include the following vegetation communities:
  - Wetland buffer and wetland edge interface – to be dominated by Grey Dogwood, Red Osier Dogwood (*Cornus sericea*), and Nannyberry.
  - Wetland thicket periphery – transitioning from the buffer and edge to a wetland thicket periphery band which surrounds a central marsh meadow and includes Silky Dogwood (*Cornus obliqua*), Winterberry (*Ilex verticillata*), Wild Black Currant (*Ribes americanum*), Pussy Willow, Heart-leaved Willow (*Salix eriocephala*), Common Elderberry (*Sambucus canadensis*), and White Meadowsweet (*Spiraea alba*).
  - Core marsh meadow – will include tolerant wetland species such as Awl Sedge (*Carex stipata*), Common Boneset (*Eupatorium perfoliatum*), Fox Sedge (*Carex vulpinoidea*), Fringed Sedge (*Carex crinita*), Green Bulrush (*Scirpus atrovirens*), Hard-stemmed Bulrush (*Schoenoplectus acutus*), Lurid Sedge (*Carex lurida*), Nodding Beggarticks (*Bidens cernua*), Purple-stemmed Aster (*Symphotrichum puniceum*), Rice Cutgrass (*Leersia oryzoides*), Soft Rush (*Juncus effusus*), Spotted Joe Pye Weed, Swamp Milkweed (*Asclepias incarnata*), Tall Mannagrass (*Glyceria grandis*), and Virginia Wild Rye (*Elymus virginicus*).

### 7.3.8 Cultural Savannah Encroachment and HDF Impacts

A portion of the CUS1 community that is located adjacent to Bostwick Road in the northwest of the subject lands has been proposed for removal in support of the construction of a SWM pond. The proposed pond will result in the removal of approximately 0.414ha of cultural savannah

(formerly a residential lot). The proposed pond will not overlap the probable reptile hibernaculum that has been identified as candidate SWH, nor its 30m buffer. Due to the limited ecological function of the CUS1 and since the SWM pond will be naturalized, no direct habitat compensation has been recommended for this encroachment into the CUS1 community. Any trees that are removed from the CUS1 community will be compensated for; the number of trees required for this compensation will be determined following the preparation of a comprehensive TIPP at the focused design stage.

The HDF (TDT17) within the CUS1 community is proposed to be disconnected from flows associated with the realignment of a tributary located on the lands associated with the proposed Westwinds Development, as described in the Westwinds EIS (MTE 2023a). The proposed realignment strategy will result in flows being directed into the SWM pond through a subterranean pipe. As a result, flows to TDT17 will be reduced significantly and will primarily be contributed from surface water within the CUS1 community. As a result of proposed SWM strategy for the Westwinds development, flows to the Thornicroft Drain can be regulated providing enhanced protection to the drain during storm events. This strategy will also allow for consistency between the proposed Westwinds Draft Plan and the Kilbourne and Westgate Draft Plan, including for drainage and pedestrian pathways. The proposed drainage that will connect the Westwinds Development to the east side of Bostwick Road will include a proposed wildlife culvert beneath Bostwick Road. This culvert will allow safe passage of small wildlife including mammals, reptiles and amphibian underneath Bostwick Road and will function as a movement corridor between natural areas on either side of the arterial road, providing an east-west linkage.

In order to maintain the function of TDT17, it is recommended that clean surface and rooftop runoff from Block 52 be directed to these features. A detailed SWM strategy to ensure that flows continue to be contributed to this HDF should be developed at the focused design stage.

## **7.4 Impact & Net Effects Assessment**

The potential impacts are determined by comparing the characteristics of the existing natural features and their functions to typical residential and construction activities and processes. Where a development proposal overlaps or is adjacent to natural features, impacts may arise.

The following is a description of the types of impacts that have been assessed based on the concept plan.

- **Existing** impacts are discussed in relation to impacts from previous or existing land uses or activities that have affected the natural heritage features of the subject lands.
- **Direct** impacts are discussed in relation to the natural features and wildlife on the subject lands associated with disruption or displacement caused by any potential future 'footprint' of the undertaking.
- **Indirect** impacts are discussed in relation to changes in site conditions such as drainage and water quantity/quality on the subject lands and adjacent communities, as well as impacts that may occur following construction of the development.

#### **7.4.1 Evaluations of the Potential Effects, Mitigation and Net Effects**

Impacts, mitigation measures, other recommendations, and net effects are detailed in Table 13. The table details the impact of all components of the proposed development.

Table 13. Impact Assessment, Mitigation, and Net Effects

| SOURCE OF IMPACT                                                                          | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                                                                                                                                     | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| 1.0 Existing Impacts (where opportunities for net positive effects have been identified): |                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 1.1 Existing Conditions                                                                   | <p>The existing land use along Thornicroft Drain is primarily agricultural, with a golf driving range and industrial buildings also being present in the subject lands. The natural corridor is very narrow in many locations.</p> <p>The cultural savannah (CUS1) adjacent to Bostwick Road is a former residential yard that still contains a remnant building foundation.</p> | <p>A &gt;60m wide complete corridor has been provided along the majority of the Thornicroft Drain corridor length within the subject lands. Natural feature removals within the Thornicroft Drain corridor are only associated with the Bradley Avenue extension (addressed through the Bradley Ave. EA), the proposed Kilbourne Road (Hayward Parkway) crossing and its associated pedestrian walkway, and a pedestrian walkway proposed through the drain corridor east of the CUS1 community (Block 72). Encroachment into buffer areas identified for the Thornicroft Drain corridor are only associated with Kilbourne Road extension, Bradley Avenue extension (addressed through the Bradley Ave. EA) and minor encroachments associated with the construction of the Block 87 SWM pond.</p> <p>The buffer exceedance areas adjacent to the Thornicroft Drain corridor comprise a total area of 2.158ha, which will be restored through plantings to further enhance the ecological structure and function of the Thornicroft corridor.</p> <p>An additional 0.082ha of buffer exceedance area is associated with open space blocks adjacent to vegetation patch #10065 to the northeast of the subject lands.</p> <p>Wetland compensation area has been identified within Block 79 and portions of the adjacent Block 78B. A total area of 0.573ha will be provided for compensation,</p> | <p><u>(+) Net Positive Effect</u></p> <p>The removal of existing agricultural, industrial and recreational land uses adjacent to the Thornicroft Drain, and the establishment of a &gt;60m wide natural corridor will improve the ecological form and function of the watercourse and adjacent natural features.</p> <p>Wide use of pesticides and fertilizer application from the agricultural fields and golf driving range will be eliminated.</p> <p>Encroachment into the Thornicroft Drain corridor will be compensated for through compensation and restoration plantings within the buffer area and buffer exceedance areas.</p> <p>The proposed buffer exceedance and compensation areas along the Thornicroft Drain amount to 2.592ha.</p> <p>Through the development of a comprehensive compensation and restoration plan, the proposed development is not expected to result in a negative impact to natural features within the subject lands or their ecological function. Overall, a net positive effect will be observed for the</p> |

| SOURCE OF IMPACT                                                                                                                                     | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>of which 0.434ha will constitute compensation lands outside of the Thornicroft Drain outer buffer limit.</p> <p>A TIPP will be prepared to address proposed tree removals from the subject lands and to determine compensation requirements.</p> <p>Tree Protection Fencing (TPF) and Erosion and Sediment Control (ESC) fencing should be installed along the property boundary and development limit to clearly demarcate the work area. The locations of the mitigation measures are to be determined at the focused design stage.</p> <p>A Restoration Planting Plan will be developed at the focused design stage and will include native species that have been found within the Thornicroft Drain Corridor and local area.</p>                                                                                                                           | Thornicroft Drain by establishing a vegetated corridor of a substantial width.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>2.0 Direct Impacts:</b>                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>2.1 Site Clearing and Vegetation Removal</p> <p>*Tree Inventory and Preservation Plan not yet completed to address removal of isolated trees.</p> | <p>Site clearing and vegetation removal has the potential to damage tree root systems, destabilize soils, change hydrological flow patterns, and remove wildlife habitat. In addition to isolated tree removals, the following vegetation communities are proposed to be removed, or partially removed.</p> <ul style="list-style-type: none"> <li>• CUP community (1.003ha)</li> <li>• CUS1 community (0.414ha) – area compensation not proposed</li> <li>• FOD7-3 community (0.143ha) – area compensation not proposed</li> <li>• Bostwick EIS woodland (0.12ha)</li> <li>• Block 87 SWM Pond Construction (0.038ha)</li> </ul> | <p>Significant woodlands and vegetation communities are protected to the greatest extent possible, as shown on Maps 7, 8a, 8b, 9a and 9b. Removal of vegetation communities has generally been limited to cultural communities that have been disturbed through anthropogenic activities and narrow projections from woodlands (i.e. the FOD7-3 community). Where the removal of vegetation communities has been proposed, lands have been identified for compensation and restorations plantings, primarily within the Thornicroft Drain corridor. A total area of approximately 2.158ha along the Thornicroft Drain, within buffer exceedance areas, has been identified for compensation. This area will include direct compensation for vegetation community removal as well as compensation for areas of buffer encroachment. The 2.158ha of compensation</p> | <p><u>(+) Net Positive Effect</u></p> <p>With proposed compensation and restoration area plantings, and adherence to wildlife timing windows, no significant net effects are expected. The incorporation of robust native plantings along the Thornicroft Drain corridor will greatly improve the ecological form and function of this feature by providing a corridor that is &gt;60m wide and provides hydrological, wildlife habitat, and wildlife movement functions.</p> <p>The proposed vegetation removals are generally minor in scale relative to the proposed Thornicroft Drain corridor</p> |

| SOURCE OF IMPACT | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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|                  |                                              | <p>lands are located along the outer edge of the 60m wide Thornicroft Drain corridor and function to increase the width substantially and will robustly buffer the drain corridor from adjacent development.</p> <p>Compensation will be provided on the subject lands for the removal of woodland associated with the 3080 Bostwick EIS (Stantec 2022). A total of 0.12ha of compensation lands has been identified on the Kilbourne and Westgate Lands to address this compensation requirement. This compensation area is located within the Thornicroft Drain buffer to the east of Patch #10064.</p> <p>Compensation plantings will be provided on the subject lands for the removal of trees associated with the Westwinds Subdivision EIS (MTE 2023a). Plantings are currently proposed within the western cultural savannah community on the subject lands.</p> <p>Compensation for the CUP community removal (1.003ha) will be provided in the area of buffer exceedance associated with the Thornicroft Drain Corridor. The CUP community has very low species diversity and provides limited ecological functions in its current condition.</p> <p>A SWM pond (0.414ha) is proposed for construction within the CUS1 community and an existing HDF (TDT17) will be disconnected from the realigned tributary associated with the Westwinds development (as described in the Westwinds Subdivision EIS (MTE 2023a)). The realigned tributary will flow through a culvert beneath Bostwick Road and connect to a subterranean pipe proposed within the CUS1 community. An opening will be provided between the culvert and the pipe to allow for wildlife passage</p> | <p>improvements. The communities that have been proposed for removal are generally cultural, provide limited ecological function and have evidence of anthropogenic disturbance. Improved quality of the Thornicroft Drain corridor will result in a net positive effect for this important natural feature.</p> <p>An overall contiguous, open space parcel of &gt;25.35ha will be provided along the Thornicroft Drain corridor. This does not include other green space on the subject lands such as parks and ponds.</p> <p>By maintaining and providing significant ecological improvements to the Thornicroft Drain corridor, the proponent will ensure the protection and enhancement of significant natural features within the subject lands. The improved Thornicroft Drain corridor will provide direct wildlife habitat, wildlife movement habitat, and robust protection to the hydrological system.</p> <p>Additionally, an extensive path and park system has been proposed within the development concept. The integration of these recreational components will provide a soft interface between natural features on the subject property and human use of the subject lands post-development.</p> |

| SOURCE OF IMPACT | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | NET EFFECTS & RATIONALE |
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|                  |                                              | <p>beneath Bostwick Road. Compensation for the construction of the SWM pond has not been proposed since the ecological function of the CUS1 community is limited and the SWM facility will be a naturalized dry pond that will provide habitat for wildlife. It is recommended that clean runoff from Block 52 be directed to TDT17 to maintain flows through this feature.</p> <p>Several areas of the FOD7-3 may be impacted in support of the extension of Kilbourne Road/ Hayward Parkway and construction of pedestrian walkways across the Thornicroft Drain. These areas are generally small in size and trees that are removed will be compensated for within the buffer exceedance areas along the Thornicroft Drain. Tree compensation requirements will be addressed at the focused design stage of the crossings, in alignment with City policies. The design of the crossing structures and proposed mitigation measures for these structures are discussed in greater detail below. Area compensation has not been proposed for these crossings.</p> <p>A small area of FOD7-3 woodland will be removed for the construction of the Block 87 SWM pond, as described in the EMP prepared by NRSI (2026b)</p> <p>The total area of vegetation removal for which compensation is proposed is 1.161ha, buffer exceedance areas along the Thornicroft Drain are 2.158ha allowing ample space to provide compensation.</p> <p>A comprehensive TIPP is to be prepared at the focused design stage. This preservation plan will identify trees to be retained and trees to be removed from the subject lands and will identify required compensation</p> |                         |

| SOURCE OF IMPACT | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | NET EFFECTS & RATIONALE |
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|                  |                                              | <p>planting quantities. Compensation requirements are generally one tree for every 10cm of DBH of tree removed for trees 50cm DBH or greater..</p> <p>Vegetation removal is recommended to occur outside of the breeding and nesting season for migratory birds as established by the Canadian Wildlife Service. The peak breeding period for birds in southern Ontario extends from April 1 through August 31 (CWS 2012). If vegetation clearing cannot be avoided during the core bird nesting season, a qualified avian biologist must be retained to carry out a nest search ahead of clearing activities within “simple” (i.e., non-forested) habitats. Vegetation clearing can only proceed if there are no active nests.</p> <p>A total of six candidate bat cavity roost trees were observed within areas with proposed vegetation removal. It is recommended that clearing be completed outside the active bat season which runs from April 1 to November 30. Another bat habitat assessment should be completed during the focused design stage during leaf-off conditions to determine if bat acoustic surveys are necessary.</p> <p>A Restoration Plan should be developed at the focused design stage to identify the locations of proposed buffer plantings as well as plantings within the buffer exceedance areas that have been identified for compensation. The restoration plan should use native trees, shrubs, and seed mixtures. The seed mixture should aim to include a variety of wildflower species which bloom throughout spring, summer, and fall. This Restoration Plan should be prepared as part of the Complete Corridor Plan and should be prepared in consultation with City of London and UTRCA staff.</p> |                         |

| SOURCE OF IMPACT    | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| 2.2 Wetland Removal | <p>Removal of wetlands can result in direct wildlife mortality, the removal of wildlife habitat, alter hydrologic flow patterns and change water balances. A small wetland inclusion is proposed for removal from within a FOD7-3 projection in the southern extent of the subject lands. Additionally, a small wetland will be removed in support of the 3080 Bostwick development (Stantec 2020, 2022). The following wetlands are proposed for removal:</p> <ul style="list-style-type: none"> <li>• MAM2-2 inclusion (0.176ha)</li> <li>• Bostwick MAM (0.20ha)</li> </ul> | <p>Wetlands within the subject lands have been retained and buffered wherever possible. Only a single small wetland inclusion has been proposed for removal from the subject lands. This feature is a Reed-canary Grass dominated marsh (MAM2-2) associated with an HDF, and is considered non-significant due to its small size, limited ecological function, and lack of SWH. The removal of this wetland will be compensated for within a block identified for wetland compensation at the far south end of the subject lands. In addition to the wetland proposed for removal from the subject lands, compensation will also be provided for a small (0.20ha) meadow marsh identified in the Bostwick EIS (Stantec 2018, 2020) within the Kilbourne and Westgate lands.</p> <p>The wetland that is proposed or construction will be located within Block 79 at the south end of the subject lands. The constructed wetland will be a total of 0.376ha in area so as to provide a greater than 1:1 compensation for the wetlands removed from both properties. Open space Block 79 is 0.360ha in size and incorporates a variable width buffer from the edge of the constructed wetland to the adjacent SWM pond and Bostwick Road. The proposed wetland will be located within the adjacent Thornicroft Drain corridor (outside of the woodland dripline). The total area of the constructed wetland and its associated buffer will be 0.573ha. The constructed wetland will be planted with a wide variety of native species and will include marsh and wetland thicket components to provide diverse wildlife habitat and ecological function.</p> <p>A design and planting plan for the constructed wetland should be developed at the focused design stage. This plan should identify the use of native plant species as described under Wetland Removal and Compensation,</p> | <p><u>No Net Effect</u></p> <p>The proposed construction of the compensation wetland will provide an area of wetland larger than the two wetlands that are proposed to be removed. The constructed wetland will provide a larger area of contiguous habitat in addition to a buffer area, not present for either of the removed wetlands, which abut active agricultural lands. Habitat within the constructed wetland is proposed to be of a higher quality than that present in the removed wetlands, with a high diversity of native plant species. The wetland will be located within the engineered floodplain for the Thornicroft Drain and will also receive flows from the proposed low flow channel described below.</p> <p>It can take several years for constructed wetlands to become established; for this reason, the impact has been considered to have no net effect. In the long-term it is anticipated that the constructed wetland will provide higher quality wildlife habitat and ecological functions than the wetlands proposed for removal.</p> |

| SOURCE OF IMPACT                          | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                                                                                                                                                                                                                                            | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                       |
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|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>or the closest equivalent available at the time of planting.</p> <p>The proposed wetland construction should be completed prior to the removal of the existing MAM2-2 feature.</p> <p>In order to prevent direct wildlife mortality during the removal of the MAM2-2 feature, a wildlife salvage should be undertaken within the wetland prior to it being filled. The wildlife salvage will be subject to appropriate permitting and wildlife should be relocated to the constructed wetland.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2.3 Headwater Drainage Feature Alteration | <p>The alteration of HDFs can result in impacts to hydrological flow patterns, changes to water balances and flooding if not correctly addressed. The following HDFs (evaluated as Protection, Conservation, or Mitigation) within the subject lands are proposed for realignment or removal and compensation:</p> <ul style="list-style-type: none"> <li>TDT1 (reach -1, -2, and -3): Conservation</li> <li>TDT5-2: Mitigation</li> <li>TDT17 (reach -1 and -2): Protection</li> </ul> | <p>All HDFs that have been identified for realignment or removal will be compensated for accordingly.</p> <p>TDT1 (reach -1, -2 and -3) is associated with the MAM2-2 wetland that has been proposed for removal from the Kilbourne and Westgate lands. The HDF will be graded and removed along with the wetland. In order to compensate for its removal, a low flow channel has been proposed for construction within Block 79 where the constructed wetland will be located. This low flow channel will function to direct drainage from the adjacent lands into the constructed wetland and will ensure that hydrological flow patterns remain the same on this portion of subject lands.</p> <p>TDT5-2 is located on the east side of the Thornicroft Drain and flows along the south side of the golf driving range before turning south within the CUM1 along the east side of the Thornicroft Drain. This HDF is identified for mitigation as it is a constructed feature with very limited ecological function. In order to mitigate the proposed removal of the feature, flows associated with it must be considered and either piped, or provided for in an open channel to ensure no</p> | <p><u>No Net Effect</u></p> <p>The results of the hydrogeological assessment were considered in conjunction with ecology through the headwater assessment. Through the implementation of the proposed mitigation measures and realignment or compensation for the removed or altered HDF, no net effects are anticipated. Hydrological and ecological functions will be maintained on the subject lands post-development.</p> |

| SOURCE OF IMPACT             | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                        | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | NET EFFECTS & RATIONALE                                                                                                                                       |
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|                              |                                                                                                                                                                                                                                                     | <p>alterations to hydrological regime or changes to water balance.</p> <p>TDT17 (reach -1 and -2) is located at the south end of the CUS1 community to the east of Bostwick Road. This HDF currently flows from the Westwinds property (MTE 2023a) underneath Bostwick Road, and along the southern edge of the CUS1 feature, discharging into Thornicroft Drain. Tributary to the west of Bostwick Road is proposed for realignment on the Westwinds Development property, and will flow through a culvert beneath Bostwick Road, entering a pipe which will be buried within the CUS1 community and outlet to the Block 86 SWM pond. As a result, TDT17 will be disconnected from off-site flows. Typically, removal is not suitable for Protection evaluated HDFs. In the case of TDT17, flooding is associated with reaches of the tributary to the west of Bostwick Road where it flows through a residential property. Realignment of the tributary outside the subject property will prevent flooding and provide an improved movement corridor for wildlife when considered with the proposed woodland corridor in the Westwinds Subdivision EIS (MTE 2023a). The drainage from the west side of Bostwick Road will be directed into the SWM facility (Block 86) to provide quantity control. It is recommended that clean runoff from Block 52 be directed to the existing TDT17 to maintain this feature.</p> <p>The appropriate outlet to Thornicroft Drain from the SWM facility must be determined through detailed design.</p> |                                                                                                                                                               |
| 2.4 Kilbourne Road Extension | Kilbourne Road/Hayward Parkway will be extended east-west across the Thornicroft Drain corridor. Impacts related to the removal of natural features associated with the drain are discussed above under vegetation removal. The construction of the | A comprehensive impact analysis for the construction of the proposed road extension should be completed at the focused design stage. This should involve a bridge hydrology study report that will include an environmental management plan (including any                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p><u>No Net Effect</u></p> <p>The proposed Kilbourne Road crossing is not anticipated to have any net effects, as long as the structure is appropriately</p> |

| SOURCE OF IMPACT                                    | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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|                                                     | road across the Thornicroft Drain corridor has the potential to disrupt wildlife movement along the corridor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>required compensation), construction methodology, and ESC measures for the implementation of the bridge crossing.</p> <p>The design of the road crossing should incorporate a large opening to allow wildlife to travel north-south along the corridor, unimpeded. The crossing should provide both wet and dry substrates for wildlife movement and should have an open bottom.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | designed and evaluated during the focused design stage. The proposed structure will be further evaluated through a comprehensive impact analysis once further details of its construction are understood.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 2.5 Protected Species and Protected Species Habitat | <p>Confirmed habitat for Butternut has been identified within the subject lands. Habitat for Butternut is protected under the SCA (2025). No harm is expected to occur to the identified Butternut or its habitat within the subject lands, as the proposed development is entirely outside of the Butternut's Root Harm Prevention Zone, 5m buffer, and 25m habitat area.</p> <p>Candidate habitat for Protected Species bats has been identified within treed communities on the subject lands. Several suitable bat roost trees were identified within areas of proposed tree removals through the completion of a bat habitat assessment. Further studies are expected to be required to determine if any harm will occur to Protected Species bats or their habitat as a result of the proposed development.</p> | <p>No authorizations under the SCA are expected to be required for the proposed construction in the vicinity of the Butternut on the subject lands. This has been described in detail within the Block 87 SWM Pond EMP prepared by NRSI (2026b).. It is recommended that a follow-up Butternut Health Assessment be conducted at the focused design stage to determine if the Category of the tree has changed.</p> <p>Additional bat habitat assessments and potential acoustic monitoring may be required to address candidate Protected Species bat habitat within the subject lands. A small number of candidate roost trees are present within the subject lands, where the proposed development will overlap treed areas. Future habitat assessments will determine if harm to Protected Species bats or their habitats are anticipated. Collected data will be used to determine if correspondence with the MECP is necessary to address Protected Species bat habitat within the subject lands. Any impacts to Protected Species bats are anticipated to be small in scale.</p> <p>At a minimum, vegetation removal should be conducted outside the bat active season (April 1 to November 30) to ensure that no direct mortality of Protected Species bats occurs.</p> | <p><u>Not Net Effect</u></p> <p>At this stage, no impacts to Protected Species or their habitat, or contravention of the SCA is anticipated as long as the recommended mitigation measures and assessments are implemented.</p> <p>It is anticipated that any impacts to Protected Species bats will be mitigated through the extensive plantings and improvements proposed along the Thornicroft Drain corridor. Bat roosting boxes will also be provided. Future habitat assessments will determine if harm to Protected bats or their habitat are anticipated. Collected data will be used to determine if correspondence with the MECP is necessary to address Protected Species bat habitat within the subject lands.</p> |

| SOURCE OF IMPACT                                                                                                                         | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                    | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                            |
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| <p>2.6 Site Grading</p> <p>*Grading limits have not been determined yet; however, the overall development limit has been identified.</p> | <p>Site grading has the potential to cut or compress tree root systems, change hydrological flow patterns, destabilize slopes, and remove wildlife habitat.</p> | <p>Grading will be limited to areas located outside of the proposed development limit, which has been designed to avoid natural heritage features and large buffers. Very limited areas of encroachment have been identified within the outer buffer; however, these will be offset through the buffer exceedance areas identified along the Thornicroft Drain corridor.</p> <p>Limits of development will be clearly demarcated to prevent encroachment into the surrounding natural features. These boundaries will be clearly marked using Erosion and Sediment Control (ESC) fencing. These measures are to be implemented to ensure any activities associated with the development are restricted outside of natural areas and their buffers. The fencing is to be installed prior to the commencement of construction with the exception of the removal of structures and impervious surfaces in the buffer which can occur prior to the fence being installed.</p> <p>Clean equipment protocol to be followed.</p> <p>A TIPP is to be prepared at the focused design stage. The TIPP will identify the location of Tree Protection Fencing to ensure that site grading does not impact tree root zones.</p> <p>Hydrological patterns will be maintained, as per the FSWMR prepared by Stantec (2025).</p> <p>A detailed ESC Plan as per the City of London Design Standards Requirements (2019) should be prepared and implemented.</p> | <p><u>No Net Effect</u></p> <p>Impacts related to grading are expected to be minimized and low in impact due to the mitigation measures proposed. ESC measures and sediment control facilities will be provided in all areas and phases where grading, servicing and construction is proposed.</p> |
| <p>2.7 Buffer Encroachment</p>                                                                                                           | <p>Minor encroachments into the outer buffer area have been identified in the Buffer Analysis section. These encroachments are generally small in area</p>      | <p>The identified buffer encroachments are all minor in scale. Buffer exceedance along the Thornicroft Drain corridor is equivalent to 2.158ha. After compensation</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p><u>(+) Net Positive Effect</u></p>                                                                                                                                                                                                                                                              |

| SOURCE OF IMPACT         | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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|                          | <p>and extent, and are often associated with areas where crossings are proposed over the Thornicroft Drain. Small areas of buffer encroachment have also been identified for vegetation patch #10065. Total buffer encroachments identified within the subject lands are:</p> <ul style="list-style-type: none"> <li>FOD7-3 (along Thornicroft Drain): 0.197ha</li> <li>FOD6-5 (patch #10065): 0.071ha</li> </ul> <p>Encroachments into buffer areas can result in increased edge effects during and post-construction.</p> | <p>is provided for direct vegetation removals, an area of 0.997ha of buffer exceedance will still be available within the corridor. This area will more than compensate for the proposed 0.197ha of buffer encroachment.</p> <p>A small area of buffer exceedance has also been identified along the southern edge of the patch #10065 woodland, and consists of an area of 0.082ha and will provide adequate compensation for the 0.071ha of buffer encroachment associated with this woodland.</p> <p>A Restoration Planting plan should be developed for buffer areas at the focused design stage, as a component of the overall Complete Corridor Design. Vegetation should consist of native plants that are present within adjacent vegetation communities, and consider supplementation to increase biodiversity where needed with other locally native species.</p> <p>In order to prevent edge effects and additional encroachment into buffer areas during construction, the limit of development should be demarcated in the field.</p> <p>No equipment or construction materials are to be stored within buffers.</p> | <p>Buffer encroachments are very limited within the subject lands, particularly when compared to the area of buffer exceedance that has been provided along the Thornicroft Drain corridor. Through the revegetation of established buffer areas and delineation of the limit of development in the field, no negative impacts are anticipated.</p> <p>The large quantity of buffer exceedance along the Thornicroft Drain corridor will result in a net positive effect once planted within native vegetation.</p> |
| 2.8 Damage to Vegetation | <p>Damage to trees and vegetation adjacent to the proposed development area can occur during construction activities. This can result in scarring and damage to vegetation by machinery, the decreased health of vegetation from dust and sedimentation, and the introduction of non-native species.</p>                                                                                                                                                                                                                    | <p>Implementation of the buffers identified on Map 8a and 8b, and delineation of their boundaries with ESC fencing, tree protection fencing or other visual markers will prevent encroachment into these areas and limit the potential for unintended vegetation damage.</p> <p>A TIPP will be prepared at the focused design stage and will identify locations where tree protection fencing will be installed to prevent damage to trees adjacent to the development area or proposed for retention.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p><u>No Net Effects</u></p> <p>Through the implementation of the recommended mitigation measures, damage to vegetation will be limited to the greatest extent possible. No net effects are anticipated.</p>                                                                                                                                                                                                                                                                                                        |

| SOURCE OF IMPACT                                                                                                                                                                         | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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|                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Development and implementation of ESC plan.<br><br>The City of London's Clean Equipment Protocol should be followed to minimize the spread of invasive species.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2.9 Machinery Maintenance                                                                                                                                                                | Maintenance and refueling of construction machinery and equipment can result in the potential contamination of soils, vegetation and water.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | All machinery maintenance should be completed in designated areas away from natural features and buffers, and at a high elevation point on-site where possible.<br><br>Best Management Practices are to be implemented during construction these include: <ul style="list-style-type: none"> <li>• Development of a spill action response plan; and</li> <li>• Development of a spill contingency plan for fuel handling, storage, and on-site equipment maintenance activities.</li> </ul> Contractors on-site should ensure construction equipment is in good working order. Equipment operators should have spill prevention kits available.                                                                                                                                                                                                                    | No Net Effect<br><br>All potential impacts relating to machinery and equipment maintenance can be mitigated through the implementation of the detailed measures and Best Management Practices.                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>3.0 Indirect Impacts:</b>                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3.1 Hydrological Changes – SWM and Water Balance<br><br>Functional Stormwater Management Report provides additional information (Stantec 2025).<br><br>Hydrogeological Report (EXP 2024) | Changes to stormwater drainage on the subject lands can result in impacts to wetland features, the Thornicroft Drain, as well as off-site wetlands, watercourses and other natural features. The impacts have the potential to result in increased surface water runoff, decreases to water quality, and changes to water balance.<br><br>The feature-based water balance assessment prepared by EXP identifies that runoff contributed to the wetlands (SWD2-2) within the northwestern woodland (Catchment A) will be reduced by 30% from pre-development conditions, while the wetland (MAM2-2 / SWD4-1) located along the Thornicroft Drain (Catchment B) will be reduced by 68% from pre-development conditions. | On-site SWM quantity controls are proposed for implementation. The subject lands have been divided into four catchment areas, three off-site catchment areas will also be serviced by on-site SWM facilities. The post-development catchment areas proposed will be the same as the pre-development catchment areas for the site. A total of four on-site SWM ponds are proposed for the development area. The FSWMR prepared by Stantec (2025) identifies that adequate area is available within the SWM blocks that have been identified on the concept plan to attenuate flows for the 2-year to 100-year design storms. LID measures have been proposed for the development area and include shallow turfed depressions in boulevards to infiltrate stormwater, stormwater exfiltration systems, and oil/grit separators upstream of the SWM facilities. These | <u>To be determined. The goal: No Net Effect</u><br><br>Based on the FSWMR, proposed SWM strategy (Stantec 2025) and Hydrogeological Assessment (EXP 2024), no long-term negative effects are anticipated as they relate to water quantity and quality impacts. The proposed SWM dry ponds will provide sufficient space to attenuate stormwater flows to pre-development rates. Quality controls will be implemented to ensure water quality meets the required 80% TSS removal. Infiltration measures have been proposed on-site to promote infiltration of water wherever possible. |

| SOURCE OF IMPACT | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                               | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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|                  | <p>Construction activities can result in contamination of surface water features. These impacts are short term and can be minimized through the implementation of mitigation measures.</p> | <p>proposed measures will infiltrate water on-site and act as water quality controls to ensure that the target of 80% TSS removal is achieved. The FSWMR (Stantec 2025) also notes that the inclusion of the additional infiltration measures in the SWM strategy will be explored at the focused design stage.</p> <p>Further analysis should be completed as part of the hydrogeological assessment to confirm that the calculated post-construction water balances are accurate. This should include an analysis and quantification of surface runoff contributions from the 3080 Bostwick Road development and other development blocks to the wetlands associated with Catchment A. It should also include an assessment of the flows contributed to the wetlands in Catchment B from the Thornicroft Drain. Regardless of the conclusion of the additional water balance analysis, it is recommended that the infiltration measures suggested in the FSWMR be implemented in the detailed SWM design for the subject lands to ensure post-construction water balance matches pre-construction levels. Additional measures such as the collection of rooftop runoff or contribution of flows through spreader swales from the dry SWM ponds to wetlands on the subject lands should be considered to ensure post-development water balance is consistent with pre-development conditions.</p> <p>Construction-stage measures should be implemented to ensure that sediment, spills, debris, and other deleterious substances are prevented from migrating off-site into the adjacent watercourse and wetland features. These measures should be incorporated into an ESC Plan for the development once it has been prepared.</p> | <p>A final SWM plan should be developed at the focused design stage and impacts re-evaluated to ensure no net negative effect is anticipated.</p> <p>Water balance calculations and mitigation measures are to be updated and addressed through focused design studies as a Draft Plan condition. Post-construction water balance for the wetlands on site should be within (+/-) 10% of the pre-development conditions. This should be achievable through the use of LID measures and by enhancing surface water contributions to Catchments A and B.</p> |

| SOURCE OF IMPACT                                                             | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| 3.3 Impacts / Disturbance to Adjacent Natural Features and Wildlife Habitats | <p>Indirect disturbances can cause stress on the natural features that weaken their ecological integrity. In these states, natural features are more prone to establishment and proliferation of invasive, non-native species. Proliferation of invasive, non-native species within natural communities decreases their ecological value by suppressing native species, diminishing biodiversity, and reducing habitat suitability.</p> <p>Increased disturbance of wildlife caused by excessive noise, dust, vibrations, lighting, and proximity of human presence during and following construction may cause certain species to abandon or avoid the area for travel, foraging, or nesting. Additionally, these disturbances may disrupt or discourage breeding birds from nesting within the vicinity.</p> | <p>Limits of development will be clearly demarcated to prevent encroachment into the surrounding natural features. Large buffer areas have been included in the Natural Heritage System to protect natural features.</p> <p>To avoid and minimize potential for invasive, non-native species, clean equipment protocol to be followed, restoration of the buffer and management of existing non-native species to be implemented.</p> <p>In order to suppress dust, areas of bare soil should be moistened with water during construction activities to ensure that the amount of dust within the subject lands is reduced. Topsoil stockpile locations should be in areas of lesser wind exposure and away from natural features and their buffers.</p> <p>Impacts resulting from increased noise and vibration can be mitigated by restricting the daily timing of construction activities to between 7:00am and 7:00pm. All lighting equipment associated with construction should be turned off during non-operational hours or at the very least should be directed away from adjacent natural features to prevent “lightwash” of these areas. Lighting of houses, yards, and streets should also be directed away from the Natural Heritage System.</p> <p>Rear yards should be fenced without gates where they border the Natural Heritage System.</p> | <p><u>No Net Effect</u></p> <p>Through the implementation of the proposed mitigation measures impacts resulting from construction related dust, noise, and vibrations are expected to be temporary, minimal, and localized during the construction of the proposed development. Significant effects on wildlife are not anticipated, and it is expected that displaced wildlife species adjacent to the site will return to the vicinity of the subject lands following construction.</p> <p>Directional lighting, construction schedules, soaking exposed soils should effectively ensure that there are no significant net impacts.</p> |
| 3.4 Erosion and Sedimentation<br>*During construction phase                  | <p>During construction, areas of bare soil may be exposed that have the potential to erode during precipitation events and impact adjacent natural features. In the event of a heavy rain or snow melt event, sediment laden runoff can enter adjacent natural areas by way of overland flow.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>ESC fencing will be required as part of an ESC Plan.</p> <p>Disturbed areas should be kept to a minimum and re-vegetated in a reasonable timeframe in order to minimize dust and erosion.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p><u>Not Net Effect</u></p> <p>Through the design and implementation of a proper ESC plan, no significant net impacts are expected due to erosion and sedimentation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| SOURCE OF IMPACT                                        | POTENTIAL AREAS AFFECTED & POTENTIAL EFFECTS                                                                                                                                                                                                                     | AVOIDANCE, MITIGATION, COMPENSATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | NET EFFECTS & RATIONALE                                                                                                                                                                                                                                                                                        |
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|                                                         |                                                                                                                                                                                                                                                                  | Inspection and maintenance of the installed ESC measures throughout the duration of construction, to ensure they are functioning as originally intended.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                |
| 3.5 Use of natural areas as a result of the development | Natural features and proposed buffers that are located adjacent to the development area can be impacted through increased use of a natural area by residents or users of the property, feral and domestic wildlife, and unauthorized trail/pathway construction. | <p>Permanent fencing with no gates should be installed along the rear yards of lots that back onto natural features and buffer areas.</p> <p>Pedestrian walkways and trails have been proposed for the proposed development. These trails will provide controlled access to natural areas by residents and users of the site. The establishment of these walkways will effectively reduce the potential for ad-hoc trail creation.</p> <p>An educational brochure should be considered for circulation to residents to inform them of the significance of the natural features and species in the area and what they can do to reduce the potential for impacts (e.g., dumping of yard waste, encroachments, pet waste, pets roaming free, etc.).</p> <p>Educational signage along the trails is encouraged, as well as signs requesting trail users to stay on the trail, not pick wildflowers, not to dump yard waste, etc.</p> <p>The increase in noise, human presence and artificial lighting resulting from the proposed residential development can disrupt or deter wildlife from inhabiting the treed features on site. It is recommended that low intensity, downward-projected lighting be installed for street light standards to reduce the effects of lightwash.</p> | <p><u>Not Net Effect</u></p> <p>Through the correct use of these mitigation measures, it is anticipated that the effects of the induced impacts will be small in magnitude. These impacts have the potential to be permanent, although they can be reduced at any point through education and enforcement.</p> |

## **8.0 Environmental Management Recommendations**

### **8.1 Planning and Design Stage**

1. A grading plan for the proposed development will be developed at the focused design stage.
2. Phasing of the proposed development, as identified in the FPR, should be adhered to and align with the recommendations provided in this EIS.
3. A TIPP should be prepared to address proposed tree removals from the subject lands and to determine compensation requirements. The TIPP will also identify the location of Tree Protection Fencing.
4. Additional bat habitat assessments and potential acoustic monitoring should be undertaken for Protected Species bats at least one year prior to tree removals to ensure that no harm will occur to Protected Species bats or their habitat, resulting in contravention of SCA. Artificial bat roost sites are recommended to be installed within the Natural Heritage System to reduce impact to Protected Species bats.
5. Completion of a follow-up Butternut Health Assessment to determine if the Butternut on-site is still a Category 2 tree. Registration under the SCA is not anticipated to be required as proposed construction activities are located outside of the habitat area of the Butternut (NRSI 2026b).
6. A detailed SWM Plan is to be developed at the focused design stage. This plan should identify specific stormwater quantity and quality controls, and promote infiltration on-site. The SWM Plan is to address maintenance of the TDT17 HDF through contribution of clean runoff from Block 52. An updated water balance calculation should be provided as part of this plan to ensure that no negative changes to water balance will occur as a result of the proposed development.
7. A Restoration Plan will be developed at the focused design stage. This plan will include a planting plan for the buffer areas and buffer exceedance areas within the subject lands and will include native species that have been found within the Thornicroft Drain Corridor. The planting plan will incorporate compensation for the removal of the identified vegetation communities, tree removals (as specified in the TIPP), and enhancement plantings within the buffer areas. The Restoration Plan should be prepared as a component of the overall Complete Corridor Design Plan.
8. A detailed design plan should be developed for the constructed wetland proposed in Block 79 of the development concept. This plan should address hydrologic

requirements for the wetland and proposed low flow channel. It should also include a planting plan for the wetland as well as its associated buffer area. The proposed plantings should include the native species that are listed above under Wetland Removal and Compensation, or the closest available equivalents. The development of the wetland design should be completed as a component of the overall Complete Corridor Design Plan.

9. A detailed design of the crossing structures proposed for the Kilbourne Road/Hayward Parkway extension and pedestrian walkway over the Thornicroft Drain should be developed. The proposed design should allow for wildlife movement. An impact analysis should be completed for these structures to ensure that they function as intended and do not impede the movement of terrestrial and aquatic wildlife along the Thornicroft Drain corridor.
10. An Environmental Monitoring Plan (EMP) should be developed to identify monitoring requirements during and post-construction. The EMP should be developed in conjunction with the first submission of engineering drawings and will identify a 5-year detailed monitoring program for natural heritages features and functions. The requirements are anticipated to include monitoring of mitigation measures installed within the subject lands during construction. Post-construction monitoring is expected to include monitoring of plantings within the buffer and buffer exceedance areas as well as the constructed wetland, to the satisfaction of the City. An annual monitoring report shall be provided each year of the program to the City's Ecologist.
11. A detailed ESC plan should be developed by a qualified engineer for implementation during construction. This plan should include all proposed ESC measures, including but not limited to ESC fencing, straw bales and check dams.
12. The Thornicroft Drain shall be conveyed to the City of London following the completion of volumetric and wetland compensation. Remediation works in the Thornicroft Drain will be undertaken by the City, and not as an obligation to this Draft Plan.

## **8.2 Construction Stage**

13. ESC fencing is to be installed along the entirety of the development limit to prevent erosion and sedimentation and to demarcate the development area in the field.
14. ESC measures on the subject lands will require certification by the Contract Administrator and the construction monitoring program will be maintained during site

development, until 70% buildout. This will not be restricted to the establishment of ESC controls, but to on-going maintenance such as active lot drainage control, street sweeping, stockpile seeding, etc.

15. A combined ESC fence and tree protection fence is recommended where trees are situated along the development limit. The installation and location of the tree protection fence is to be inspected by a Certified Arborist before any construction activities begin, and maintained by the developer during the entire construction period. Any minimal damage (i.e., damage to limbs or roots) to trees to be retained during construction must be pruned using proper arboricultural techniques. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, consultation with the City will be required. More information regarding tree protection fencing will be provided in the TIPP that is to be developed at the focused design stage.
16. The constructed wetland should be implemented prior to the removal of the MAM2-2 feature within the subject lands.
17. To prevent direct wildlife mortality during the removal of the MAM2-2 feature, a wildlife salvage should be undertaken within the wetland prior to it being filled. The wildlife salvage will be subject to appropriate permitting and should be relocated to the constructed wetland. A wildlife salvage should also be completed prior to removal of the pond on the golf driving range lands.
18. Stabilization and re-vegetation of bare soil areas after grading should be completed as soon as possible.
19. Tree and vegetation removals should be restricted to outside the peak breeding season window for migratory birds (April 1- August 31) and the active season for bats (April 1 – November 30).
20. A spill action response plan and spill contingency plan should be developed prior to the initiation of construction activities.
21. The City of London's Clean Equipment Protocol should be followed to minimize the spread of invasive species.
22. In order to suppress dust, areas of bare soil should be moistened with water during construction activities to ensure that the amount of dust within the subject lands is reduced.
23. Topsoil stockpile locations should be in areas of lesser wind exposure and away from natural features and their buffers.

24. Construction activities should be restricted to 7:00am to 7:00pm, with artificial lighting turned away from natural features.
25. The design of directional lighting fixtures should be compliant with IDA Dark Sky standards.

### **8.3 Post-Construction Stage**

26. Stabilization and re-vegetation of bare soil areas after construction is complete should be completed as soon as possible. Vegetation should not be used as a stabilization method in the summer and winter months, other stabilization methods should be used until planting conditions are appropriate.
27. Tree protection and ESC fencing should be removed upon completion of construction activities. A Certified Arborist should be on site to monitor the removal of the TPF and inspect retained trees and their rooting area. Possible remediation work may be needed if retained trees or root zones are damaged.
28. Promote environmental stewardship awareness through provision of an environmental guide/brochure that contains a list of recommendations (i.e. dos and don'ts) to avoid/minimize residual impacts (i.e. control pets, avoid tree removals, avoid use of pesticides and toxic materials, use of invasive plant species/native species alternatives).
29. Install educational signage along the trail system to promote environmental stewardship and education. "Stay on the trail" signs should be installed.
30. A 2-year monitoring plan, as described in the proposed EMP, should be implemented to observe survival of planted trees and vegetation within the buffer and buffer exceedance areas of the subject lands.
31. A comprehensive 5-year monitoring plan, as described in the EMP, should be implemented to assess the establishment of the constructed wetland and to ensure that the proposed residential development has no negative impacts on surrounding natural features and buffer areas post-construction and post-development.

## 9.0 Summary

NRSI was retained in April 2019 by Kilbourne Developments and Westgate Developments (London) Inc., care of York Developments to complete an EIS for a proposed development in the southwest of London. The proposed development includes a mixture of low, low to medium, medium, and medium to high residential density blocks as shown in Appendix XIII (MHBC 2025). The Draft Plan also includes park and open space blocks, SWM blocks and the associated roads, road widening, and walkways.

The subject lands are approximately 85ha in size. The lands currently consist of annual row crop fields, a woodland in the northwest, and the Thornicroft Drain and associated riparian habitat that crosses the property in a north-south direction (Map 1). A golf driving range and industrial lands are present in the southern portion of the subject lands as well as a former residential site that fronts onto Bostwick Road. The subject lands are located within the Dingman Creek subwatershed and are within Ecoregion 7E.

Based on the results of background reviews and field surveys, this study found that several significant and sensitive natural features are present within the subject lands. Several non-significant wetlands are present within the subject lands. The large woodland in the northwest of the subject lands, as well as woodlands along the Thornicroft Drain have been identified as significant in accordance with the London Plan. A CUS1 community within the subject lands meets the City's definition of significance, but has been considered to not be significant based on the definition of woodland provided in the PPS (2020), ELC manual (Lee et al. 1998), and the Forestry Act (1990). Significant Valleyland is present along the Thornicroft Drain. The Thornicroft Drain provides direct fish habitat and is an important movement corridor for wildlife across the local landscape. Several HDFs require Conservation or Protection within the subject lands.

Habitat for a single Butternut, Endangered, was identified from the subject lands, and woodlands within the subject lands have been considered to provide candidate habitat for Protected Species bats. SWH has been confirmed for a rare vegetation community (FOD7-4), Terrestrial Crayfish, Western Chorus Frog, and Eastern Wood-Pewee. Candidate SWH has been identified for Bat Maternity Colonies and Reptile Hibernacula. Additionally, regionally significant vascular plants species have been identified from vegetation communities within the subject lands.

Comprehensive buffers have been identified for significant and sensitive natural features within the subject lands. A minimum corridor width of 60m has been established for the Thornicroft corridor. This includes buffer exceedance areas where the proposed development limit is located beyond the identified natural heritage buffers. Several small vegetation communities and portions of vegetation communities are proposed for removal from the subject lands in support of the proposed development. The removal of treed vegetation communities will be compensated for within the identified areas of buffer exceedance and restoration plantings will be provided in buffer areas to provide a robust corridor for the Thornicroft Drain. A small MAM2-2 community is also proposed for removal from the subject lands, which will be compensated for at a >1:1 ratio in a constructed wetland block proposed at the south end of the subject lands.

A Net Effects Assessment was completed for the proposed development which considered the source of the impacts, potential areas affected, and potential effects. Avoidance, mitigation, and compensation measures were identified and the overall net effects and rationale provided. As demonstrated in the Net Effects Assessment table, assuming the recommended avoidance, mitigation and compensation measures are implemented properly, no negative impacts on the natural features or on their ecological functions should occur. In addition, a significant net positive effect will be provided for the Thornicroft Drain corridor through the widening of the corridor to a width  $\geq 60\text{m}$  along the length of the watercourses that flows through the subject lands. Through the addition of planted buffer areas and additional buffer exceedance areas, these improvements will result in a more robust and higher quality corridor.

At this stage of the proposed project, the intent and all requirements of the environmental policies of the City of London Plan, PPS, and other relevant legislation have been met (see Table 1). Recommendations are provided within this report for the focused design stage of the development to ensure that all relevant policies and regulations continue to be met as recommended.

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**Maps**

**Appendix I**  
**Comment Response Table**

## **Appendix II**

### **Issues Summary Checklist and Agency Approval**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsl.on.ca](mailto:driley@nrsl.on.ca) for further description or details of these documents at any time.

The first document is the original Environmental Study Scoping Checklist which outlines the information to be considered in the EIS.

The second document is the associated emails regarding the scoping checklist and the approval of the document.

### **Appendix III**

#### **Species at Risk and Species of Conservation Concern Screening**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsl.on.ca](mailto:driley@nrsl.on.ca) for further description or details of these documents at any time.

## **Appendix IV Significant Wildlife Habitat Screening Tables**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsl.on.ca](mailto:driley@nrsl.on.ca) for further description or details of these documents at any time.

**Appendix V**  
**Ecological Land Classification Field Forms**

## **Appendix VI** **Vascular Plant Species Observed from the Subject Lands**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsl.on.ca](mailto:driley@nrsl.on.ca) for further description or details of these documents at any time.

## **Appendix VII**

### **Bird Species Observed from the Subject Lands**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsi.on.ca](mailto:driley@nrsi.on.ca) for further description or details of these documents at any time.

## **Appendix VIII**

### **Herpetofauna Species Observed from the Subject Lands**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsi.on.ca](mailto:driley@nrsi.on.ca) for further description or details of these documents at any time.

## **Appendix IX Mammal Species Observed from the Subject Lands**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsi.on.ca](mailto:driley@nrsi.on.ca) for further description or details of these documents at any time.

## **Appendix X**

### **Management Guidelines for Headwater Drainage Features**

## **Appendix XI**

### **Photo Appendix of Headwater Drainage Features on Subject Lands**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsi.on.ca](mailto:driley@nrsi.on.ca) for further description or details of these documents at any time.

## **Appendix XII Significant Woodland Evaluation Forms**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsi.on.ca](mailto:driley@nrsi.on.ca) for further description or details of these documents at any time.

### **Appendix XIII**

#### **Proposed Draft Plan of Subdivision – Kilbourne and Westgate Lands**

The following appendix contains documents that are difficult to make screen reader accessible. Please contact Dan Riley at [driley@nrsi.on.ca](mailto:driley@nrsi.on.ca) for further description or details of these documents at any time.