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Detailed Environmental Impact Statement
Kanata Highlands Phase 1

December 2016

Prepared for Richcraft Homes Inc.

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EXECUTIVE SUMMARY

McKinley Environmental Solutions (MES) was retained by Richcraft Homes Inc. to prepare a Detailed Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed development of the Kanata Highlands Phase 1 property in Kanata (Ottawa), Ontario (the Site). The EIS and TCR are presented as an integrated submission and should be read together.

The Kanata Highlands Phase 1 property (the Site) is located in Kanata (Ottawa), Ontario and is approximately 25.6 ha in size. The Site is currently zoned Development Reserve and is vacant. Historically portions of the Site were farmed, and currently the Site is occupied by a mixture of Cultural Meadow, Cultural Thicket, a small Deciduous Swamp, and Deciduous Forest. The Site is bounded along its western side by Terry Fox Drive. The Richardson Ridge Phase 4 development is in the late stages of subdivision approval, and is located along the southern Site boundary. The eastern edge of the Site is bounded by the unopened First Line Road Allowance, beyond which is the KNL Phase 7 development. KNL Phase 7 is also in the late stages of subdivision approval. Both Richardson Ridge Phase 4 and KNL Phase 7 are anticipated to commence tree clearing and development activities in 2017, and so the majority of the area south and east of the Site is anticipated to be under development prior to the commencement of work in Kanata Highlands Phase 1. Therefore, the majority of the area south and east of the Site will be developed in future, although adjacent retained open space blocks will be preserved in both of the adjacent subdivision. The area north of the Site includes a triangular shaped parcel owned by the City of Ottawa.

The Site will be developed as a subdivision with approximately 159 single and 276 townhome and back-to-back units, for a total of approximately 435 residential units. The subdivision will also include an approximately 0.9 ha park block, and an approximately 6.5 ha open space block in the northern part of the Site. A 19 m wide open space block will also be retained along the edge of the First Line Road Allowance, in order to provide a wildlife movement corridor. This block will be approximately 0.5 ha in size, so the total open space dedication is approximately 7 ha. The Site will be serviced with municipal sewer and water. Stormwater servicing will be provided in the short term by conveying flows from the southern part of the Kanata Highlands Phase 1 Site to the oil and grit separator system that will be built in Richardson Ridge Phase 4. Ultimately, stormwater management for the Kanata Highlands Phase 1 Site will be provided by a new stormwater management pond that is to be built in the Area 2 lands west of Terry Fox Drive, outside of the 100 year floodplain of the Carp River.

Several designated natural habitats exist in the vicinity of the Site. There is a small wetland area at the northern edge of the open space block within the Site, beyond which is Shirley's Brook. These features are located well within the proposed open space block, and are more than 250 m from the

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proposed development edge. Therefore, no significant negative impacts on the wetland and Shirley's Brook are anticipated. There is a small channel in the western part of the Site which flows into a stormwater easement and culvert under Terry Fox Drive. This stormwater easement and culvert were established as a temporary measure during the construction of Terry Fox Drive, and were to be retained only until development of the area east of Terry Fox Drive was complete. Following subdivision development, the culvert will no longer be required for either wildlife movement or for conveyance of surface drainage. As such, the stormwater easement is scheduled to be transferred for development prior to registration. The channel is not considered a significant aquatic habitat feature, and so transfer and development of the stormwater easement is not expected to result in a significant negative environmental impact. A follow-up Headwater Drainage Assessment will be completed in early 2017 to provide additional information on this feature.

The majority of the Site is currently forested. The proposed extent of tree retention is anticipated to preserve the significant features and functions of the woodlot. The arrangement of the open space blocks will ensure that a portion of the interior forest habitat within the Site is protected, and the critical buffer areas around adjacent features (e.g. Shirley's Brook and the Deciduous Swamp in the northern part of the Site) will also be preserved (as noted above). The major linkage function of the Site will be maintained by the arrangement of retained blocks along the First Line Road Allowance, which will provide a connection to adjacent natural areas. In addition, the passive recreational functions currently provided by the woodlot will continue to be provided by the 7 ha of retained open space areas, which will be transferred to the City of Ottawa following development. It is therefore anticipated that the currently proposed 7 ha of open space dedication will be sufficient to preserve the significant features and functions of the woodlot.

Several Species at Risk (SAR) are known to occur in the vicinity of the Site. Portions of the Site meet the definition of Category 3 Blanding's Turtle (threatened) habitat due to the Site's proximity to wetland areas (located on adjacent properties). However, it should be noted that the four year radio telemetry study completed in the area by Dillon Consulting did not document any occurrences of Blanding's Turtle within the Site, and there are no known areas of Category 1 or 2 Blanding's Turtle habitat within Kanata Highlands Phase 1. Several Butternut Trees (endangered) were also noted within the Site, and a follow-up Butternut Health Assessment (BHA) is scheduled to be completed in May 2017. Following completion of the BHA, the proponent will contact the OMNRF to discuss potential impacts to Blanding's Turtle and Butternut Trees, in order to determine whether an authorization for the development is required under the Ontario Endangered Species Act (ESA). Requirements for these species will be fulfilled in compliance with the rules and regulations of the ESA. Mitigation measures have been proposed to avoid impacts to the individuals of these species.

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Wood Thrush and Eastern Wood Pewee, which are both species of special concern, were observed within the forested area of the Site. The habitat of these species is not regulated under the ESA, although mitigation measures have been proposed to avoid impacts to the individuals of these species. As noted above, the proposed 7 ha of open space dedication is anticipated to preserve the significant features and functions of the woodlot, including a sufficient portion of the forested habitat so that Eastern Wood Pewee and Wood Thrush are likely to continue to be found in the area following development.

Pending that the mitigation and avoidance measures outlined in this report are implemented appropriately, the proposed development is not anticipated to have a significant negative effect on the natural features and functions.

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1.0 INTRODUCTION

1.1 Scoping the Environmental Impact Statement

This EIS was undertaken following the City of Ottawa's Environmental Impact Statement Guidelines. Following the City guidelines, the Environmental Impact Statement (EIS) includes the following:

- Documentation of existing natural features on and around the Site;
- Identification of potential environmental impacts of the project;
- Recommendations for ways to avoid and reduce any negative impacts; and
- Proposal of ways to enhance natural features and functions.

This EIS was prepared with guidance from the *Natural Heritage Reference Manual* (OMNRF 2005). The major objective of this EIS is to demonstrate that the proposed project will not negatively affect the significant features and functions of the study area, and that impacts will be minimized through mitigation measures.

1.2 Site Overview

The Kanata Highlands Phase 1 property (the Site) is located in Kanata (Ottawa), Ontario and is approximately 25.6 ha in size. The Site is currently zoned Development Reserve and is vacant. As discussed below in Section 3.0, historically portions of the Site were farmed. The Site is now occupied by a mixture of Cultural Meadow, Cultural Thicket, Deciduous Swamp, and Deciduous Forest (discussed below). The legal land description of the Site is Part of Lot 8, Concession 1, Geographic Township of March, City of Ottawa.

As shown in Figure 1, the Site is bounded along its western side by Terry Fox Drive. The Richardson Ridge Phase 4 development is in the late stages of subdivision approval, and is located along the southern Site boundary. The eastern edge of the Site is bounded by the unopened First Line Road Allowance, beyond which is the KNL Phase 7 development. KNL Phase 7 is also in the late stages of subdivision approval. Both Richardson Ridge Phase 4 and KNL Phase 7 are anticipated to commence tree clearing and development activities in 2017, and so the majority of the area south and east of the Site is anticipated to be under development prior to the commencement of work in Kanata Highlands Phase 1. Therefore, the majority of the area south and east of the Site will be developed in future, although adjacent retained open space blocks and other habitat features will be present in both of the adjacent subdivisions. The area north of Site includes a triangular shaped parcel owned by the City of Ottawa, through which Shirley's Brook passes.

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1.3 Description of Undertaking

The Site will be developed as a subdivision with approximately 159 single and 276 townhome and back-to-back units, for a total of approximately 435 residential units. The subdivision will also include an approximately 0.9 ha park block, and an approximately 6.5 ha open space block in the northern part of the Site. A 19 m wide open space block will also be retained along the edge of the First Line Road Allowance, in order to provide a wildlife movement corridor. This block will be approximately 0.5 ha in size, so the total open space dedication is approximately 7 ha. The Site will be serviced with municipal sewer and water. Tree retention requirements are discussed in the attached Tree Conservation Report (Appendix A) and will include tree retention throughout the 7 ha of open space dedication.

A small stormwater easement and culvert under Terry Fox Drive is present in the western part of the Site. This stormwater easement and culvert were established as a temporary measure during the construction of Terry Fox Drive, and were to be retained only until development of the area east of Terry Fox Drive was complete. Following subdivision development, this culvert will no longer be required for either wildlife movement or for conveyance of surface drainage. As such, the stormwater easement is scheduled to be transferred for development prior to registration. Street #1 in the southern part of the Site will be shared with the adjacent Richardson Ridge Phase 4 subdivision, and will be built prior to the remainder of the Kanata Highlands Phase 1 development. Stormwater servicing will be provided in the short term by conveying flows from the southern part of the Kanata Highlands Phase 1 Site to the oil and grit separator system that will be built in Richardson Ridge Phase 4. Ultimately, stormwater management for the Kanata Highlands Phase 1 Site will be provided by a new stormwater management pond that is to be built in the Area 2 lands west of Terry Fox Drive, outside of the 100 year floodline of the Carp River.

1.4 Agency Consultation

A pre-consultation meeting was held by the City of Ottawa on November 24th, 2016. Comments related to the Detailed EIS requirements were provided by Matt Hayley (Environmental Planner) and Nick Stow (Natural Heritage Systems). Matt Craig of the Mississippi Valley Conservation Authority (MVCA) provided written comments to the City. An Information and Records Request Response was received from the Ontario Ministry of Natural Resources and Forestry (OMNRF) in 2011 (Refer to Appendix D). An updated Information and Records Request was submitted to the OMNRF in November 2016, although a response had not yet been received at the time of report preparation. The updated 2016 Information and Records Request Response will be forwarded to the City upon receipt.

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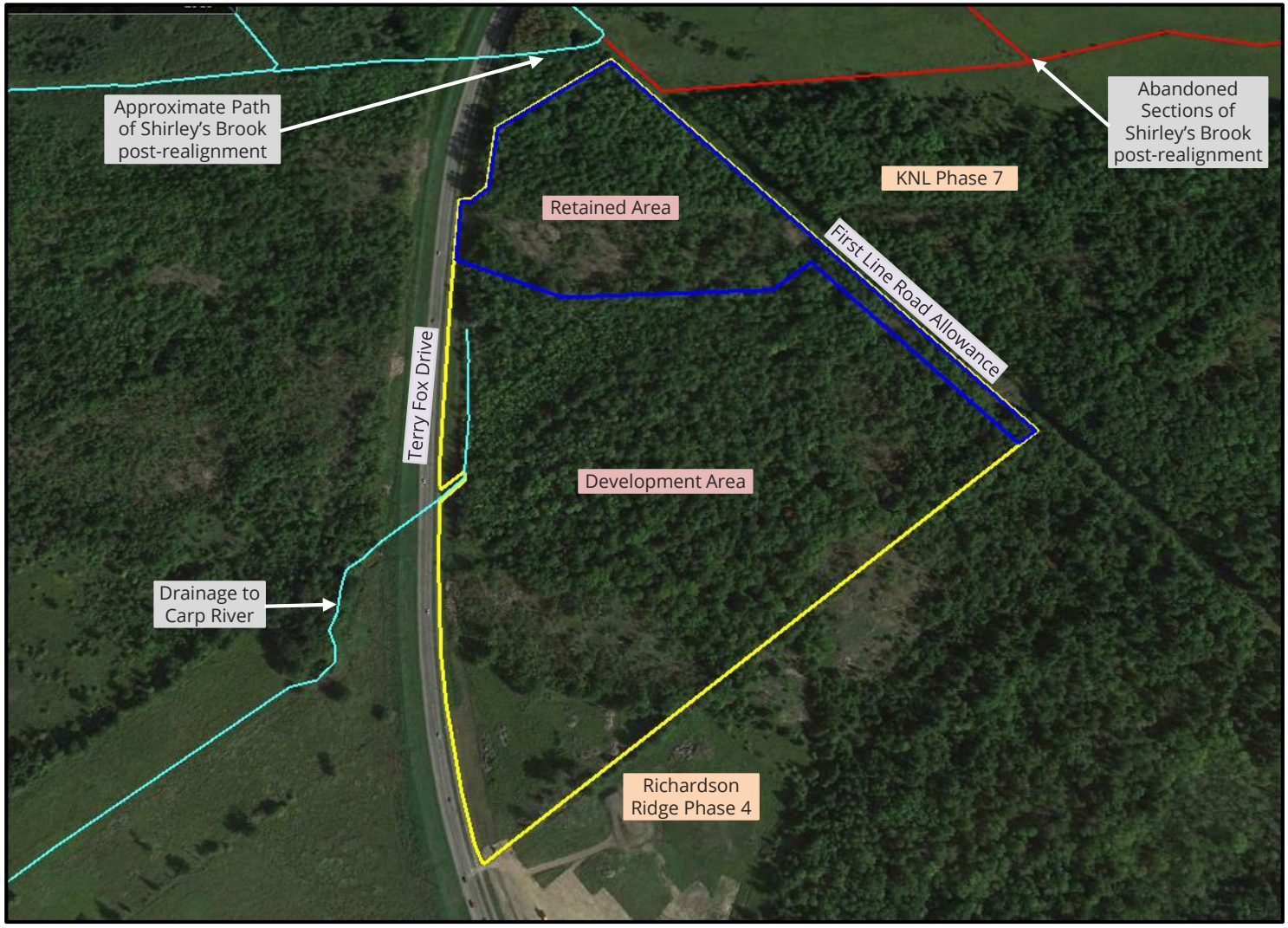
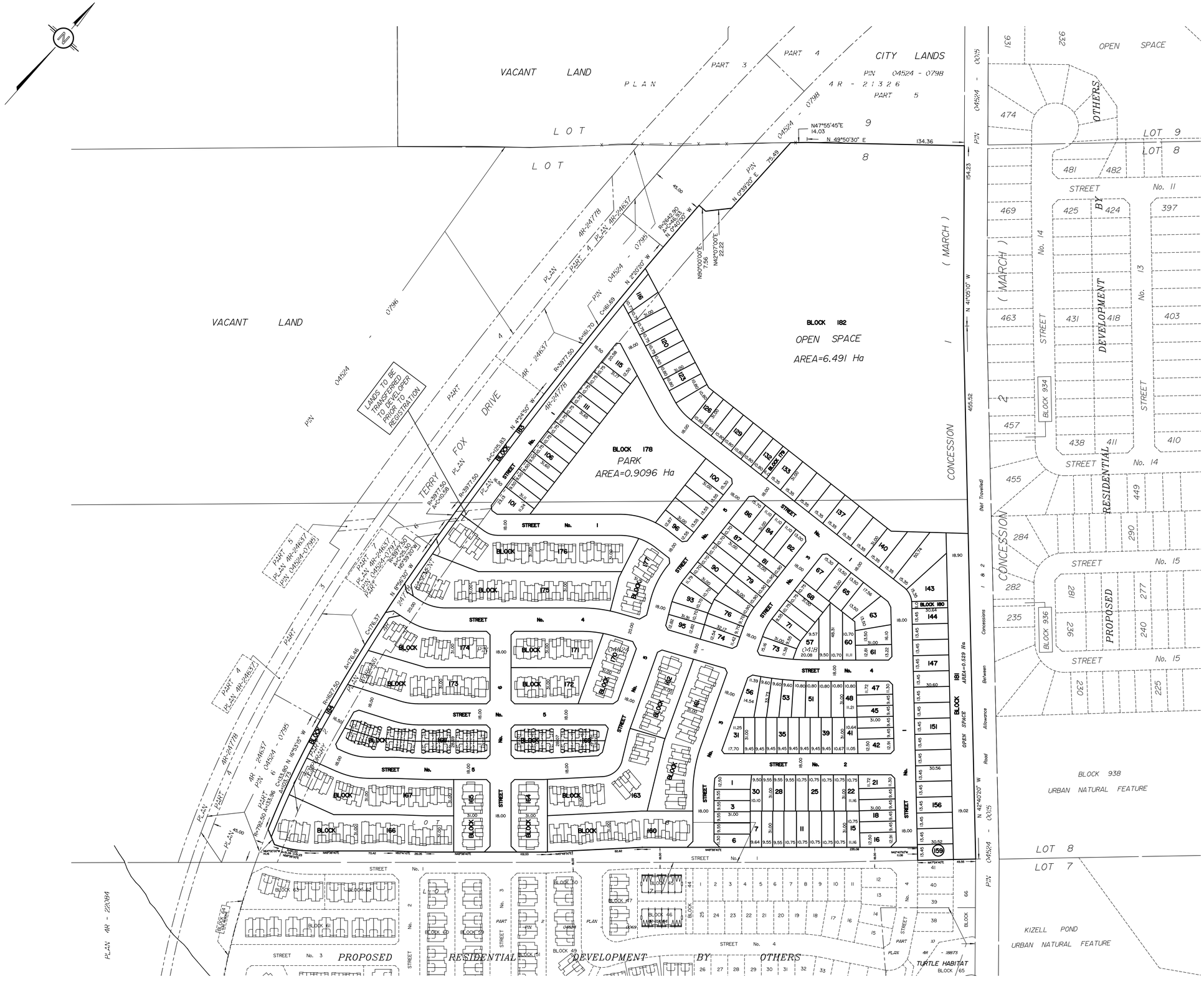
FIGURE 1: SITE OVERVIEW

Kanata Highlands Phase 1, Ottawa, Ontario
Detailed Environmental Impact Statement (EIS)



Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.



KEY MAP
NOT TO SCALE

Sketch to Illustrate

CONCEPT PLAN being PART OF LOT 8 CONCESSION 1

Geographic Township of March

CITY OF OTTAWA

Prepared by Annis , O'Sullivan , Vollebekk Ltd.

Scale 1 : 1500

60 45 30 15 0 30 60 Metres

Metric

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

UNIT COUNT

SINGLE LOTS 31' (9.45m.) PRODUCT = 48 (30%)

SINGLE LOTS 35' (10.67m.) PRODUCT = 73 (46%)

SINGLE LOTS 44' (13.45m.) PRODUCT = 27 (17%)

SINGLE LOTS 50' (15.25m.) PRODUCT = 11 (7%)

TOTAL SINGLE LOTS = 159

TOTAL TOWNHOUSE UNITS = 224

TOTAL BACK TO BACK UNITS = 52

TOTAL NUMBER OF UNITS = 435

REVISION SCHEDULE

DATE	REVISION	
DEC. 9, 2016	GENERAL REVISIONS	S
NOV. 17, 2016	GENERAL REVISIONS	S
NOV. 2, 2016	GENERAL REVISIONS	N
OCT. 20, 2016	PLAN PREPARED	N

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Job No. 16683-16 Regional Pt Lt 8 Cl MA SK D4 | S

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2.0 METHODOLOGY

The presence of natural heritage features was assessed by completing the following:

- Site surveys to describe vegetative communities;
- Site surveys to assess the potential for habitat of species at risk (SAR), wetlands, fish habitat, amphibian breeding habitat, significant wildlife habitat features, and other significant habitat features to be present;
- Examination of aerial imagery to evaluate landscape features;
- Natural Heritage Information Center (NHIC) database review;
- Obtainment of an Information and Records Request Response from the OMNRF (updated response pending);
- Review of Official Plan designations; and
- Review of background geotechnical report (Paterson 2013).

The following field surveys were conducted:

- **Plant Inventory and ELC Classification:** Refer to Appendix A for a discussion of tree inventory methods employed in the TCR. Site visits to identify plant species within the Site were conducted by Bernie Muncaster of Muncaster Environmental Planning (MEP) on May 6th, June 1st, June 26th, August 25th, and August 26th 2011 (MEP 2011). An updated site visit to inventory trees and confirm the plant inventory was conducted by Andrew McKinley of McKinley Environmental Solutions (MES) on November 16th, 2016. As discussed in Appendix A, a total of twenty-six (26) tree inventory plots were completed, spread evenly throughout the Site at a density of approximately 1 plot per hectare. Vegetative communities on Site were classified following the Ecological Land Classification (ELC) methodology (OMNRF 1998; Lee 2008), with guidance from the Ontario Wetland Evaluation System (OWES) (OMNRF 2014f). This included a three (3) season plant inventory to document the occurrence of plants, create a master plant list, and to identify and delineate plant communities according to the ELC methodology. Observations of conditions in the wetlands and channel were made during the November 16th, 2016 site visit.
- **Ecological Soil Sampling:** In order to support the ELC classification, soils were sampled to a depth of up to 120 cm using a hand-held soil auger. Soil textures, profiles, pore pattern, and moisture regime were evaluated according to the ELC methodology (OMNRF 2015). Soil sampling was completed by Andrew McKinley of MES during the November 16th, 2016 site visit.
- **Butternut Tree Survey:** Butternut Trees were noted within the Site. A follow-up Butternut Health Assessment (BHA) is scheduled for May 2017. The BHA will be completed under separate cover by a certified Butternut Health Assessor.

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- **Bird Point Count and Wildlife Encounter Surveys:** Breeding bird surveys were conducted following the OMNRF *Wildlife Monitoring Programs and Inventory Techniques - Technical Manual* (Konze & McLaren 1998) Breeding Bird Survey (BBS) method. This survey addresses multiple terrestrial bird species. Point count surveys were completed by MEP (2011) in the early morning on June 1st and June 26th, 2011. Conditions during the surveys included sunny skies and 11 ºC, clear skies and 23 ºC, and overcast skies and 18 ºC (respectively). Bird survey point locations are shown in Figure 3 (below).
- **Whip Poor Will Call Surveys:** Whip Poor Will surveys are normally conducted following the OMNRF *Draft Whip Poor Will Survey Protocol* (OMNRF 2014b). This protocol necessitates that three (3) Whip Poor Will call surveys are conducted after dusk (during certain moon phases), from mid-May until June. However, Whip Poor Will call surveys were not required for this undertaking due to the extensive night time surveying conducted by DST Consulting Engineers in 2014 adjacent to the Kanata Highlands Phase 1 Site. DST conducted fifteen (15) nights of fieldwork as part of the pilot year of a Blanding's Turtle nest protection program. This work was conducted during the Whip Poor Will calling season and included nightly walks along the First Line Road Allowance (DST 2014). Whip Poor Will call surveys are considered valid for the area up to 500 m from the survey point (OMNRF 2014b). Survey observations heard from the First Line Road Allowance would include all of the potentially suitable Whip Poor Will habitat in Kanata Highlands Phase 1, and fifteen (15) nights of surveying greatly exceeds the normal survey requirement. No Whip Poor Will calls were observed during the survey (DST 2014).
- **Blanding's Turtle:** Between 2010 and 2013, Dillon Consulting conducted intensive monitoring of the Blanding's Turtle population throughout the area south of the arc of Terry Fox Drive, including in the Kanata Highlands Phase 1 development area and the adjacent Kizell Provincially Significant Wetland (KPSW) (Dillon 2013a; 2013b). This included a large scale radio telemetry study, direct capture surveys using hoop nets, and basking surveys. The radio telemetry data gathered by Dillon provides high quality data on habitat usage throughout the development area and adjacent lands. In 2014 Bowfin Environmental Consulting (Bowfin Environmental Consulting 2014a) conducted an additional Blanding's Turtle survey to target the string of five (5) large vernal ponds that are present within the eastern part of the Richardson Ridge Phase 4 development and adjacent areas of the First Line Road Allowance. This included a basking survey undertaken following the methodology outlined in the *Blanding's Turtle Survey Protocol* (OMNRF 2013a) which includes five (5) basking survey visits during suitable weather in the early spring to early summer. Data from these surveys was utilized to map Blanding's Turtle habitat within the Kanata Highlands Phase 1 Site, as shown in Figure 4 (below).
- **Bat Roost Assessment:** In order to assess the potential presence of bat roosting habitat, a snag/cavity tree count following the methodology outlined in the *Bats and Bat Habitats:*

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Guidelines for Wind Power Projects (OMNRF 2011) was completed. The snag/cavity count is undertaken to ascertain whether the habitat is suitable for maternity roosts. This addresses several bat SAR including Little Brown Bat, Eastern Small Footed Myotis, Tricolored Bat, and Northern Long Eared Bat. In order to assess potentially suitable forest areas, a fixed area of 12.6 m radius (equating to 0.05 ha) is surveyed for the presence of snags/cavity trees equal to or greater than 25 cm diameter at breast height (DBH). If any snags or cavity trees are found, the formula πr^2 is applied to determine the number of snags/cavities per hectare. The bat snag/cavity count was conducted in conjunction with the Tree Conservation Report (TCR) tree inventory plots, so that twenty-two (22) survey points were assessed (1 per hectare of forest, excluding the Cultural Thicket, Open Rock Barrens, and Cultural Meadow). The snag/cavity counts were completed on November 16th, 2016.

- **Creek/Fish Habitat:** The small channel located in the western part of the Site near Terry Fox Drive was visually assessed on November 16th, 2016. A follow-up Headwater Drainage Assessment (TRCA 2014) will be completed in early 2017 to provide additional information on this feature.

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3.0 EXISTING CONDITIONS

3.1 Geological Conditions

The Site is rugged with elevated bedrock outcrops and rock knolls present in several areas. The northwest and southwest portions of the Site at Terry Fox Drive are located at approximately 100 to 105 m ASL. Bedrock outcrops in the southern part of the Site rise steeply to an elevation of approximately 110 m ASL, whereas the bedrock outcrops in the northern part of the Site reach an elevation of approximately 115 m ASL. Relatively flat conditions exist in forested areas around these bedrock outcrops, but generally the terrain is rugged and uneven. The Site as a whole slopes towards the southwest, draining towards Terry Fox Drive and the Carp River. A low lying swamp area exists at the northern edge of the Site adjacent to Shirley's Brook (discussed in Section 3.3). A small low-lying area also exists around the culvert at Terry Fox Drive, where the Fresh to Moist Green Ash Lowland Deciduous Forest is found (see below). The majority of the remainder of the Site can be considered to be well drained and fairly dry. Several small low-lying ephemeral pools also exist within the forested area of the Site. These pools likely represent isolated depressions within the underlying bedrock that fill with surface water. All of these small ephemeral forest pools except one were found to be dry during the November 16th, 2016 site visit (discussed in greater detail in Section 3.3).

The soil profile throughout the Site consists of topsoil (loamy material) overlaying silty clay deposits, on top of bedrock. Bedrock depth varies between 0.8 to 5.5 m below the existing ground surface. Groundwater depth was found to vary between 4 to 5 m below ground surface (Paterson Group 2013).

In order to support the ELC classification, soils were sampled by Andrew McKinley of MES to a depth of up to 120 cm using a hand-held soil auger. Soil textures, profiles, pore pattern, and moisture regime were evaluated according to the ELC methodology (OMNRF 2015). Per the ELC methodology, soil sampling results are sub-divided according to vegetative community. Vegetative community plant composition is described below in Section 3.2. As noted below, the Site is dominated by Loam, Clay Loam, and Clay soils in most areas. Although Paterson Group (2013) note that bedrock occurs at a depth of 0.8 to 5.5 m throughout the Site, rock material (either coarse fragments or bedrock) was encountered during handheld augering at shallow depths in several areas, which blocked sampling. The following soil conditions were observed:

- **Cultural Meadow:** Coarse fragments and/or bedrock prevented sampling beyond a depth of 15 cm. The ELC problematic site protocol was applied (OMNRF 2015). The effective texture was found to be a Clay Loam with a Moisture Regime of 0 (Dry).

- **Cultural Thicket:** The sample was advanced to a depth of 120 cm. The effective texture was found to be Clay Loam with mottles at 39 cm. The Moisture Regime was 5 (Moist).
- **Deciduous Hedgerow:** No soil sample was taken in the Deciduous Hedgerow, due to the small size of the community. Soil conditions can be assumed to be similar to the adjacent Cultural Meadow (Clay Loam, Dry).
- **Dry to Fresh Sugar Maple – Ironwood Deciduous Forest (FODM5-4):** Due to the large size of this ELC community (which accounts for the majority of the Site), three (3) samples were advanced in the southwest, southeast, and northeast part of the forest. Coarse fragments and/or bedrock prevented sampling to 120 cm at each location, and so the ELC problematic site protocol was applied (OMNRF 2015). The southwest sample was advanced down to a depth of 66 cm and the effective texture was found to be Loam with a Moisture Regime of 2 (Fresh). The southeast sample was advanced to a depth of 74 cm and the effective texture was Clay Loam with mottles found at 38 cm. The southeast sample had a Moisture Regime of 3 (Very Fresh). The northeast sample was advanced to a depth of 45 cm, with mottles found at 45 cm. The effective texture was Loam with a Moisture Regime of 1 (Fresh). The effective texture throughout the forest was therefore a mixture of Loam and Clay Loam, with a Moisture Regime that varied between 1 and 3 (Fresh to Very Fresh).
- **Fresh to Moist Green Ash Lowland Deciduous Forest Type (FODM7-2):** The sample was advanced to a depth of 120 cm. The effective texture was a Silty Clay Loam with mottles at 46 cm. The Moisture Regime was 4 (Moist) indicating that this area is terrestrial (a Moisture Regime of 6 is the threshold to consider the area a wetland).
- **Open Rock Barren:** No soil samples were taken in the Open Rock Barrens. These areas consist of exposed bedrock with very shallow soils present only in isolated pockets.
- **Black Ash Mineral Deciduous Swamp (SWDM2-1)**: The sample was advanced to a depth of 120 cm and gley was encountered at 28 cm. The effective texture was Clay, with a Moisture Regime of 6 (Very Moist), indicating this community qualifies as a wetland.

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Photograph 1: Soil profile in Cultural Thicket – Clay Loam shown (November 16th, 2016).

Photograph 2: Incomplete soil profile in Dry to Fresh Sugar Maple – Ironwood Deciduous Forest. Loam material shown (November 16th, 2016).

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Photograph 3: Soil profile in Fresh to Moist Green Ash Lowland Deciduous Forest. Silty Clay Loam material shown (November 16th, 2016).

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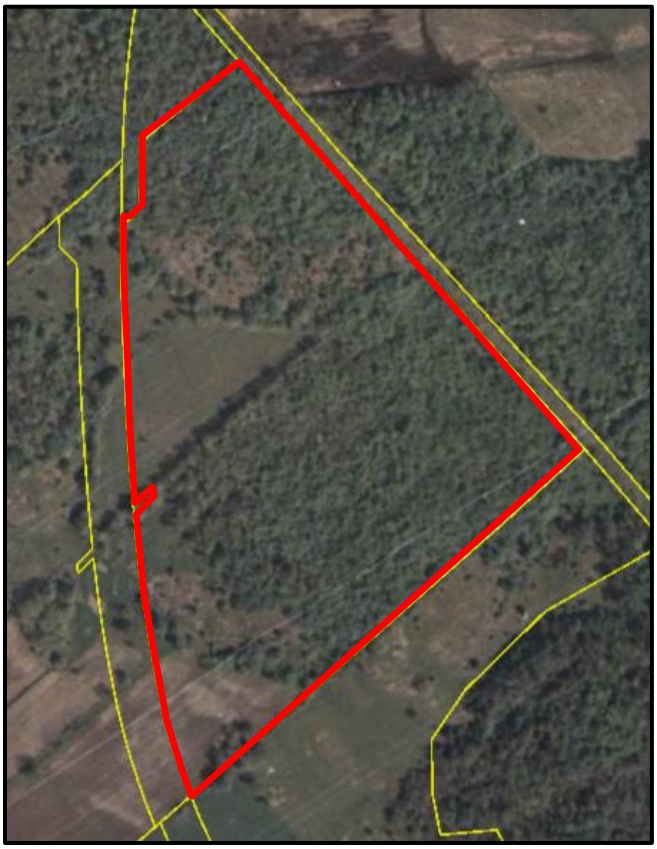
3.2 Terrestrial Vegetative Communities

The City of Ottawa Natural Heritage System Overlay (Schedule L3) identifies the forested portion of the Site as part of the Natural Heritage System (City of Ottawa 2014). As shown in Figure 2, the majority of the Site is occupied by a mature secondary growth deciduous forest. The 1976 aerial photograph, which is the oldest available for the Site, shows that the configuration of the forested area has remained relatively unchanged for at least 40 years (Photograph 4, below). Portions of the western part of the Site adjacent to Terry Fox Drive were farmed in 1976 and have since been abandoned. These former agricultural areas are presently occupied by recently disturbed Cultural Thicket/Cultural Meadow, as shown in Figure 2.



Photograph 4: Historic Air Photo from 1976. Property boundary shown in red. Note majority of the Site was forested in 1976 with agricultural activity in the western part of the Site (adjacent to the current location of Terry Fox Drive). The extent of the Site that is forested has remained relatively unchanged since at least 1976 (Photo from City of Ottawa 2016).

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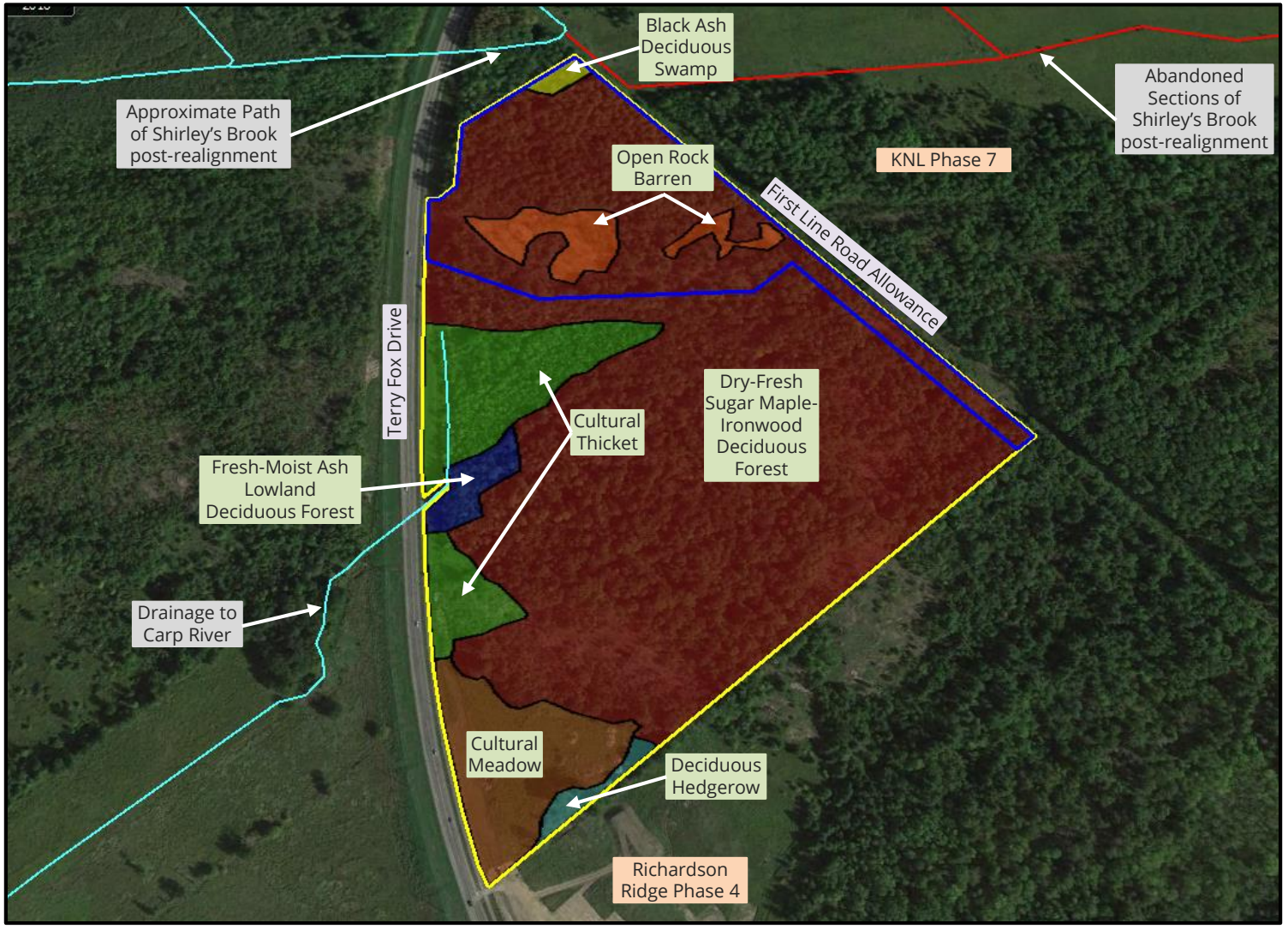
FIGURE 2: VEGETATION COMMUNITIES

Kanata Highlands Phase 1, Ottawa, Ontario
Detailed Environmental Impact Statement (EIS)



Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

ELC communities found within the Site included the following:

- Cultural Meadow
- Cultural Thicket
- Deciduous Hedgerow
- Dry to Fresh Sugar Maple – Ironwood Deciduous Forest (FODM5-4)
- Fresh to Moist Green Ash Lowland Deciduous Forest (FODM7-2)
- Open Rock Barren
- Black Ash Mineral Deciduous Swamp (SWDM2-1)

Additional information on vegetative communities, including a tree size inventory, a discussion of the site history, and a Significant Woodlot Assessment is included in the TCR (Appendix A). As noted in the TCR, the proposed extent of tree retention is anticipated to preserve the significant features and functions of the woodlot (Refer to Appendix A). Refer to Appendix B for the Master Plant List. For additional detail on the wetland ELC community within the Site (the Black Ash Mineral Deciduous Swamp), refer to Section 3.3.

Terrestrial ELC communities found within the Site are discussed in the headings below.

Cultural Meadow

A Cultural Meadow is present in the southwest corner of the Site. This area was farmed in 1976 and has since been abandoned. Within the Cultural Meadow, Canada Goldenrod and Common Ragweed were dominant. Wild Carrot, Red Clover, Philadelphia Fleabane, Timothy, Barnyard Grass, Green Foxtail, Curled Dock, Common Plantain, Black Medic, Blue Vervain, Common Burdock, Bull Thistle Common Dandelion, Horseweed, Common Mullein, Bird's Foot-Trefoil, and Common Mugwort were also present. Several piles of mulch from historic tree clearing are present in the Cultural Meadow. This mulch results from tree clearing that occurred historically prior to the current ownership, and is not due to any recent vegetation removal activities. Shrub and tree cover is very sparse in the Cultural Meadow.

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Photograph 5: Cultural Meadow in southwest corner of Site, looking east (November 16th, 2016).

Photograph 6: Cultural Meadow in southwest corner of Site, looking north, Terry Fox Drive on left (November 16th, 2016).

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Photograph 7: Cultural Meadow in southwest corner of Site, looking east. Photograph from MEP (2011) (August 25th, 2011).

Cultural Thicket

Two (2) areas of Cultural Thicket are present in the western part of the Site, near Terry Fox Drive. These areas were farmed in 1976 and have since been left to regenerate. Within the Cultural Thicket, shrub cover is dominant including Glossy Buckthorn, Hawthorn, Common Buckthorn, and Common Lilac. Regenerating American Elm (59%), White Ash (18%), and Bur Oak (12%) are the most common trees, with the diameter at breast height (dbh) of these species ranging between approximately 15 and 30 cm. White Pine up to 45 cm dbh are present in the northern part of the Cultural Thicket, as are isolated Sugar Maple. Shrub and groundcover includes Chokecherry, Common Apple, Blackberry, Narrow Leaved Meadowsweet, Canada Goldenrod, Grey Goldenrod, Narrow-Leaved Goldenrod, mosses, Purslane, Tall Buttercup, Sensitive Fern, June Meadow Grass, Barnyard Grass, Yellow Stonecrop, Common Milkweed, Canada Thistle, St. John's Wort, Black Swallowwort, Common Ragweed, Common Mullein, Silvery Cinquefoil, Canada Anemone, Calico Aster, Elecampane, Wild Parsnip, Bull Thistle, Red Clover, Common Dandelion, and Common Burdock.

Photograph 8: Cultural Thicket in western part of Site (November 16th, 2016).

Photograph 9: Cultural Thicket in western part of Site (November 16th, 2016).

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Photograph 10: Cultural Thicket in northwestern part of Site. Photograph from MEP (2011) (August 25th, 2011).

Deciduous Hedgerow

A Deciduous Hedgerow is present along the southern Site boundary. This hedgerow is aligned in a west-east direction and includes American Elm (57%), Sugar Maple (14%), Red Oak (14%), and American Basswood (14%). A few isolated mature trees are present, including several large Bur Oak growing on a rock knoll, which are up to 60 cm dbh in size. However, the majority of trees in the Deciduous Hedgerow are relatively small, ranging in size from approximately 15 to 30 cm dbh.

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Photograph 11: Deciduous hedgerow with large Bur Oak in center, looking west at Terry Fox Drive. Note exposed bedrock (November 16th, 2016).

Dry to Fresh Sugar Maple – Ironwood Deciduous Forest (FODM5-4)

The majority of the Site is occupied by a Dry to Fresh Sugar Maple – Ironwood Deciduous Forest. As noted above, the forest is secondary growth but is mature, and has been in place in its current configuration since at least 1976. Ironwood (26%) and Sugar Maple (26%) are co-dominant. American Beech (7%), Red Oak (7%), and Green Ash (7%) are all highly represented. White Ash, Yellow Birch, American Basswood, Bur Oak, White Birch, Balsam Fir, Black Cherry, and White Elm are present, although each of these species accounts for <5% of stems. Most Ironwood stems are relatively small, varying between approximately 10 and 15 cm dbh. Sugar Maple are the main canopy forming tree, varying in size between approximately 10 cm and 45 cm dbh, while isolated older specimens up to 70 cm dbh are also present. American Beech shows a similar size distribution, with the forest dominated by trees of a moderate age with a few larger specimens present. Large Red Oak up to 85 cm dbh are present in some areas, although the average tree size is approximately 25 to 50 cm dbh. Green Ash, White Ash, Yellow Birch, and American Basswood show a similar size distribution, with most stems approximately 10 to 25 cm dbh, and isolated older individuals up to 40 cm dbh present for each species. White Ash trees throughout the forest showed signs of extensive damage by the invasive Emerald Ash Borer.

Shrub cover is generally sparse within the forest and includes Black Currant, Red Raspberry, Hawthorn, Red Osier Dogwood and Common Buckthorn. Ground cover within the forest was diverse

and included Bloodroot, Trout Lily, Carolina Spring Beauty, Blue Cohosh (dominant in some areas), Dutchman's Breeches, Woodland Strawberry, Round-Lobed Hepatica, Sharp Lobed Hepatica, White Trillium, Jack-in-the Pulpit, Canada Mayflower, Barren Strawberry, Pink Lady's Slipper, Miterwort, Foamflower, Wild Ginger, Wild Leek, Evergreen Woodfern, Maidenhair Fern, Blue Phlox, Small Flowered Crowfoot, Blue Violet, and Large-leaved Aster. Disturbed areas and forest edges near openings had different groundcover composition including Thicket Creeper, Goat's Beard, Common Strawberry, Yellow Avens, Common Dandelion, Field Pussytoes, White Bedstraw, Herb Robert, Tall Buttercup, Helleborine, White Avens, Cow Vetch, Common Milkweed, Poison Ivy, and St. John's Wort. Shrub cover around forest edges and openings included Wild Red Raspberry, Common Buckthorn, Staghorn Sumac and Common Lilac.

Photograph 12: Dry-Fresh Sugar Maple - Ironwood Deciduous Forest (November 16th, 2016).

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Photograph 13: Dry-Fresh Sugar Maple - Ironwood Deciduous Forest (November 16th, 2016).

Photograph 14: Dry-Fresh Sugar Maple – Ironwood Deciduous Forest (November 16th, 2016).

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Photograph 15: Example of White Ash tree badly damaged by Emerald Ash Borer (November 16th, 2016).

Photograph 16: Dry-Fresh Sugar Maple – Ironwood Deciduous Forest. Photograph from MEP (2011) (June 1st, 2011).

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Photograph 17: Dry-Fresh Sugar Maple – Ironwood Deciduous Forest. Large mature American Beech shown at right. Photograph from MEP (2011) (June 1st, 2011).

Fresh to Moist Green Ash Lowland Deciduous Forest Type (FODM7-2)

In the vicinity of the culvert at Terry Fox Drive, there is a low lying area occupied by a Fresh to Moist Green Ash Lowland Deciduous Forest. This forest is dominated by Green Ash (55%), with American Basswood (24%) and American Elm (17%) highly represented. Sugar Maple, White Birch, and Yellow Birch are also present. The majority of trees in this area are relatively young, ranging in size from 10 cm to 25 cm dbh. Shrub cover is sparse and includes Glossy Buckthorn, Black Currant, and Wild Red Raspberry. Ground flora included Calico Aster, Helleborine, Poison Ivy, Hog-Peanut, Common Strawberry, White Bedstraw, Enchanter's Nightshade, and Sensitive Fern.

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Photograph 18: Fresh to Moist Green Ash Lowland Deciduous Forest (November 16th, 2016).

Photograph 19: Fresh to Moist Green Ash Lowland Deciduous Forest. Photograph from MEP (2011) (August 25th, 2011).

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Open Rock Barren

Large bedrock outcrops are present within the forested area of the Site, creating several Open Rock Barrens. These areas include exposed bedrock with either no soil or very shallow soils overlying bedrock. Tree cover at the edges of the Open Rock Barrens and in depressions with deeper soil is dominated by Red and Bur Oak, with some larger specimens of both species present. Ironwood, Sugar Maple, and Ash saplings are also common. Most of the exposed bedrock lacks tree cover, and is dominated by mosses, lichens, and disturbed vegetation that grows well in shallow soils including Common Mullein, Common Strawberry, Yellow Hawkweed, Wild Columbine, St. John's Wort, White Avens, Helleborine, Cow Vetch, Common Milkweed, Poison Ivy, and Ox-eye Daisy. Shrub cover around the edges of the rock knolls included Staghorn Sumac, Common Buckthorn, and Common Lilac.

Photograph 20: Open Rock Barren showing sparse tree cover (November 16th, 2016).

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Photograph 21: Open Rock Barren showing sparse tree cover (November 16th, 2016).

Photograph 22: Open Rock Barren showing sparse tree cover. Photograph from MEP (2011) (June 1st, 2011).

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Photograph 23: Open Rock Barren showing sparse tree cover. Photograph from MEP (2011) (August 25th, 2011).

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3.3 Wetlands and Watercourses

Figure 2 shows the vegetative community mapping. Wetland and watercourse communities found within the Site include the following:

- Black Ash Mineral Deciduous Swamp (SWDM2-1);
- Shirley's Brook and Terry Fox Drive Channel; and
- Woodland Ephemeral Pools

Additional information on vegetative communities including a tree size inventory, a discussion of site history, and a Significant Woodlot Assessment is included in the TCR (Appendix A). Each of these communities is discussed in the headings below.

Black Ash Mineral Deciduous Swamp (SWDM2-1)

A low lying area exists at the very northern edge of the Site adjacent to Shirley's Brook. This area is occupied by a Black Ash Mineral Deciduous Swamp that is dominated by Black Ash (69%), Red Maple (31%) and isolated Silver Maple. The Black Ash trees vary in size between approximately 10 to 20 cm dbh, whereas the Red Maple are larger, ranging between approximately 10 to 60 cm dbh. Groundcover includes Foamflower and Sensitive Fern. This wetland area is entirely within the designated open space block, and is well away from the portion of the Site that will be developed. Under normal circumstances, a 30 m vegetated setback from the wetland edge would be considered sufficient to protect the ecological functions of the wetland. Because the wetland is located at the northern edge of the retained open space block, the distance between the swamp and the development edge is approximately 250 m at the closest point, and hence the wetland is unlikely to be negatively impacted by the proposed development.

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Photograph 24: Black Ash Mineral Deciduous Swamp (November 16th, 2016).

Photograph 25: Black Ash Mineral Deciduous Swamp. Photograph from MEP (2011) (June 1st, 2011).

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Shirley's Brook and Terry Fox Drive Channel

A portion of Shirley's Brook flows through the City of Ottawa parcel located immediately north of the Site. It should be noted that the portion of Shirley's Brook which flows through KNL Phase 7 is scheduled to be realigned in 2017 and 2018, as shown in Figure 2. As discussed below in Section 3.6, this is significant as the realignment will reduce the amount of Blanding's Turtle Category 3 habitat that overlaps the Kanata Highlands Phase 1 Site. Under normal circumstances, a 30 m vegetated setback from the watercourse edge would be considered sufficient to protect the ecological functions of Shirley's Brook. Because Shirley's Brook is located beyond the northern edge of the retained open space block, the distance between the watercourse and proposed development is more than 300 m. Therefore, the proposed development is not expected to negatively affect Shirley's Brook.

A channel is present in the western part of the Site, flowing through a culvert under Terry Fox Drive to the Carp River (Figure 1). This channel appears to be an artificial feature which was likely excavated during the construction of Terry Fox Drive to convey surface flow towards the culvert. The channel has no upstream connection and appears to receive only surface runoff from the surrounding area. It appears likely that the construction and operation of Terry Fox Drive may have redirected much of the flow that would have been previously associated with this feature.

The portion of the channel that exists east of Terry Fox Drive (the upstream portion) is within the Kanata Highlands Phase 1 Site. The downstream portion exists west of Terry Fox Drive, flowing towards the Carp River. Niblett Environmental (2015) studied the downstream portion of the channel, and concluded that the feature has intermittent flow, that it provides indirect fish habitat (with no direct fish usage observed), that the channel is dominated by terrestrial vegetation, and that there is little riparian cover in the downstream section.

During the November 16th, 2016 Site visit, MES observed the upstream portion of this feature (east of Terry Fox Drive, within the Kanata Highlands Phase 1 Site). The upstream portion of the channel was nearly completely dry throughout and was not flowing. Isolated pools of up to 5 cm of water were observed, but overall the channel was dry. The lack of wetland vegetation within the channel suggests that it is likely dry most of the year. The upstream portion of the channel has an artificial rocky bottom leading up the Terry Fox Drive culvert, and is otherwise overgrown with terrestrial vegetation. The upstream portion of the channel is likely only wet in the early spring, when it may provide ephemeral amphibian and indirect fish habitat. There was insufficient water for fish to be present during the November 16th, 2016 Site visit, although a single Northern Leopard Frog was observed. Taken together, the downstream observations of the feature completed by Niblett Environmental (2015) and the upstream observations completed by MES, suggest that the channel is a low quality intermittent drainage feature with no direct fish habitat and very limited hydro-period.

It is therefore not considered a significant aquatic habitat feature. These observations will be confirmed through a follow-up Headwater Drainage Assessment (TRCA 2014), which is scheduled to be completed in early 2017.

A stormwater easement exists in the western part of the Site, encompassing a portion of the channel and the culvert under Terry Fox Drive. This stormwater easement and culvert were established as a temporary measure during the construction of Terry Fox Drive, and were to be retained only until development of the area east of Terry Fox Drive was complete. Following subdivision development, the culvert will no longer be required for either wildlife movement or for conveyance of surface drainage. As such, the stormwater easement and the associated channel are scheduled to be transferred for development prior to registration.

Photograph 26: Culvert at Terry Fox Drive, looking west (November 16th, 2016).

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Photograph 27: Upstream portion of channel in western part of Site, looking north from Terry Fox Drive culvert (November 16th, 2016).

Photograph 28: Upstream portion of channel in western part of Site, looking north further upstream from Terry Fox Drive culvert (November 16th, 2016).

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Woodland Ephemeral Pools

There are several shallow woodland ephemeral pools present within the forested area of the Site. These features appear to result from surface water pooling in bedrock depressions and/or low lying areas of impermeable clay soil. Vegetation found within the pools includes Marsh Fern, Ostrich Fern, Sensitive Fern, Common Cattail, Northern Blue Flag, Wool Grass, and various sedges. Each of the pools observed within the Site are shallow depressions that lack permanent water. Pools were observed by MEP (2011) in May and June to have between 5 and 20 cm of standing water. During the November 16th, 2016 Site visit, all of the pools found within the Site were observed to be dry, with the exception of a single 4 m wide pool along the First Line Road Allowance which retained approximately 20 cm of standing water. This pool was within the 19 m wide proposed open space block along the western side of the First Line Road Allowance. These observations suggest that the woodland pools are mostly ephemeral features which may be inundated with surface water during the spring melt or during periods of heavy precipitation, but which dry up later in the season. Due to their isolation from adjacent waterbodies, none of the pools are likely to provide fish habitat. During the site visits conducted for bird and plant surveys, comparatively few amphibians were observed within the Site, and the majority of the Site can be considered upland habitat. While relatively few amphibians were observed within the Site, it is possible that some of the ephemeral pools could potentially provide early season amphibian breeding habitat. All of the pools found within the Site appear to be too shallow, too heavily shaded, and too small to be likely to function as Category 1 or 2 habitat for Blanding's Turtle (Edge 2010; OMNRF 2014d). As discussed below in Section 3.6, the radio-telemetry study conducted by Dillon Consulting (2013a; 2013b; 2013c) did not show any evidence of Blanding's Turtle utilizing the ephemeral pools within the Kanata Highlands Phase 1 Site. It is therefore assumed that the only habitat function provided by the ephemeral pools for Blanding's Turtle may be to theoretically provide shelter during turtle movement through the Site, if turtles were to pass through the area. This habitat function would fall within the definition of Category 3 habitat (OMNRF 2014d). As discussed below in Section 4.2, the majority of pools found within the Site would be preserved within the designated open space blocks, particularly along the edge of the First Line Road Allowance.

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Photograph 29: An ephemeral pool showing dry conditions during the November 16th, 2016 site visit (November 16th, 2016).

Photograph 30: An ephemeral pool showing dry conditions during the November 16th, 2016 site visit (November 16th, 2016).

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Photograph 31: The only ephemeral pool showing wet conditions (20 cm of water) during the November 16th, 2016 site visit. This pool is located within the open space block along the First Line Road Allowance (November 16th, 2016).

Photograph 32: Ephemeral pool showing shallow standing water during the May 6th, 2011 site visit. Photograph from MEP (2011).

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Photograph 33: Ephemeral pool showing shallow standing water during the May 6th, 2011 site visit. Photograph from MEP (2011).

Photograph 34: Ephemeral pool showing shallow standing water and wetland vegetation during the June 26th, 2011 site visit. Photograph from MEP (2011).

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3.4 Adjacent Lands and Significant Features

There are several designated natural habitats in the vicinity of the Site. As noted above in Section 3.3, there is a small Deciduous Swamp at the northern edge of the open space block within the Site, beyond which is a parcel of City of Ottawa land and Shirley's Brook. These features are located well within the proposed open space block, and are more than 250 m from the proposed development edge. It should be noted that the small wetland patch along Shirley's Brook (in the City parcel north of the Site) was previously shown as part of the South March Highlands Provincially Significant Wetland (SMHPSW). However, in recent OMNRF mapping, the construction of Terry Fox Drive is shown to have separated this area from the larger wetland complex located northwest of the road, and so the wetland area in the City parcel immediately north of the open space block may no longer be considered part of the SMHPSW. Regardless, this wetland patch and Shirley's Brook are located north of the proposed open space block more than 250 m from the proposed development edge. Therefore, no significant negative impacts on the wetland and Shirley's Brook are anticipated. Several retained open space blocks will be present in the Richardson Ridge Phase 4 and KNL Phase 7 developments adjacent to the Site. The retained open space areas in the KNL Phase 7 lands are separated from the Site by the cleared corridor of the First Line Road Allowance, which is 20 to 30 m wide. Because there is already an existing cleared corridor separating KNL Phase 7 and the Kanata Highlands Phase 1 Site, development work within the Site is unlikely to negatively impact adjacent retained areas in KNL. In order to provide a wildlife movement corridor, the 19 m wide block of open space (0.5 ha) that will be retained along the First Line Road Allowance will connect to an adjacent block of open space within the Richardson Ridge Phase 4 lands (to the south). Connectivity between these areas is discussed below in Section 3.7. Construction stage mitigation measures to protect the adjacent open space blocks in Richardson Ridge Phase 4 are discussed below in Sections 4.1 and 4.3. The currently proposed extent of open space retention is sufficient to protect the adjacent designated habitats which occur within 30 m of the Site (e.g. the Deciduous Swamp and Shirley's Brook north of the Site).

The Kizell Provincially Significant Wetland (KPSW) is located south and southeast of the Site, however, the entirety of the Site is beyond the 120 m regulated area around the wetland. The SMHPSW and the associated South March Highlands Candidate Life Science Area of Scientific and Natural Interest (ANSI) are located northwest of the Site. However, the SMHPSW and the associated ANSI are entirely separated from the Site by Terry Fox Drive, and there is no direct connectivity to these areas as a result of the road. Therefore, the Kanata Highlands Phase 1 Site is sufficiently separated from the KPSW and SMHPSW so that the development is unlikely to directly impact either designated area.

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3.5 Wildlife and Significant Wildlife Habitat

Wildlife and bird species noted during surveying are listed in Appendix C. Bird survey points and the estimated extent of interior forest habitat are shown below in Figure 3. During the Breeding Bird Surveys, forty (40) species of birds were noted at the Site. The majority of these are relatively common bird species that are often found in suburban areas of Ottawa. Several species that prefer interior forest habitat were noted (e.g. Ovenbird, Veery and Wood Thrush), although it should be noted that the bird surveys were undertaken in 2011 prior to the completion of Terry Fox Drive. Since that time, the completion of the road has created a new forest edge along the western side of the Site, which has significantly reduced the extent of interior forest habitat.

Forested areas 100 m from an opening that is 20 m or greater in size are considered interior forest habitat. Existing openings within the southwest part of the Site, as well as anticipated tree clearing within Richardson Ridge Phase 4 (scheduled for 2017), impact the extent of interior forest habitat. The presence of Terry Fox Drive along the western Site boundary, and the First Line Road Allowance (which is maintained as a 20 to 30 m wide cleared corridor) along the eastern Site boundary further reduce the extent of interior forest habitat. With these factors taken into account, the extent of interior forest habitat will be approximately 7.9 ha, following completion of adjacent tree clearing in 2017. As noted in the attached TCR (Appendix A), this is below the 8 ha threshold required for the woodlot to qualify as a Significant Woodlot under the assessment criteria (OMNRF 2005). As shown in Figure 3, approximately 0.4 ha of the existing interior forest habitat will be preserved following development.

Other wildlife encountered during the site visits included American Toad, Northern Leopard Frog, Wood Frog, Common Gartersnake, Common Porcupine, Groundhog, White Tailed Deer, Common Raccoon, Red Squirrel, Eastern Grey Squirrel, and Eastern Chipmunk. All of these are relatively common species frequently found in remnant woodlots in suburban areas.

As discussed in Section 3.3 (above), Shirley's Brook will not be impacted by the undertaking and the small channel in the western part of the Site is not considered a significant aquatic habitat feature. During the site visits conducted for bird and plant surveys, comparatively few amphibians were observed within the Site, and only a few individuals of the most common species found in the area were noted (American Toad, Northern Leopard Frog, Wood Frog). Due to the lack of amphibian activity and the generally upland nature of the terrestrial habitats within the Site, it is considered unlikely that the ephemeral woodland pools provide significant amphibian breeding habitat.

Eastern Wood Pewee and Wood Thrush, which are both avian species of Special Concern, were noted during the 2011 bird surveys. Blanding's Turtle Category 3 habitat also overlaps portions of

the Site. The habitat of Species at Risk (SAR) is considered Significant Wildlife Habitat (OMNRF 2014a). The presence of these species and the extent of their habitat is discussed in greater detail below in Section 3.6 (below). No other Significant Wildlife Habitat features such as stick nests, migratory bird stopover points, heron rookeries, reptile hibernacula, caves, or bedrock fissures were noted within the Site (OMNRF 2014a).

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FIGURE 3: BIRD SURVEY POINTS & INTERIOR FOREST HABITAT

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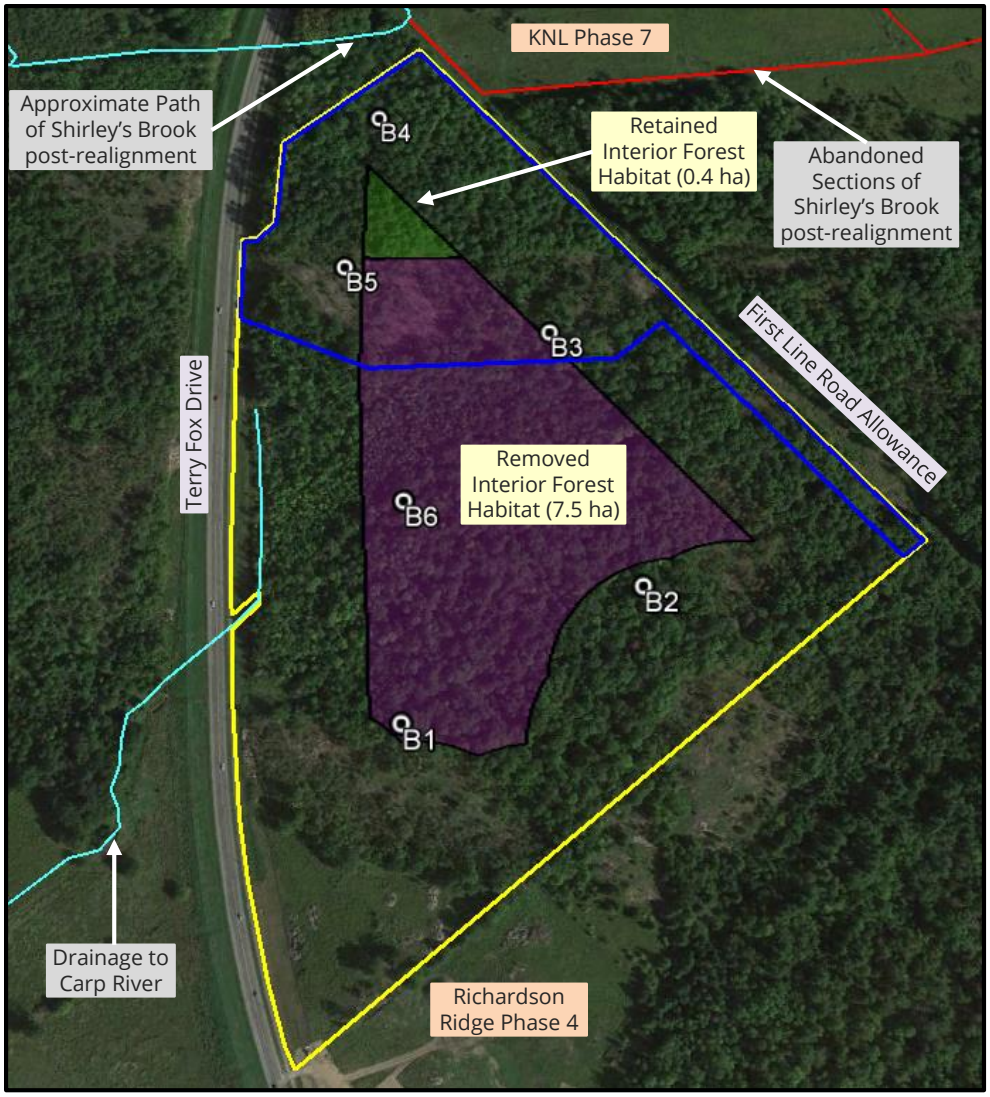
Kanata Highlands Phase 1, Ottawa, Ontario
Detailed Environmental Impact Statement (EIS)

December 2016



- Property Boundary
- Watercourses
B2 - Bird Survey Points

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

3.6 Species at Risk

The Natural History Information Center (NHIC) records for the nine (9) grids that include and surround the Site were reviewed. This included an area 3 km x 3 km in size and all published Species at Risk (SAR) records were noted. An Information and Records Request Response was received from the Ontario Ministry of Natural Resources and Forestry (OMNRF) in 2011 (Refer to Appendix D). An updated Information and Records Request was submitted to the OMNRF in November 2016, although a response had not yet been received at the time of report preparation. The updated 2016 Information and Records Request Response will be forwarded to the City upon receipt. The following SAR were noted as potentially occurring in the area:

- Barn Swallow (threatened);
- Bobolink (threatened);
- Eastern Meadowlark (threatened);
- Eastern Wood Pewee (special concern);
- Wood Thrush (special concern);
- Eastern Small-footed Myotis (endangered);
- Little Brown Bat (endangered);
- Northern Long-eared Bat (endangered);
- Tri-Colored Bat (endangered);
- Whip Poor Will (threatened);
- Butternut Trees (endangered);
- Snapping Turtle (special concern); and
- Blanding's Turtle (threatened).

The following is a summary of the potential for these species to occur within the Kanata Highlands Phase 1 area:

- **Barn Swallow:** Barn Swallows nest in human made structures such as old barns, culverts, under bridges, stables, and old sheds (SARO 2016). There are no structures present within the Site and no demolition is planned for the development. Barn Swallows were not observed foraging within the Site during the bird surveys (MEP 2011). The culvert under Terry Fox Drive is too small and too low to the ground to be used for Barn Swallow nesting, and so is not considered potential habitat for this species.
- **Bobolink and Eastern Meadowlark:** Bobolink and Eastern Meadowlark are typically associated with open areas such as grasslands, pastures, old hayfields, and graminoid dominated regenerating agricultural fields (SARO 2016). As noted in Section 3.2, the only open habitat within Kanata Highlands Phase 1 is the small Cultural Meadow in the southwest corner of the Site. This Cultural Meadow is approximately 1.4 ha in size. The generally recognized minimum area of open habitat for Bobolink and Eastern Meadowlark nesting is 5

ha (OMNRF 2013b) and generally any open area under 2 ha in size is considered too small to warrant surveying for these species. As noted in Section 3.2, the Cultural Meadow is forb dominated with significant shrub growth, whereas Bobolink and Eastern Meadowlark utilize graminoid dominated meadows with little shrub growth. The Cultural Meadow is hence too small and too forb dominated to be likely to provide habitat for these species. No Bobolink or Eastern Meadowlark were noted within the Site during the bird surveys (MEP 2011).

- **Eastern Wood Pewee and Wood Thrush:** Eastern Wood Pewee and Wood Thrush are both species of special concern, and both were noted within the forested portions of the Site during the 2011 bird surveys (MEP 2011). Both species are found in moderately aged to mature deciduous and mixed forest (SARO 2016). The majority of the forested area of the Site can be considered suitable habitat for both species. The habitat of species of special concern is not regulated under the Ontario ESA, and there are thus no permitting requirements associated with these species. As discussed below in Section 4.1, approximately 7 ha of habitat will be preserved within the proposed open space blocks, which will preserve the ability of the woodlot to provide breeding habitat for both Eastern Wood Pewee and Wood Thrush. The 7 ha retained blocks are large enough so that it is likely both species could continue to be found in the area following development. Mitigation measures to avoid impacts to the individuals of these species during construction are outlined in Section 4.4.
- **Little Brown Bat, Eastern Small Footed Myotis, Northern Long Eared Bat and Tricolored Bat:** No caves, bedrock fissures, mining shafts, abandoned buildings, or other features which may function as bat hibernacula habitat were noted within the Site. The OMNRF (2011) guidelines for bat surveying are outlined in the *Bats and Habitats: Guidelines for Wind Power Projects*. These guidelines state that deciduous and mixed forest habitats have the potential to provide maternity roosting habitat. In order for a forested area to be considered potentially suitable as maternity roosting habitat, snag and cavity trees ≥25 cm dbh must occur in a density ≥10 trees per ha. The tree size and composition of forest within the Kanata Highlands Phase 1 Site was judged to be potentially suitable for bat roosting throughout the majority of the Site. The potential presence of maternity roosting habitat is assessed through a count of snag/cavity trees ≥25 cm dbh. In order to warrant follow-up studies, snags/cavity density must be ≥10 trees per ha. Twenty-two (22) snag/cavity plots were surveyed in the woodlot during the TCR, following the same distribution as the tree survey plots (Refer to Appendix A). Bat snag/cavity counts were completed on November 16th, 2016. The total area surveyed for bat snags/cavities was equivalent to 1.1 ha (22 plots, each 0.05 ha in size). Within these plots only five (5) cavity trees were noted and no snags were found. This is equal to a density of 4.55 cavities/ha of forest. Because the density of suitable snag/cavity trees per hectare is less than the threshold of ≥10 trees per hectare, the habitat can be considered unsuitable for bat maternity roosting and follow-up studies are not required. As

described above in Section 3.2, the forest throughout the Site is generally in good condition and fairly open. There are relatively few dead trees and so comparatively few snags and/or dead/dying trees with large cavities were noted. Cavities noted within the Site included the following:

- Cavity in living Sugar Maple in TCR plot 12;
- Cavity in living White Ash in TCR plot 15;
- Cavity in living Red Oak in TCR plot 19;
- Cavity in dead American Beech in TCR plot 24 (photograph below); and
- Cavity in dead Red Maple in TCR plot 27.

All of these cavities were present within the Dry to Fresh Sugar Maple – Ironwood Deciduous Forest, except for the cavity in TCR plot 27, which was found within the Black Ash Deciduous Swamp.

Photograph 35: Dead American Beech with cavity in TCR plot 24 (November 16th, 2016).

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Photograph 36: Dead Red Maple with cavity in TCR plot 27 (November 16th, 2016).

- **Whip Poor Will:** Whip Poor Will surveys are normally conducted following the OMNRF *Draft Whip Poor Will Survey Protocol* (OMNRF 2014b). This protocol necessitates that three (3) Whip Poor Will call surveys are conducted after dusk (during certain moon phases), from mid-May until June. However, Whip Poor Will call surveys were not required for this undertaking due to the extensive night time surveying conducted by DST Consulting Engineers in 2014 adjacent to the Kanata Highlands Phase 1 Site. DST conducted fifteen (15) nights of fieldwork as part of the pilot year of a Blanding's Turtle nest protection program. This work was conducted during the Whip Poor Will calling season and included nightly walks along the First Line Road Allowance (DST 2014). Whip Poor Will call surveys are considered valid for the area up to 500 m from the survey point (OMNRF 2014b). Survey observations heard from the First Line Road Allowance would include all of the potentially suitable Whip Poor Will habitat in Kanata Highlands Phase 1, and fifteen (15) nights of surveying greatly exceeds the normal survey requirement. No Whip Poor Will calls were observed during the survey (DST 2014).
- **Butternut Trees:** Several Butternut Trees were noted within the Site during the Site visit. Although Butternut Trees are known to occur within the Site, it should be noted that relatively few Butternuts were found, and the density of Butternuts within the Site appears to be low compared to other forested areas in the region. A follow-up Butternut Health Assessment (BHA) is scheduled for May 2017. The BHA will be completed under separate cover by a certified Butternut Health Assessor. The BHA will identify the total number of Butternuts found within the Site and their health condition. Once this information is

available, it will be utilized to determine what mitigation/regulatory requirements exist for Butternut Trees, in consultation with the OMNRF. Requirements for Butternut Trees will be fulfilled in compliance with the rules and regulations of the ESA.

- **Snapping Turtle:** Snapping Turtle are a species of special concern. Snapping Turtle are associated with a variety of wetland and watercourse habitats, however, they rarely travel long distances from permanent water (SARO 2016). As noted above in Section 3.3, the channel in the western part of the Site along Terry Fox Drive is not considered a significant aquatic habitat feature. Shirley's Brook is located north of the Site and is well outside of the proposed development area. The woodland ephemeral pools described in Section 3.3 are not permanent sources of water and are unlikely to be utilized by Snapping Turtle. Therefore, there are no known suitable habitat areas for this species within the Site. While no evidence of this species was noted within the Site, construction stage mitigation measures have been included to address potential impacts to turtle species (Refer to Section 4.4).
- **Blanding's Turtle:** Blanding's Turtle are known to occur within the vicinity of the Site, however, Blanding's Turtle have not been documented within the Kanata Highlands Phase 1 property (Dillon 2013a; 2013b). Between 2010 and 2013, Dillon Consulting conducted intensive monitoring of the Blanding's Turtle population throughout the area south of the arc of Terry Fox Drive, including in the Kanata Highlands Phase 1 development area and the adjacent Kizell Provincially Significant Wetland (KPSW) (Dillon 2013a; 2013b). Blanding's Turtle were shown to utilize wetland habitats within the KPSW, the South March Highlands Provincially Significant Wetland (SMHPSW), Shirley's Brook, and a string of five (5) large vernal ponds located in the eastern part of the Richardson Ridge Phase 4 development and along the First Line Road Allowance. All of these areas have been designated by the OMNRF as Category 1 and/or Category 2 habitat for Blanding's Turtle. Category 1 habitat for Blanding's Turtle is defined as overwintering/nesting sites, whereas Category 2 habitat includes core wetlands utilized by turtles for the majority of the active season (OMNRF 2014d). Both habitat designations include a terrestrial buffer of 30 m around the wetland feature (OMNRF 2014d). Category 1 and 2 habitat areas in the vicinity of the Kanata Highlands Phase 1 Site are shown below in Figure 4. Notably, there are no areas of Category 1 or 2 habitat recognized by the OMNRF which overlap the Kanata Highlands Phase 1 Site. It is important to note that while several ephemeral pools were found within the Site (as described in Section 3.3), all of these features appear to be too shallow, too heavily shaded, and too small to be likely to function as Category 1 or 2 habitat for Blanding's Turtle (Edge 2010; OMNRF 2014d). The radio-telemetry study conducted by Dillon Consulting (2013a; 2013b; 2013c) did not show any evidence of Blanding's Turtle utilizing the ephemeral pools within the Kanata Highlands Phase 1 Site, and in fact, no Blanding's Turtles were ever found to move through the Site. Dillon Consulting's analysis included a modelling exercise which

identified key movement corridors based on radio-telemetry data. The Kanata Highlands Phase 1 Site was not identified as falling within any of the key movement corridors identified through this analysis (Dillon Consulting 2013a; 2013b; 2013c). The *General Habitat Description for Blanding's Turtle* (OMNRF 2014d) establishes Category 3 Blanding's Turtle habitat as the area up to 250 m from Category 1 and 2 habitat areas. The primary function of Category 3 habitat is to provide a corridor for Blanding's Turtle overland movement between core wetlands (OMNRF 2014d). As shown in Figure 4, portions of the Kanata Highlands Phase 1 property fall within the definition of Category 3 habitat, even though no evidence of Blanding's Turtle moving through the Site has been documented. The current development plan would result in approximately 5.3 ha of Category 3 habitat being preserved within the designated open space blocks, whereas approximately 7.8 ha of Category 3 habitat would be removed by the development. It should be noted that the Category 3 habitat mapping has been completed assuming adjacent areas of Category 2 habitat within KNL Phase 7 and Richardson Ridge Phase 4 will be removed, as outlined in their respective permit applications (MES 2016; OMNRF 2016b). The KNL Phase 7 permit was approved in November 2016 (Permit Number KV-C-002-14) and will result in the realignment of a portion of Shirley's Brook north of the Site. The Richardson Ridge Phase 4 permit is in the late stages of the approval process and will result in the removal of two (2) vernal ponds located immediately south of the Kanata Highlands Phase 1 Site. These alterations in surrounding areas impact how much Category 3 habitat is likely to be present within the Kanata Highlands Phase 1 Site during future development. Requirements for Blanding's Turtle habitat removal will be fulfilled in compliance with the rules and regulations of the ESA.

In summary, the habitat of four (4) SAR is known to overlap the Site. Wood Thrush and Eastern Wood Pewee are species of special concern and removal of their habitat does not require an authorization under the ESA. Impacts to their habitat will be mitigated through the retention of 7 ha of open space, as outlined below in Section 4.1. Removal of Butternut Trees and Blanding's Turtle habitat may require an authorization under the ESA. Requirements for Butternut and Blanding's Turtle will be determined in consultation with the OMNRF, in compliance with the rules and regulations of the ESA. Mitigation measures to protect the individuals of these species are outlined below in Section 4.4

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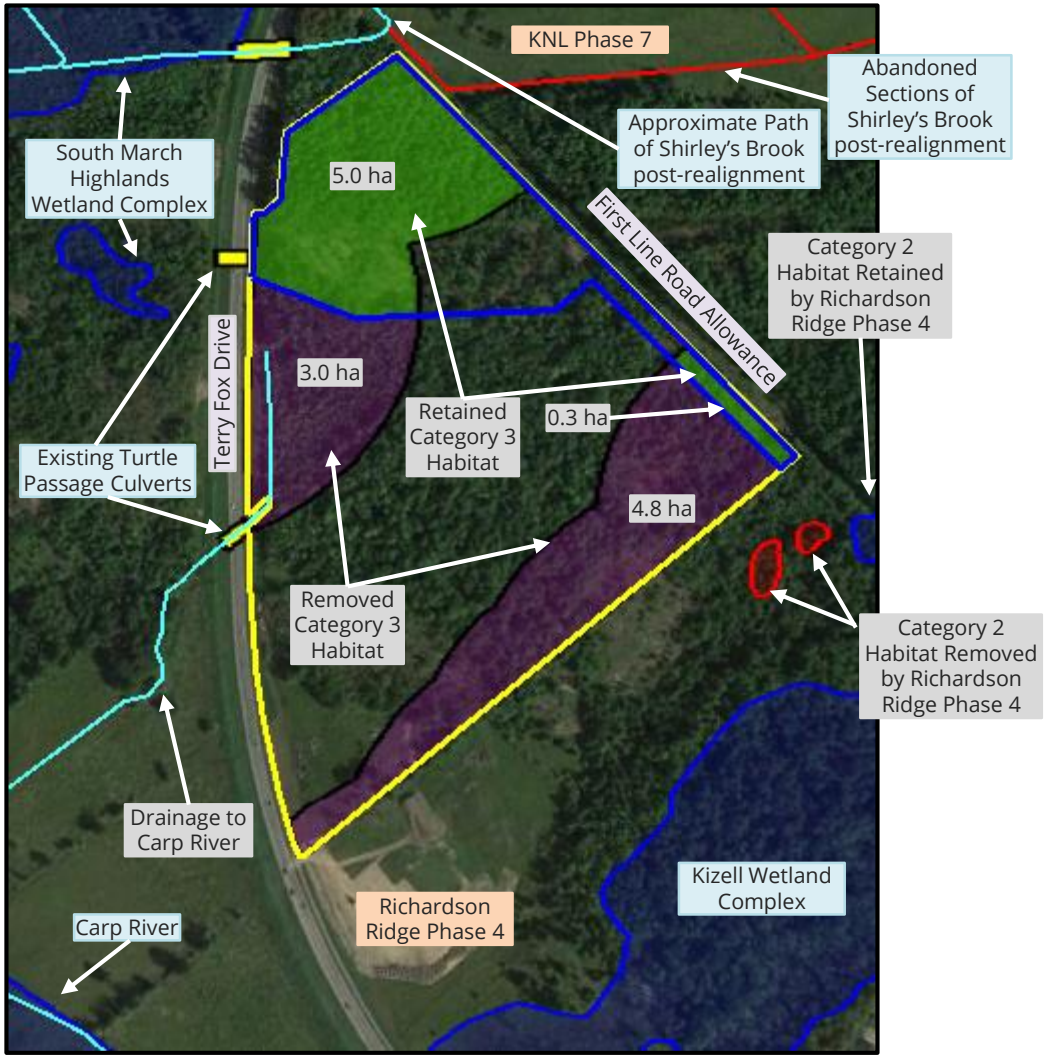
December 2016

FIGURE 4: BLANDING'S HABITAT MAPPING

Kanata Highlands Phase 1, Ottawa, Ontario
Detailed Environmental Impact Statement (EIS)



Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.
Please Note: Category 3 Blanding's Turtle Habitat Mapping has been completed based on the anticipated post-development habitat retained with KNL Phase 7 and Richardson Ridge, as permits for habitat removal in those areas are currently in process.

3.7 Linkages

As discussed above in Section 3.6, available evidence suggests that the Site is not likely to provide a core Blanding's Turtle movement corridor. The Site does not overlap either the corridor of wetland habitat between the Carp River and the KPSW, or the corridor of wetland habitat between the SMHPSW and Shirley's Brook. As such, the Site does not appear to provide a critical linkage function for wildlife movement. Following development, the primary linkage concern for the Site will be connectivity between the 6.5 ha retained open space block in the northern part of the Site, and other adjacent natural features to the east and south. This concern has been address by the arrangement of the open space blocks along the First Line Road Allowance, which are discussed in greater detail in Section 4.1 (below).

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4.0 DESCRIPTION OF ENVIRONMENTAL IMPACTS AND MITIGATION

4.1 Terrestrial Habitat and Tree Removal

Figure 1 shows the proposed arrangement of retained open space areas. This includes a large approximately 6.5 ha block of forested habitat that is to be preserved in the northern part of the Site, as well as a 19 m wide open space block along the edge of the First Line Road Allowance. The retained block along the First Line Road Allowance will be approximately 0.5 ha in size, and so the total open space dedication is approximately 7 ha. The rationale for the extent and layout of the retained open space areas is discussed in greater detail in Section 3.3 of the TCR (Appendix A). As noted in the TCR, the proposed extent of tree retention is anticipated to preserve the significant features and functions of the woodlot. The arrangement of the open space blocks will ensure that a portion of the interior forest habitat within the Site is protected, and the critical buffer areas around adjacent features (e.g. Shirley's Brook and the Deciduous Swamp in the northern part of the Site) will also be preserved. In addition, the passive recreational functions currently provided by the woodlot will continue to be provided by the 7 ha of retained open space areas, which will be transferred to the City of Ottawa following development. It is therefore anticipated that the currently proposed 7 ha of open space dedication will be sufficient to preserve the significant features and functions of the woodlot.

As discussed above in Section 1.2, the Richardson Ridge Phase 4 development is located along the southern Site boundary. The Richardson Ridge Phase 4 development is in the late stages of subdivision approval and is anticipated to commence tree clearing in 2017. The Richardson Ridge Phase 4 development includes a block of retained habitat along the First Line Road Allowance, which will connect to the 19 m wide (0.5 ha) open space block along the First Line Road Allowance within the Kanata Highlands Phase 1 Site. Together, these open space blocks will provide a wildlife movement corridor, which is designed to provide connectivity between the 6.5 ha open space block in the northern part of the Kanata Highlands Phase 1 Site, and the western extension of the KPSW (located south of Richardson Ridge Phase 4). The retained areas in Kanata Highlands Phase 1 and Richardson Ridge Phase 4 also connect to adjacent retained areas within KNL Phase 7 (e.g. the remainder of the KPSW to the east), as well as to the Carp River (west) and the South March Highlands Conservation Forest (SMHCF) (northwest) through existing wildlife passage culverts under Terry Fox Drive (Figure 4). In combination, the preserved open space areas in Kanata Highlands Phase 1, Richardson Ridge Phase 4, and KNL 7 will provide movement corridors for wildlife between the major open space blocks within each subdivision, as well as the KPSW, the Carp River, and the SMHCF.

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For mitigation measures to protect retained trees during tree removal, refer to Section 4.0 of the TCR (Appendix A). Mitigation measures to protect wildlife during tree clearing are included in Section 4.4 (below).

4.2 Wetlands and Watercourses

As noted in Section 3.3, there is a small wetland area at the northern edge of the open space block within the Site, beyond which is Shirley's Brook. These features are located well within the proposed open space block, and are more than 250 m from the proposed development edge. Therefore, no significant negative impacts on the wetland and Shirley's Brook are anticipated. As discussed in Section 3.3, the small channel located along Terry Fox Drive is not a significant aquatic habitat feature, and so transfer and development of the stormwater easement is not expected to result in a significant negative environmental impact. As noted previously, the Site is sufficiently separated from the KPSW and the SMHPSW that there are no significant negative impacts on these wetlands anticipated. Lastly, as described in Section 3.5, comparatively few amphibians were noted within the Site during the visits conducted for the plant and bird surveys. Due to the generally upland nature of the terrestrial habitats within the Site, it is considered unlikely that the ephemeral woodland pools provide significant amphibian breeding habitat. As noted in Section 3.6, available evidence suggests that these pools do not provide Category 1 or 2 Blanding's Turtle habitat. The removal of ephemeral pools within the designated development area is therefore not considered a significant negative impact. However, it is anticipated that the majority of pools found within the Site would be preserved within the designated open space blocks, particularly along the edge of the First Line Road Allowance.

4.2.1 Sediment and Erosion Controls

During construction, wetlands and conveyance systems can be exposed to significant sediment loadings. Although construction is only a temporary situation, a sediment and erosion control plan will be required to ensure the retained wetland habitats and conveyance systems are not negatively impacted by sediment and erosion.

The sediment and erosion control plan will include the following:

- Groundwater in trenches (if present) will be pumped into a filter mechanism, such as a trap made up of geotextile filters and straw, prior to release to the environment;
- Bulkhead barriers will be installed at the nearest downstream manhole in each sewer which connects to an existing downstream sewer (e.g. along Terry Fox Drive). These bulkheads will trap any sediment carrying flows, thus preventing any construction-related contamination of existing sewers;
- Seepage barriers will be constructed in any temporary drainage ditches;

- Construction vehicles will leave the site at designated locations. Exits will consist of a bed of granular material, in order to minimize the tracking of mud off-site;
- Any stockpiled material will be properly managed to prevent these materials from entering the sewer systems. Any stockpiles must be surrounded by toed in silt fencing to prevent run-off; and
- Until rear yards are sodded or until streets are asphalted and curbed, all catch basins and manholes will be constructed with a geotextile filter fabric located between the structure frame and cover.

As noted below in Section 4.4 (below), toed in silt fencing will be installed around the development perimeter as temporary wildlife exclusion fencing. This silt fencing will also help to mitigate sediment and erosion impacts, as it will separate the development from surrounding retained habitat areas.

4.3 Adjacent Lands and Significant Features

Mitigation measures to protect adjacent natural features during tree clearing are discussed in Section 4.0 of the TCR (Appendix A).

4.4 Wildlife and Species at Risk

Mitigation for Species at Risk (SAR) and wildlife during tree clearing are summarized here. The following mitigation is required during all phases of tree clearing to avoid impacts to Blanding's Turtle and other wildlife. These recommendations include provisions from the City of Ottawa (2015) *Protocol for Wildlife Protection During Construction*:

- **Pre-Stressing:** Prior to tree removal the area should be pre-stressed by traversing the area with a loud noise such as an excavator horn. This will encourage wildlife to leave the area;
- **Tree Clearing Direction:** Tree clearing should proceed from west to east. This will encourage wildlife to leave the work area and move in the direction of the retained wildlife movement corridor along the First Line Road Allowance, from which wildlife can access the retained natural areas to the north and south. During tree clearing, a path of retained habitat connecting to the open space blocks along the First Line Road Allowance must be maintained at all times in order to provide wildlife with a corridor to escape the work area;
- **Temporary Fencing:** Silt fencing will be arranged to also function as temporary wildlife exclusion fencing to reduce the likelihood of turtles, frogs, mammals and other wildlife from entering the work area. Temporary fencing should be utilized until completion of permanent exclusion barriers (discussed below). Silt fencing should be put in place prior to the turtle active season (April 15th to October 15th). Fencing should be put in place between

the edge of the development and the edges of the open space blocks throughout the development area;

- **Inspections:** The fencing and work area will be inspected by a qualified biologist prior to commencement of work to ensure that the arrangement will reduce the likelihood of wildlife entering the work area. Any wildlife or significant wildlife habitat features that are encountered will be identified and marked;
- **Sweeps:** Prior to vegetation clearing, preconstruction sweeps of vegetated areas will be undertaken to ensure wildlife are not present. Construction staff will be briefed on wildlife and SAR mitigation (see below) and a designated staff member will be required to conduct daily sweeps each morning prior to commencement of work to ensure wildlife have not entered the work area. The designated staff member will also periodically inspect the temporary exclusion fencing to ensure no gaps or holes in the fence exist;
- **Staff Briefing:** Tree clearing staff will be provided with briefing materials summarizing mitigation requirements. This briefing will identify the potential presence of SAR, it will provide instructions on the necessary mitigation measures, it will include photographs to identify SAR, and instructions on what to do if an SAR or other wildlife is encountered. Contact details for the OMNRF, the project biologist, and other wildlife officials will be included;
- **General Provisions:** General provisions for Site management will be included in the briefing. These include:
    - Do not harm, feed, or unnecessarily harass wildlife;
    - Drive slowly and avoid hitting wildlife;
    - Keep Site tidy and free of garbage and food wastes. Secure all garbage in appropriate sealed containers;
    - Ensure proper Site drainage so that standing water does not accumulate on Site. This will reduce the likelihood that turtles and other wildlife may enter the Site;
    - Any stockpiles should be properly secured with silt fencing to prevent wildlife from accessing areas of loose fill; and
- **Timing Windows:** Vegetation clearing and site preparation will be undertaken outside of the active season of Blanding's Turtle (outside of April 15th to October 15th) in order to minimize the likelihood of encountering turtles moving around the landscape. This also avoids the core migratory bird breeding season of April 15th to August 15th each year.

4.4.1 Permanent Blanding's Turtle Exclusion Fencing

As noted above, silt fencing will be arranged to also function as temporary wildlife exclusion fencing during construction. Ultimately, a permanent Blanding's Turtle exclusion system may be required in order to meet regulatory requirements under the Endangered Species Act (ESA) and in order to permanently prevent Blanding's Turtles (and other wildlife) from entering the future development.

An existing Blanding's Turtle exclusion system was installed along Terry Fox Drive during the construction of the road by the City of Ottawa, and similar systems are planned as part of the Richardson Ridge Phase 4 and KNL Phase 7 ESA authorization requirements (MES 2016; OMNRF 2016b). It is anticipated that it will likely be necessary for the Kanata Highlands Phase 1 development to install an exclusion system between the future development area and the retained open space blocks. Barriers which are impassable to Blanding's Turtles (e.g. fencing, retaining walls, and/or other suitable barriers), will likely need to be installed along the eastern and north development boundaries (along the edges of the open space blocks). This system will most likely tie into the adjacent fencing system for Richardson Ridge Phase 4 (to the south) and the existing turtle exclusion fencing along Terry Fox Drive (to the north). The western and southern development boundaries are not likely to require Blanding's Turtle exclusion barriers, as the development interface will connect to adjacent developed areas (e.g. Terry Fox Drive and the developed portion of Richardson Ridge Phase 4) in these areas. In addition to preventing Blanding's Turtle and other wildlife from entering the development, the fencing system will also reduce the impact of human usage on the retained natural areas, by ensuring that open space blocks are difficult to access outside of designated trails/access points. The fencing also serves to mitigate potential impacts from predation, human interference, and road mortality.

Fencing requirements will be discussed and confirmed in consultation with the OMNRF through the ESA review and authorization process.

4.4.2 Homeowner Awareness Packages

Homeowner awareness and education packages will be provided to educate homeowners on the presence of SAR including Blanding's Turtle. These packages will highlight the role of the Blanding's Turtle exclusion system and will encourage homeowners not to interfere with the fencing. In addition, educational signs are intended to be posted along recreational trails to further educate residents. The homeowner awareness packages will encourage homeowners to report SAR sightings to the OMNRF.

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5.0 CUMULATIVE EFFECTS

Cumulative effects were considered in the design of the mitigation measures outlined in Section 4.0, particularly in the creation of SAR mitigation measures and the open space retention plan. The following represent potential cumulative effects associated with the development of Kanata Highlands Phase 1:

- Cumulative effect of loss of forest habitat (e.g. cumulative loss of wildlife habitat);
- Cumulative impact of edge effects on degrading remaining forest habitat and wetlands;
- Cumulative effect of increased human population in the area; and
- Cumulative effect of development on the loss of SAR habitat and populations, including Blanding's Turtle and Butternut Trees.

The cumulative loss of forest habitat and its associated value as wildlife habitat has been addressed through the retention of the approximately 7 ha of open space within the development. These areas will ultimately be protected from further development through City ownership, and hence there is no risk of cumulative loss of forest habitat beyond the areas designated for development.

As discussed in Section 4.1, cumulative impacts associated with edge effects on remaining forest habitat, as well as the effects of an increased human population in the area, were considered in the development of the mitigation measures.

The Endangered Species Act (ESA) process requires that proponents either mitigate all impacts to a species, or that they provide an overall benefit to the species, both of which imply no net loss of habitat functionality. Mitigation and compensation measures to meet this requirement will be determined in consultation with the OMNRF through the ESA authorization and review process.

6.0 MONITORING

Construction stage monitoring requirements are outlined in Section 4.4 (above). Monitoring will include pre-construction sweeps to inspect fencing and vegetation prior to clearing, and daily sweeps by construction staff. Monitoring requirements related to Butternut Trees and Blanding's Turtle will be determined in consultation with the OMNRF through the ESA authorization and review process.

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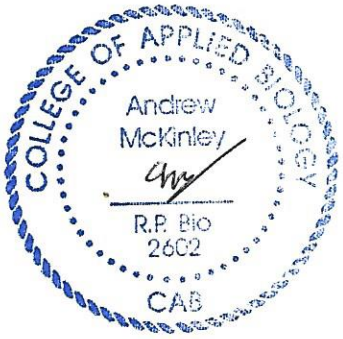
7.0 CLOSURE

We trust that the above information is sufficient; should you have any questions or require further information, please do not hesitate to contact the undersigned, at your convenience.

Sincerely,



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APPENDIX A

Tree Conservation Report

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1.0 INTRODUCTION AND BACKGROUND

McKinley Environmental Solutions (MES) was retained by Richcraft Homes Inc. to prepare a Detailed Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) for the proposed development of the Kanata Highlands Phase 1 property in Kanata (Ottawa), Ontario (the Site). The EIS and TCR are presented as an integrated submission and should be read together.

The Kanata Highlands Phase 1 property (the Site) is located in Kanata (Ottawa), Ontario and is approximately 25.6 ha in size. The Site is currently zoned Development Reserve and is vacant. Historically portions of the Site were farmed, and currently the Site is occupied by a mixture of Cultural Meadow, Cultural Thicket, a small Deciduous Swamp, and Deciduous Forest. The Site is bounded along its western side by Terry Fox Drive. The Richardson Ridge Phase 4 development is in the late stages of subdivision approval, and is located along the southern Site boundary. The eastern edge of the Site is bounded by the unopened First Line Road Allowance, beyond which is the KNL Phase 7 development. KNL Phase 7 is also in the late stages of subdivision approval. Both Richardson Ridge Phase 4 and KNL Phase 7 are anticipated to commence tree clearing and development activities in 2017, and so the majority of the area south and east of the Site is anticipated to be under development prior to the commencement of work in Kanata Highlands Phase 1. Therefore, the majority of the area south and east of the Site will be developed in future, although adjacent retained open space blocks will be preserved in both of the adjacent subdivisions. The area north of Site includes a triangular shaped parcel owned by the City of Ottawa. Tree protection measures to preserve trees on adjacent properties are included below.

The Site will be developed as a subdivision with approximately 159 single and 276 townhome and back-to-back units, for a total of approximately 435 residential units. The subdivision will also include an approximately 0.9 ha park block, and an approximately 6.5 ha open space block in the northern part of the Site. A 19 m wide open space block will also be retained along the edge of the First Line Road Allowance, in order to provide a wildlife movement corridor. This retained block will be approximately 0.5 ha in size, so the total open space dedication is approximately 7 ha.

The proposed extent of tree retention is anticipated to preserve the significant features and functions of the woodlot. The arrangement of the open space blocks will ensure that a portion of the interior forest habitat within the Site is protected, and the critical buffer areas around adjacent features (e.g. Shirley's Brook and the Deciduous Swamp in the northern part of the Site) will also be preserved. The major linkage function of the Site will be maintained by the arrangement of retained blocks along the First Line Road Allowance, which will provide a connection to adjacent natural areas. In addition, the passive recreational functions currently provided by the woodlot will continue to be provided by the

7 ha of retained open space areas, which will be transferred to the City of Ottawa following development. It is therefore anticipated that the currently proposed 7 ha of open space dedication will be sufficient to preserve the significant features and functions of the woodlot.

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1.1 Definitions

The following terms are used throughout this report:

- Diameter at Breast Height (dbh) means the measurement of the trunk of a tree at a height of 120 cm above grade for trees 15 cm diameter or greater, and at a height of 30 cm above grade for trees less than 15 cm diameter.
- The Critical Root Zone (CRZ) is 10 centimeters from the trunk of the tree for every centimeter of trunk dbh. The CRZ is calculated as dbh x 10 cm.

2.0 TREE INVENTORY METHODS

Site visits to identify plant species within the Site were conducted by Bernie Muncaster of Muncaster Environmental Planning (MEP) on May 6th, June 1st, June 26th, August 25th, and August 26th, 2011 (MEP 2011). An updated site visit to inventory trees and confirm the plant inventory was conducted by Andrew McKinley of McKinley Environmental Solutions (MES) on November 16th, 2016. Vegetative communities on Site were classified following the Ecological Land Classification (ELC) methodology (OMNRF 1998; Lee 2008), with guidance from the Ontario Wetland Evaluation System (OWES) (OMNRF 2014f). This included a three (3) season plant inventory to document the occurrence of plants, create a master plant list, and to identify and delineate plant communities according to the ELC methodology.

Tree measurements were completed on November 26th, 2016. TCR plots were distributed equally throughout the treed portion of the Site to attain accurate representative tree coverage. Plots were measured 5 m by 10 m to give a total survey area of 50 m^2 (for each plot) and were assessed for the presence of tree specimens with 5 cm dbh or greater. Plots were distributed evenly within the treed portion of the proposed development area to achieve the desired density of 1 plot per hectare. A total of twenty-six (26) plots were undertaken. These plots were then scaled up to estimate the density per hectare of each species reaching 5 cm dbh or greater. Trees within each plot that were 5 cm dbh or greater were measured with the use of a D-tape which is a calibrated diameter at breast height (dbh) tape. Measurements for each of the qualifying trees within the plot were taken 1.2 m from the ground surface and recorded. The tree inventory results are subdivided into different forest communities according to the ELC community type that the tree survey plot occurred within. The vegetation mapping is shown in Figure 2.

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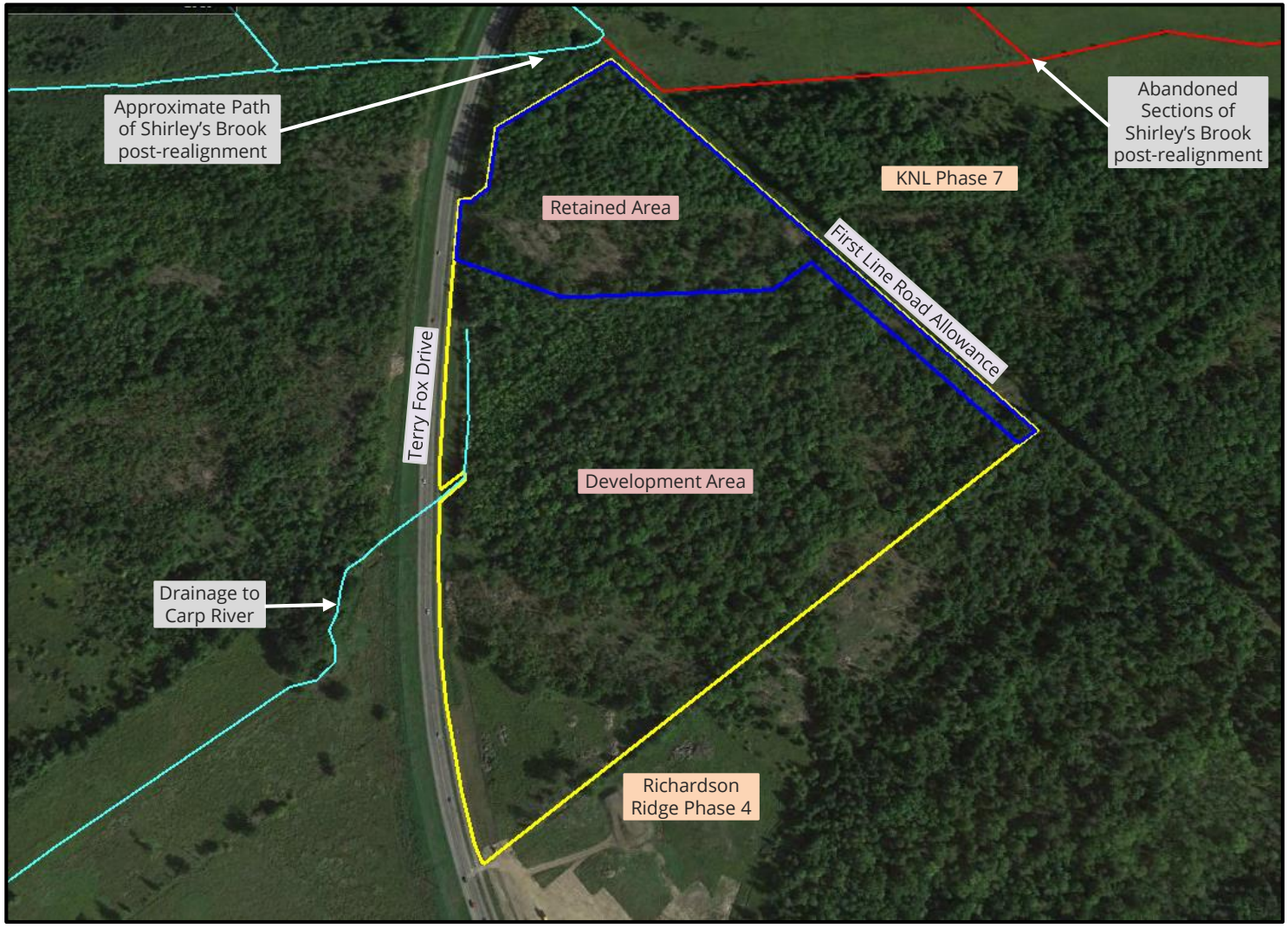
FIGURE 1: SITE OVERVIEW

Kanata Highlands Phase 1, Ottawa, Ontario
Detailed Environmental Impact Statement (EIS)



Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

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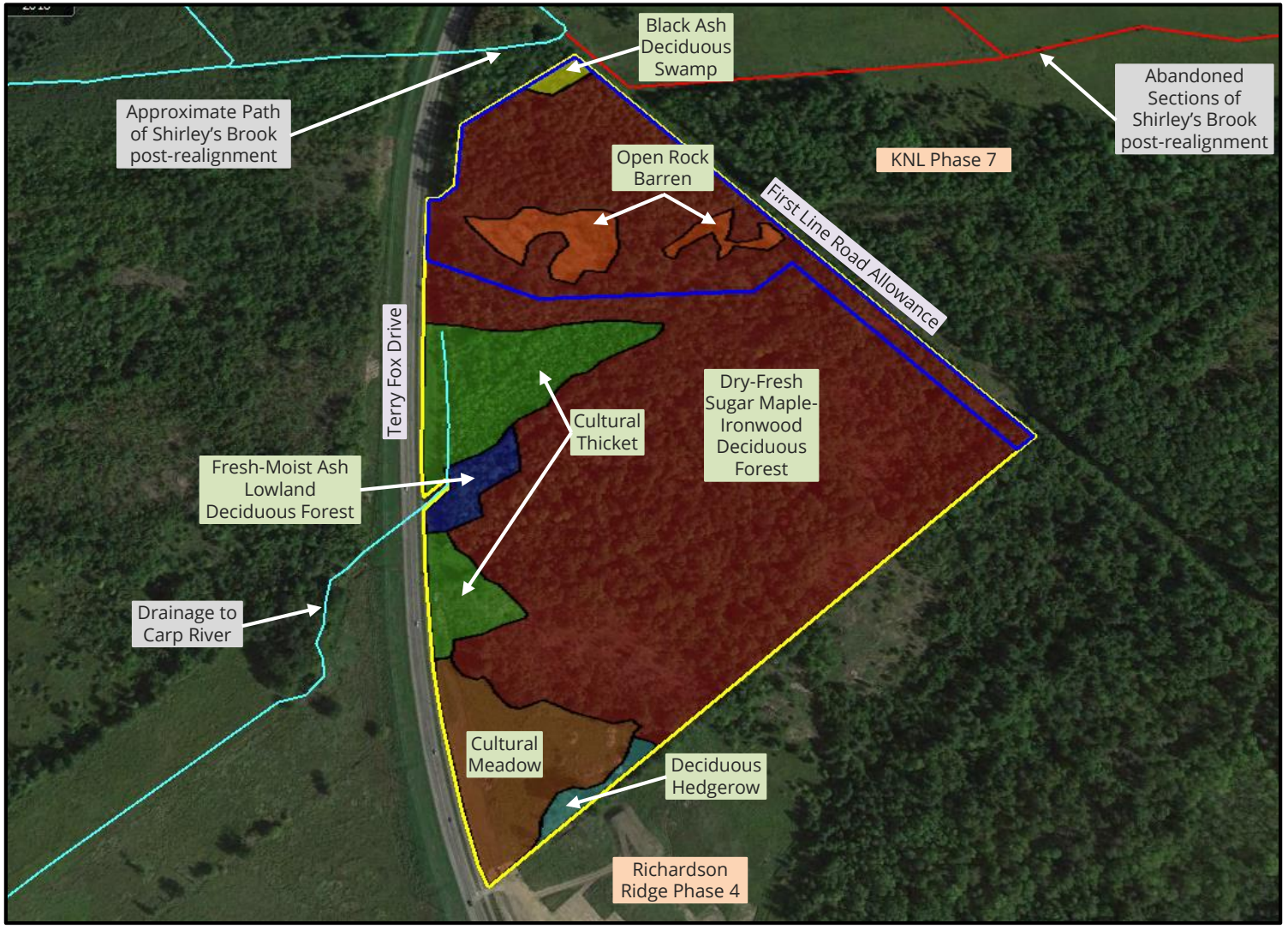
FIGURE 2: VEGETATION COMMUNITIES

Kanata Highlands Phase 1, Ottawa, Ontario
Detailed Environmental Impact Statement (EIS)

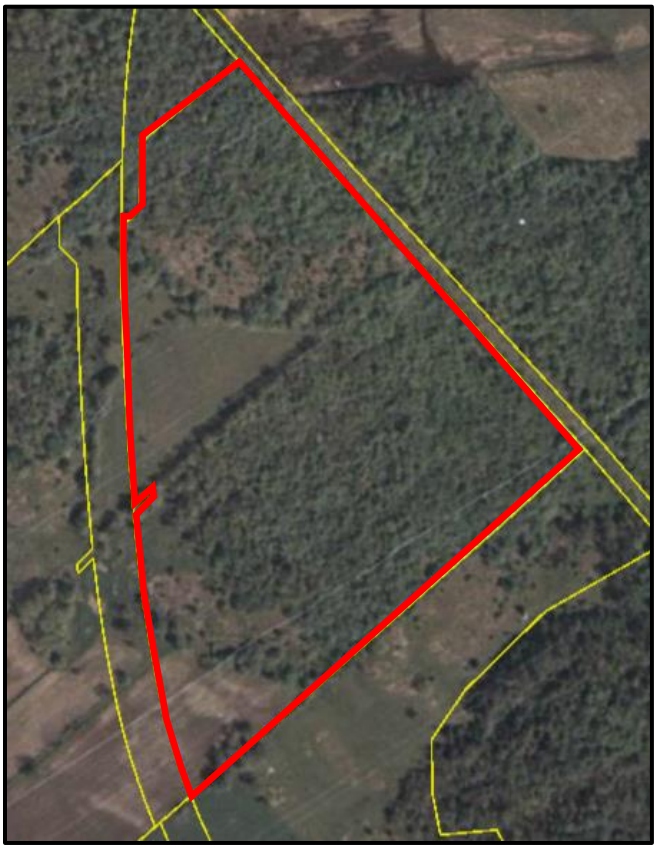


Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

3.0 TREE INVENTORY

3.1 Site History

As shown in Figure 2, the majority of the Site is occupied by a mature secondary growth deciduous forest. The 1976 aerial photograph, which is the oldest available for the Site, shows that the configuration of the forested area has remained relatively unchanged for at least 40 years (Photograph 1, below). Portions of the western part of the Site adjacent to Terry Fox Drive were farmed in 1976 and have since been abandoned. These former agricultural areas are presently occupied by recently disturbed Cultural Thicket/Cultural Meadow, as shown in Figure 2.



Photograph 1: Historic Air Photo from 1976. Property boundary shown in red. Note majority of the Site was forested in 1976 with agricultural activity in the western part of the Site (adjacent to the current location of Terry Fox Drive). The extent of the Site that is forested has remained relatively unchanged since at least 1976 (Photo from City of Ottawa 2016).

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3.2 Tree and Vegetation Composition

Vegetation communities within the Site are described in detail in Sections 3.2 and 3.3 of the EIS report. The tree cover within each vegetative community is summarized here. Refer to the EIS report for additional plant community composition detail and photographs. Table A (below) summarizes the tree inventory results.

- **Cultural Meadow:** A Cultural Meadow is present in the southwest corner of the Site. This area was farmed in 1976 and has since been abandoned. Several piles of mulch from historic tree clearing are present in the Cultural Meadow. This mulch results from tree clearing that occurred historically prior to the current ownership, and is not due to any recent vegetation removal activities. Shrub and tree cover is very sparse in the Cultural Meadow.
- **Cultural Thicket:** Two (2) areas of Cultural Thicket are present in the western part of the Site, near Terry Fox Drive. These areas were farmed in 1976 and have since been left to regenerate. Within the Cultural Thicket, shrub cover including Glossy Buckthorn, Hawthorn, Common Buckthorn, and Common Lilac is dominant. Regenerating American Elm (59%), White Ash (18%), and Bur Oak (12%) are the most common trees, with the diameter at breast height (dbh) of these species ranging between approximately 15 and 30 cm. White Pine up to 45 cm dbh are present in the northern part of the Cultural Thicket, as are isolated Sugar Maple.
- **Deciduous Hedgerow:** A Deciduous Hedgerow is present along the southern Site boundary. This hedgerow is aligned in a west-east direction and includes American Elm (57%), Sugar Maple (14%), Red Oak (14%), and American Basswood (14%). A few isolated mature trees are present, including several large Bur Oak growing on a rock knoll, which are up to 60 cm dbh in size. However, the majority of trees in the Deciduous Hedgerow are relatively small, ranging in size from approximately 15 to 30 cm dbh.
- **Dry to Fresh Sugar Maple – Ironwood Deciduous Forest (FODM5-4):** The majority of the Site is occupied by a Dry to Fresh Sugar Maple – Ironwood Deciduous Forest. As noted above, the forest is secondary growth but is mature, and has been in place in its current configuration since at least 1976. Ironwood (26%) and Sugar Maple (26%) are co-dominant. American Beech (7%), Red Oak (7%), and Green Ash (7%) are all highly represented. White Ash, Yellow Birch, American Basswood, Bur Oak, White Birch, Balsam Fir, Black Cherry, and White Elm are present, although each of these species accounts for <5% of stems. Most Ironwood stems are relatively small, varying between approximately 10 and 15 cm dbh. Sugar Maple are the main canopy forming tree, varying in size between approximately 10 cm and 45 cm dbh, while isolated older specimens up to 70 cm dbh are also present. American Beech shows a similar size distribution, with the forest dominated by trees of a moderate age with a few larger specimens present. Large Red Oak up to 85 cm dbh are present in some areas, although the average tree size is approximately 25 to 50 cm dbh. Green Ash, White Ash, Yellow Birch, and American Basswood show a similar size distribution, with most

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stems approximately 10 to 25 cm dbh, and isolated older individuals up to 40 cm dbh present for each species. White Ash trees throughout the forest showed signs of extensive damage by the invasive Emerald Ash Borer. There are several shallow ephemeral woodland pools within the forested area, as discussed in Section 3.3 of the EIS.

- **Fresh to Moist Green Ash Lowland Deciduous Forest Type (FODM7-2):** In the vicinity of the culvert at Terry Fox Drive, there is a low lying area occupied by a Fresh to Moist Green Ash Lowland Deciduous Forest. This forest is dominated by Green Ash (55%), with American Basswood (24%) and American Elm (17%) highly represented. Sugar Maple, White Birch, and Yellow Birch are also present. The majority of trees in this area are relatively young, ranging in size from 10 cm to 25 cm dbh. Shrub cover is sparse and includes Glossy Buckthorn, Black Currant, and Wild Red Raspberry.
- **Open Rock Barren:** Large bedrock outcrops are present within the forested area of the Site, creating several Open Rock Barrens. These areas include exposed bedrock with either no soil or very shallow soils overlying bedrock. Tree cover at the edges of the Open Rock Barrens and in depressions with deeper soil is dominated by Red and Bur Oak, with some larger specimens of both species present. Ironwood, Sugar Maple, and Ash saplings are also common. Most of the exposed bedrock lacks tree cover, and is dominated by mosses, lichens, and disturbed vegetation that grows well in shallow soils.
- **Black Ash Mineral Deciduous Swamp (SWDM2-1):** A low lying area exists at the very northern edge of the Site adjacent to Shirley's Brook. This area is occupied by a Black Ash Mineral Deciduous Swamp that is dominated by Black Ash (69%), Red Maple (31%) and isolated Silver Maple. The Black Ash trees vary in size between approximately 10 to 20 cm dbh, whereas the Red Maple are larger, ranging between approximately 10 to 60 cm dbh.

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Table A: Inventory of Trees Identified on Site

Common Name	Scientific Name	Average DBH	DBH Standard Deviation	% Occupancy	Estimated Stems Per Hectare
Cultural Thicket					
American Elm	*Ulmus americana*	15	10	59%	667
White Ash	*Fraxinus americana*	24	4	18%	200
Bur Oak	*Quercus macrocarpa*	14	0	12%	133
Sugar Maple	*Acer saccharum*	10	N/A	6%	67
White Pine	*Pinus strobus*	41	N/A	6%	67
Deciduous Hedgerow					
American Elm	*Ulmus americana*	21	9	57%	800
Sugar Maple	*Acer saccharum*	20	N/A	14%	200
Red Oak	*Quercus rubra*	15	N/A	14%	200
American Basswood	*Tilia americana*	26	N/A	14%	200
Dry to Fresh Sugar Maple – Ironwood Deciduous Forest (FODM5-4)					
Ironwood	*Ostrya virginiana*	10	4	26%	473
Sugar Maple	*Acer saccharum*	24	17	26%	462
American Beech	*Fagus grandifolia*	13	13	17%	305
Red Oak	*Quercus rubra*	28	24	7%	126
Green Ash	*Fraxinus pennsylvanica*	18	6	7%	126
White Ash	*Fraxinus americana*	23	16	5%	84
Yellow Birch	*Betula alleghaniensis*	24	7	4%	74
American Basswood	*Tilia americana*	29	9	3%	53
Bur Oak	*Quercus macrocarpa*	55	16	2%	32
White Birch	*Betula papyrifera*	25	10	1%	21
Balsam Fir	*Abies balsamea*	11	0	1%	21
American Elm	*Ulmus americana*	14	N/A	1%	11

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Common Name	Scientific Name	Average DBH	DBH Standard Deviation	% Occupancy	Estimated Stems Per Hectare
Fresh to Moist Green Ash Lowland Deciduous Forest Type (FODM7-2)					
Green Ash	*Fraxinus pennsylvanica*	14	6	55%	1600
American Basswood	*Tilia americana*	17	5	24%	700
American Elm	*Ulmus americana*	10	3	17%	500
Sugar Maple	*Acer saccharum*	6	N/A	3%	100
Black Ash Mineral Deciduous Swamp (SWDM2-1)					
Black Ash	*Fraxinas nigra*	13	4	69%	1800
Red Maple	*Acer rubrum*	35	24	31%	800

N/A Values in the DBH Standard Deviation are due to only one tree of that species being observed within the sample plot.

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3.2 Tree Preservation

Figure 1 shows the proposed arrangement of retained open space areas. This includes a large approximately 6.5 ha block of forested habitat that is to be preserved in the northern part of the Site, as well as a 19 m wide open space block along the edge of the First Line Road Allowance. The retained block along the First Line Road Allowance will be approximately 0.5 ha in size, and so the total open space dedication is approximately 7 ha. The rationale for the extent and layout of the retained open space areas is discussed below in relation to the Significant Woodlot Assessment.

3.3 Significant Woodlot Assessment

The City of Ottawa Natural Heritage System Overlay (Schedule L3) identifies the forested portion of the Site as part of the Natural Heritage System (City of Ottawa 2014). The following is a summary of the Significant Woodlot criteria for the forested areas of the Site (OMNRF 2005):

- **Woodland Size Criteria** – The Site is within the Carp River Subwatershed, which has approximately 34% forest cover (MVCA 2013). In planning areas with 30-60% forest cover, woodlots 50 ha or larger would qualify under the size criteria. The Site itself is 25.6 ha in size and approximately 22 ha of this is forested. As noted above, the Site is bounded to the west by Terry Fox Drive and to the east by the First Line Road Allowance. The First Line Road Allowance is maintained as a cleared corridor 20 to 30 m wide, and hence separates the Kanata Highlands Phase 1 Site from forested areas to the east. An approximately 1.5 ha triangular parcel of swamp is present north of the Site on City of Ottawa land, through which Shirley's Brook flows. Beyond this is Terry Fox Drive. As discussed in Sections 1.2 and 3.7 of the EIS, the Richardson Ridge Phase 4 development is located along the southern Site boundary. The Richardson Ridge Phase 4 development is in the late stages of subdivision approval and is anticipated to commence tree clearing in 2017. Following tree clearing, the majority of the forest immediately south of the Site will be removed. However, the Richardson Ridge Phase 4 development includes a block of retained habitat along the First Line Road Allowance, as well as a large open space block south of the development, which encompasses the westward extension of the Kizell Provincially Significant Wetland (KPSW). The total area scheduled to be retained around Richardson Ridge Phase 4 (south of Kanata Highlands Phase 1) is approximately 17 ha. Therefore, the total connected forest/wetland area following development of Richardson Ridge Phase 4 would be approximately 40.5 ha. This includes the currently forested areas within Kanata Highlands Phase 1 (22 ha), the treed City of Ottawa parcel to the north (1.5 ha) and the retained areas of Richardson Ridge Phase 4 to the south (17 ha). This is less than the 50 ha threshold for woodlot size, and hence the continuous forested area is too small to qualify under the woodland size criteria.

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- **Interior Forest Habitat** – Forested areas 100 m from an opening that is 20 m or greater in size are considered interior forest habitat. Interior forest habitat within the Kanata Highlands Phase 1 development is shown in Figure 3 (below). Existing openings within the southwest part of the Site, as well as anticipated tree clearing within Richardson Ridge Phase 4 (scheduled for 2017), impact the extent of interior forest habitat. The presence of Terry Fox Drive along the western Site boundary, and the First Line Road Allowance (which is maintained as a 20 to 30 m wide cleared corridor) along the eastern Site boundary further reduce the extent of interior forest habitat. With these factors taken into account, the extent of interior forest habitat will be approximately 7.9 ha, following completion of adjacent tree clearing in 2017. In planning areas with 30 to 60% forest cover, woodlots with 8 ha or more of interior forest habitat would be considered significant (OMNRF 2005). The extent of interior forest habitat that will be present within the Site following the completion of currently scheduled tree clearing in adjacent developments will hence be too small for the woodlot to qualify under the interior forest criteria.
- **Proximity to Other Woodlands/Habitats** – Woodlots within 30 m of another significant feature meet this criteria. As discussed in Sections 3.3 and 3.4 of the EIS report, there are several designated natural habitats in the vicinity of the Site. There is a small Deciduous Swamp at the northern edge of the open space block within the Site, beyond which is Shirley's Brook. It should be noted that the small wetland patch along Shirley's Brook (in the City parcel north of the Site) was previously shown as part of the South March Highlands Provincially Significant Wetland (SMHPSW). However, in recent OMNRF mapping, the construction of Terry Fox Drive is shown to have separated this area from the larger wetland complex located northwest of the road, and so the wetland area in the City parcel immediately north of the open space block may no longer be considered part of the SMHPSW. Regardless, this wetland patch and Shirley's Brook are located north of the proposed open space block more than 250 m from the proposed development edge. Therefore, no significant negative impacts on the wetland and Shirley's Brook are anticipated. The entirety of the Site is beyond the 120 m regulated area around the KPSW (located south and southeast of the Site). Terry Fox Drive also separates the Site from adjacent areas of the SMHPSW and the associated South March Highlands Candidate Life Science Area of Scientific and Natural Interest (ANSI) (located northwest of the Site). Therefore, impacts on the KPSW and SMHPSW are not a significant concern for the proposed development, as no portion of these wetlands is within 120 m of the Site. As discussed in Section 3.6 of the EIS, no area of the Site is within 30 m of designated areas of Category 1 or 2 Blanding's Turtle habitat. Therefore, the currently proposed extent of open space retention is sufficient to protect the adjacent designated habitats which occur within 30 m of the Site (e.g. the Deciduous Swamp and Shirley's Brook north of the Site).

- **Linkages** – As discussed in Sections 1.2 and 3.7 of the EIS report, the Richardson Ridge Phase 4 development is located along the southern Site boundary. The Richardson Ridge Phase 4 development is in the late stages of subdivision approval and is anticipated to commence tree clearing in 2017. The Richardson Ridge Phase 4 development includes a block of retained habitat along the First Line Road Allowance, which will connect to the 19 m wide (0.5 ha) open space block along the First Line Road Allowance within the Kanata Highlands Phase 1 Site. Together, these open space blocks will provide a wildlife movement corridor, which is designed to provide connectivity between the 6.5 ha open space block in the northern part of the Kanata Highlands Phase 1 Site, and the western extension of the KPSW (located south of Richardson Ridge Phase 4). The retained areas in Kanata Highlands Phase 1 and Richardson Ridge Phase 4 also connect to adjacent retained areas within KNL Phase 7 (e.g. the remainder of the KPSW to the east), as well as to the Carp River (west) and the South March Highlands Conservation Forest (SMHCF) (northwest) through existing wildlife passage culverts under Terry Fox Drive (Figure 4). In combination, the preserved open space areas in Kanata Highlands Phase 1, Richardson Ridge Phase 4, and KNL Phase 7 will provide movement corridors for wildlife between the major open space blocks within each subdivision, as well as the KPSW, the Carp River, and the SMHCF.
- **Water Protection** – Woodlots that are 50 m from the top of valley, sensitive groundwater discharge areas, sensitive recharge areas, sensitive headwater areas, or which contain fish habitat, are considered to provide a water protection function. As noted above, the current arrangement of the open space blocks will protect Shirley's Brook and the Deciduous Swamp in the northern part of the Site. There is a small channel in the western part of the Site which connects to a stormwater easement and culvert under Terry Fox Drive. This stormwater easement and culvert were established as a temporary measure during the construction of Terry Fox Drive, and were to be retained only until development of the area east of Terry Fox Drive was complete. Following subdivision development, the culvert will no longer be required for either wildlife movement or for conveyance of surface drainage. As such, the stormwater easement is scheduled to be transferred for development prior to registration. The channel is not a significant aquatic habitat feature, and so transfer and development of the stormwater easement is not expected to result in a significant negative environmental impact. Once the channel is removed, there will be no need to maintain a vegetated buffer in this area of the Site.
- **Woodlot Diversity** – The plant diversity of the forested areas of the Site is high compared to adjacent urban areas of Ottawa, but is similar to forested areas in the rural lands located to the north and northwest of the Site within the Carp River subwatershed. This includes the nearby South March Highlands Conservation Forest (SMHCF) and forested areas of the Carp Hills.

- **Uncommon Characteristics** – Uncommon forest types, environmental features, or plant communities may contribute to woodlot significance. Also, forest stands older than 100 years would be considered significant. The oldest available air photo (Photograph 1, above) shows that the extent of forest within the Site has remained consistent since 1976. This suggests that the forest cover throughout the majority of the Site is more than 40 years old. While the majority of the forested area is likely older than 40 years, the size distribution of trees and the species composition suggest that the area is secondary growth, and hence is not likely to be 100 years of age or older. As noted above, the forested areas of the Site do not have any uncommon characteristics compared to adjacent forested areas of the SMHCF and the nearby Carp Hills.
- **Economic and Social** – Woodlots which contribute special economic or social functions can qualify under this criteria. The Site has been utilized by local residents for mountain biking and cross country skiing historically, although the Site remains private property and in some cases recreational access has not been authorized. The approximately 7 ha of proposed open space blocks will be transferred to the City of Ottawa following development, and will hence be available for continued passive recreational usage by local residents. This will preserve the social function provided by the woodlot.

In summary, the proposed extent of tree retention is anticipated to preserve the significant features and functions of the woodlot. The arrangement of the open space blocks will ensure that a portion of the interior forest habitat within the Site is protected, and the critical buffer areas around adjacent features (e.g. Shirley's Brook and the Deciduous Swamp in the northern part of the Site) will also be preserved. The major linkage function of the Site will be maintained by the arrangement of retained blocks along the First Line Road Allowance, which will provide a connection to adjacent natural areas. In addition, the passive recreational functions currently provided by the woodlot will continue to be provided by the 7 ha of retained open space areas, which will be transferred to the City of Ottawa following development. It is therefore anticipated that the currently proposed 7 ha of open space dedication will be sufficient to preserve the significant features and functions of the woodlot.

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FIGURE 3: BIRD SURVEY POINTS & INTERIOR FOREST HABITAT

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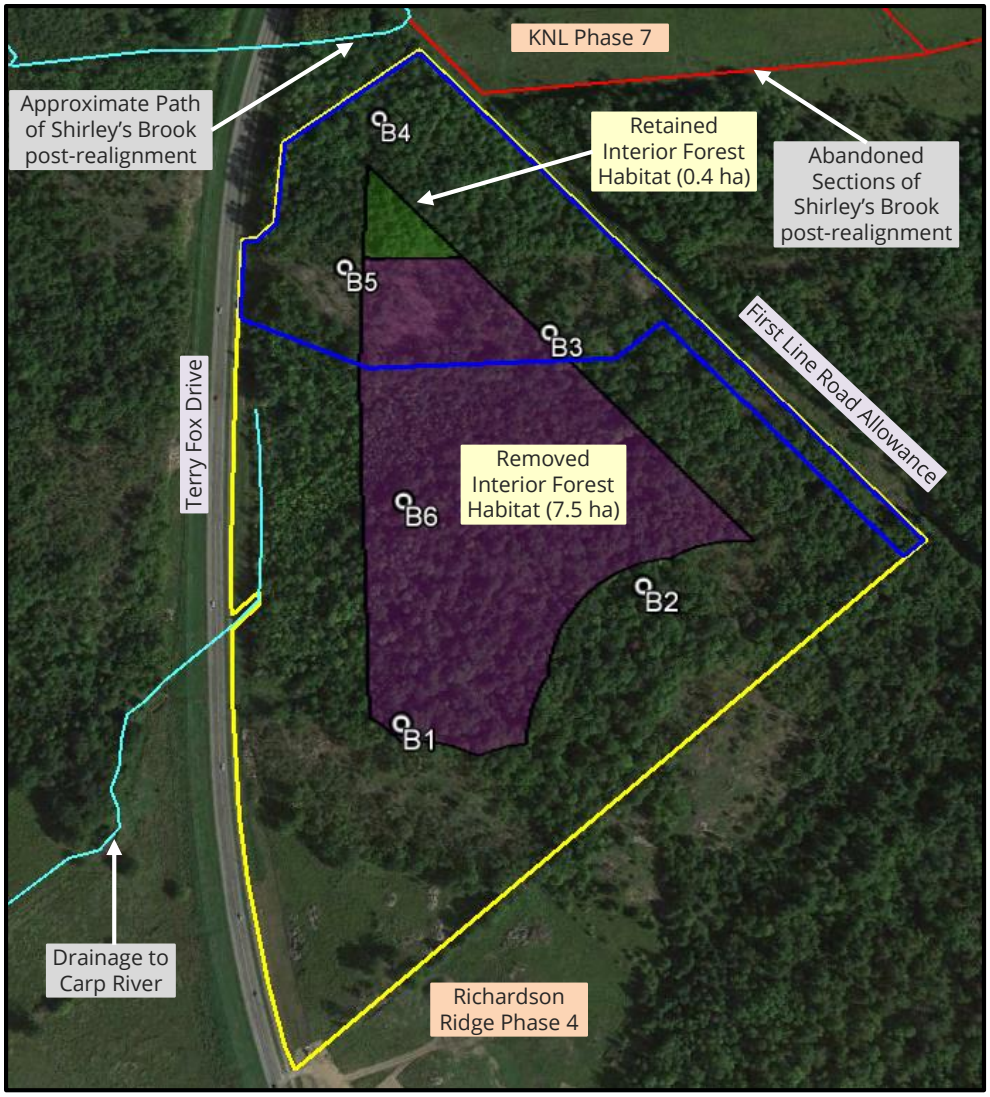
Kanata Highlands Phase 1, Ottawa, Ontario
Detailed Environmental Impact Statement (EIS)

December 2016



- Property Boundary
- Watercourses
B2 - Bird Survey Points

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

4.0 VEGETATION REMOVAL AND TREE MITIGATION

For mitigation measures related to Wildlife and Species at Risk during tree clearing, refer to Section 4.4 of the attached EIS report.

During the initial stage of tree clearing, a 6 m wide buffer of retained trees at the back of lots that back onto the open space blocks and/or adjacent natural areas should be retained. Trees within this 6 m buffer will be removed selectively in consultation with the City's Forester, once final grading and excavation requirements have been determined. Trees will be retained within the 6 m buffer at the back of lots where feasible. In order to protect trees adjacent to the tree clearing area, the following mitigation measures will be implemented where trees occur in open space blocks and/or adjacent natural areas close to construction activities:

- Soil compaction, vegetation damage, intrusion of construction equipment and other potential impacts on the core of the root system of trees adjacent to the edge of the work area will be avoided by restricting grading and other site alteration activities to the tree clearing area. This will be achieved by providing construction fencing or suitable boundary definition to clearly mark the boundaries between the edge of the tree clearing area and adjacent properties (where required) during each phase of tree clearing and construction; and
- If off-site vegetation damage occurs, an arborist should review any damage to determine the best course of action to restore the original vegetative functions.

Tree mitigation measures have been proposed to help protect and preserve trees around the proposed development. Trees to be retained adjacent to the tree clearing area should be protected by the following tree preservation measures:

- Mark the edge of the tree clearing area to ensure only designated trees are removed. Protect the critical root zone (CRZ) of retained trees, where the CRZ is established as being 10 cm from the trunk of a tree for every centimeter of trunk dbh. The CRZ is calculated as dbh x 10 cm;
- When trees to be removed overlap with the CRZ of trees to be retained, cut roots at the edge of the CRZ and grind down stumps after tree removal. Do not pull out stumps. Ensure there is not root pulling or disturbance of the ground within the CRZ;
- If roots must be cut, roots 20 mm or larger should be cut at right angles with clean, sharp horticultural tools without tearing, crushing, or pulling;
- Do not place any material or equipment within the CRZ of any tree;
- Do not attach any signs, notices, or posters to any tree;
- Do not damage the root system, trunk, or branches of any tree; and
- Ensure that exhaust fumes from all equipment are directed away from any tree canopy.

5.0 REPLANTING

Where landscaping is required during the development of the lots, it is recommended that planting should emphasize the use of native trees and shrubs. Planting of Ash trees should be avoided due to the high likelihood that any planted Ash trees will become infested with Emerald Ash Borer. Specific planting requirements should be identified through a Landscaping Plan, which will be developed at the detailed design stage.

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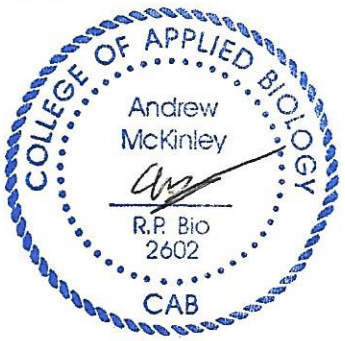
6.0 CLOSURE

We trust that the above information is sufficient; should you have any questions or require further information, please do not hesitate to contact the undersigned, at your convenience.

Sincerely,



Dr. Andrew McKinley, EP, RP Bio.
Senior Biologist, McKinley Environmental Solutions

Bernie Muncaster, Principal
Muncaster Environmental Planning

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7.0 REFERENCES

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APPENDIX B

Master Plant List

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TABLE A: VEGETATION

Common Name	Scientific Name	Provincial S rank	Brunton Significance Ranking for the City of Ottawa (Brunton, 2005)	Vegetation Type
Northern Blue Flag	Iris Versicolor	S5	Common	Aquatic
Common Cattail	Typha latifolia	S5	Common	Aquatic
Maidenhair Fern	Adiantum pedatum	S5	Uncommon	Fern
Evergreen Woodfern	Dryopteris intermedia	S5	Common	Fern
Ostrich Fern	Matteuccia struthiopteris	S5	Common	Fern
Sensitive Fern	Onoclea sensibilis	S5	Common	Fern
Bracken fern	Pteridium aquilinum	S5	Common	Fern
Marsh Fern	Thelypteris palustris	S5	Common	Fern
Brome Grass	Bromus sp.		n/a	Grass
Barnyard Grass	Echinochloa crusgalli	SNA	Common	Grass
Timothy	Phleum pratense	SNA	Common	Grass
Meadow grass sp.	Poa sp.		Common	Grass
Green Foxtail	Setaria viridis	SNA	Common	Grass
Wild Leek	Allium tricoccum	S4	Uncommon	Herbaceous
Common Ragweed	Ambrosia artemisiifolia	S5	Common	Herbaceous
Sharplobe Hepatica	Anemone acutiloba	S5	Common	Herbaceous
Round-lobe Hepatica	Anemone americana	S5	Common	Herbaceous
Canada Anemone	Anemone canadensis	S5	Common	Herbaceous
Field Pussytoes	Antennaria neglecta	S5	Common	Herbaceous
Wild Columbine	Aquilegia canadensis	S5	Common	Herbaceous
Wild Sarsaparilla	Aralia nudicaulis	S5	Common	Herbaceous
Common Burdock	Arctium minus	SNA	Common	Herbaceous
Jack in the Pulpit	Arisaema triphyllum	S5	Common	Herbaceous
Mugwort	Artemisia vulgaris	SNA	Common	Herbaceous
Wild Ginger	Asarum canadense	S5	Common	Herbaceous
Common Milkweed	Asclepias syriaca	S5	Common	Herbaceous
Blue Cohosh	Caulophyllum thalictroides	S5	RS (1): Antrim Woodlot	Herbaceous
Broadleaf Enchanter's Nightshade	Circaea canadensis	S5	Common	Herbaceous
Canada Thistle	Cirsium arvense	S5	Common	Herbaceous

Bull Thistle	Cirsium vulgare	SNA	Common	Herbaceous
Carolina Springbeauty	Claytonia caroliniana	S5	Common	Herbaceous
Horseweed	Conyza canadensis	S5	Common	Herbaceous
Pink Lady’s-slipper	Cypripedium acaule	S5	Common	Herbaceous
Wild Carrot	Daucus carota	SNA	Common	Herbaceous
Queen Anne's Lace	Daucus carota	SNA	Common	Herbaceous
Deptford Pink	Dianthus armeria	SNA	Common	Herbaceous
Dutchman's-breeches	Dicentra cucullaria	S5	Common	Herbaceous
Viper's Bugloss	Echium vulgare	SNA	Common	Herbaceous
Mayflower	Epigaea repens	S5	RS (1): Constance Bay Sand Hills.	Herbaceous
Broadleaf Helleborine	Epipactis helleborine	SNA	Common	Herbaceous
Daisy Fleabane	Erigeron annuus	S5	Common	Herbaceous
Philadelphia Fleabane	Erigeron philadelphicus	S5	Common	Herbaceous
Trout Lily	Erythronium americanum	S5	Common	Herbaceous
Bigleaf Aster	Eurybia macrophylla	S5	Common	Herbaceous
Narrow-leaved Goldenrod	Euthamia graminifolia	S5	Common	Herbaceous
Woodland Strawberry	Fragaria vesca	S5	Uncommon	Herbaceous
Common Strawberry	Fragaria virginiana	S5	Common	Herbaceous
White Bedstraw	Galium mollugo	SNA	Common	Herbaceous
Herb Robert	Geranium robertianum	SNA	Common	Herbaceous
Yellow Avens	Geum aleppicum	S5	Common	Herbaceous
White Avens	Geum canadense	S5	Common	Herbaceous
Yellow Hawkweed	Hieracium caespitosum	SNA	Uncommon	Herbaceous
Common St. John's-wort	Hypericum perforatum	SNA	Common	Herbaceous
Elecampane	Inula helenium	SNA	Common	Herbaceous
Ox-eye Daisy	Leucanthemum vulgare	SNA	Common	Herbaceous
Bird's-foot Trefoil	Lotus corniculatus	SNA	Common	Herbaceous
False Solomon's Seal	Maianthemum racemosum	S5	Common	Herbaceous
Black Medic	Medicago lupulina	SNA	Common	Herbaceous
Naked Mitrewort	Mitella nuda	S5	Common	Herbaceous
Wild Parsnip	Pastinaca sativa	SNA	Common	Herbaceous
Blue Phlox	Phlox divaricata	S4	Uncommon	Herbaceous
Common Plantain	Plantago major	S5	Common	Herbaceous

Purslane	Portulaca oleracea	SNA	Common	Herbaceous
Silver Cinquefoil	Potentilla argentea	SNA	Uncommon	Herbaceous
Small-flowered Buttercup	Ranunculus abortivus	S5	Common	Herbaceous
Common Buttercup	Ranunculus acris	SNA	Common	Herbaceous
Black Eyed Susan	Rudbeckia hirta	SU	Common	Herbaceous
Curled Dock	Rumex crispus	SNA	Common	Herbaceous
Bloodroot	Sanguinaria canadensis	S5	Common	Herbaceous
Yellow Stonecrop	Sedum acre	SNA	Common	Herbaceous
Wild Mustard	Sinapis arvensis	SNA	Common	Herbaceous
Canada Goldenrod	Solidago canadensis	S5	Common	Herbaceous
Gray Goldenrod	Solidago nemoralis	S5	Common	Herbaceous
Narrow leaved Meadowsweet	Spiraea alba	S5	Common	Herbaceous
Calico Aster	Symphyotrichum lateriflorum	SNR	Common	Herbaceous
Dandelion	Taraxacum officinale	SNA	Common	Herbaceous
Heartleaf Foamflower	Tiarella cordifolia	S5	Common	Herbaceous
Poison Ivy	Toxicodendron rydbergii	S5	Common	Herbaceous
Goat's-beard	Tragopogon dubius	SNA	Common	Herbaceous
Red Clover	Trifolium pratense	SNA	Common	Herbaceous
White Trillium	Trillium grandiflorum	S5	Common	Herbaceous
Common Mullein	Verbascum thapsus	SNA	Common	Herbaceous
Blue Vervain	Verbena hasta	S5	Common	Herbaceous
Tufted Vetch	Vicia Cracca	SNA	Common	Herbaceous
Common Blue Violet	Viola sororia	S5	Common	Herbaceous
Wool-grass	Scirpus cyperinus	S5	Common	Sedge
Red Osier Dogwood	Cornus sericea (stolonifesa)	S5	Common	Shrub
Hawthorn	Crataegus chrysocarpa	S5	Common	Shrub
Glossy Buckthorn	Frangula alnus	SNA	Common (aggressive invasive)	Shrub
Choke Cherry	Prunus virginiana	S5	Common	Shrub
Common Buckthorn	Rhamnus cathartica	SNA	Common (aggressive invasive)	Shrub
Black Currant	Ribes americanum	S5	Common	Shrub
Common Blackberry	Rubus allegheniensis	S5	Common	Shrub
Wild Red Raspberry	Rubus idaeus	S5	Common	Shrub
Lilac	Syringa vulgaris	SNA	Common	Shrub

Balsam Fir	Abies balsamea	S5	Common	Tree
Red Maple	Acer rubrum	S5	Common	Tree
Silver Maple	Acer saccharinum	S5	Common	Tree
Sugar Maple	Acer saccharum	S5	Common	Tree
Yellow Birch	Betula alleghaniensis	S5	Common	Tree
White Birch	Betula papyrifera	S5	Common	Tree
Bitternut Hickory	Carya cordiformis	S5	Common	Tree
American Beech	Fagus grandifolia	S4	Common	Tree
Black Ash	Fraxinas nigra	S5	Common	Tree
White Ash	Fraxinus americana	S5	Common	Tree
Green Ash	Fraxinus pennsylvanica	S5	Common	Tree
Butternut	Juglans cinerea	S3	Endangered	Tree
Domestic Apple	Malus sylvestris	n/a	Common	Tree
Ironwood	Ostrya Virginiana	S5	Common	Tree
White Spruce	Picea glauca	S5	Common	Tree
Eastern White Pine	Pinus strobus	S5	Common	Tree
Large Tooth Aspen	Populus grandidentata	S5	Common	Tree
Black Cherry	Prunus serotina	S5	Common	Tree
Bur Oak	Quercus macrocarpa	S5	Common	Tree
Red Oak	Quercus rubra	S5	Common	Tree
Staghorn Sumac	Rhus hirta	S5	Common	Tree
White Cedar	Thuja occidentalis	S5	Common	Tree
American Basswood	Tilia americana	S5	Common	Tree
American or White Elm	Ulmus americana	S5	Common	Tree
Hog-peanut	Amphicarpaea bracteata	S5	Common	Vine
Black Swallow-wort	Cynanchum louiseae	SNA	Rare (invasive)	Vine
Virginia Creeper	Parthenocissus vitacea	S5	Common	Vine
Riverbank Grape	Vitis riparia	S5	Common	Vine

Provincial ranks (assigned by NHIC)
S5 = Very common within the province with > 1000 occurences, populations or records S4 = Common within the province with 21 - 1000 occurences, populations or records S3 = Rare within the province with 6 - 20 occurences, populations or records SNA = Ranking not available SE5 = Very common exotic with > 1000 occurences, populations or records within the province S? = Unranked, or if followed by a ranking, temporarily assigned (eg. S4?)

APPENDIX C

Bird and Wildlife Sightings

McKINLEY ENVIRONMENTAL SOLUTIONS
613-620-2255
mckinleyenvironmental@gmail.com
www.mckinleyenvironmental.com

TABLE B: BIRDS	
Common Name	**Scientific Name**
Cedar Waxwing	Bombycilla cedrorum
Canada Goose	Branta canadensis
Northern Cardinal	Cardinalis cardinalis
Turkey Vulture	Cathartes aura
Veery	Catharus fuscescens
Hermit Thrush	Catharus guttatus
Northern Flicker	Colaptes auratus
Eastern Wood-Pewee	Contopus virens
American Crow	Corvus brachyrhynchos
Blue Jay	Cyanocitta cristata
Gray Catbird	Dumetella carolinensis
Wilson's Snipe	Gallinago delicata
Common Yellowthroat	Geothlypis trichas
Wood Thrush	Hylocichla mustelina
Dark-eyed Junco	Junco hyemalis
Ring-billed Gull	Larus delawarensis
Song Sparrow	Melospiza melodia
Black-and-white Warbler	Mniotilta varia
Great Crested Flycatcher	Myiarchus crinitus
Rose-breasted Grosbeak	Pheucticus ludovicianus
Downy Woodpecker	Picoides pubescens
Hairy Woodpecker	Picoides villosus
Black-capped Chickadee	Poecile atricapilla
Common Grackle	Quiscalus quiscula
Ruby-Crowned Kinglet	Regulus calendula
Eastern Phoebe	Sayornis phoebe
Ovenbird	Seiurus aurocapilla

Chestnut-sided Warbler	Setophaga pensylvanica
Yellow Warbler	Setophaga petechia
American Redstart	Setophaga ruticilla
White-breasted Nuthatch	Sitta carolinensis
Yellow-bellied Sapsucker	Sphyrapicus varius
American Goldfinch	Spinus tristis
Chipping Sparrow	Spizella passerina
Field Sparrow	Spizella pusilla
European Starling	Sturnus vulgaris
American Robin	Turdus migratorius
Warbling Vireo	Vireo gilvus
Red-eyed Vireo	Vireo olivaceus
Mourning Dove	Zenaida macroura

TABLE C: OTHER WILDLIFE

Common Name	Scientific Name
American Toad	Anaxyrus americanus
Common Porcupine	Erethizon dorsatum
Northern Leopard Frog	Lithobates pipiens
Wood Frog	Lithobates sylvaticus
Groundhog	Marmota monax
White Tailed Deer	Odocoileus virginianus
Common Raccoon	Procyon lotor
Eastern Grey Squirrel	Sciurus carolinensis
Red Squirrel	Sciurus vulgaris
Eastern Chipmunk	Tamias striatus
Common Garter Snake	Thamnophis sirtalis

APPENDIX D

OMNRF Information Request Response

McKINLEY ENVIRONMENTAL SOLUTIONS
613-620-2255
mckinleyenvironmental@gmail.com
www.mckinleyenvironmental.com

Ministry of Natural Resources

Kemtpville District
P.O. Box 2002
10 Campus Drive
Kemtpvile, ON K0G 1J0

Tel.: (613) 258-8470
Fax.: (613) 258-3920

Ministère des Richesses naturelles

District de Kemptville
CP 2002
10 Campus Drive
Kemptville, ON K0G 1J0

Tél.: (613) 258-8470
Téléc.: (613) 258-3920

August 8, 2011

Bernie Muncaster
Muncaster Environmental
491 Buchanan Cres.
Ottawa, Ontario
613-748-3753
bmuncaster@rogers.com

Attention: Mr. Muncaster

Subject: Information Request – Proposed Urban Residential Development, Lot 8, Concession 1, Geographic Township of March
Our File No. 2011_MAR_1373

The Ministry of Natural Resources (MNR) Kemptville District has carried out a preliminary review of the area in order to identify any potential natural resource and natural heritage values in the area.

Following a review of natural heritage values and data, the South March Highlands Candidate Provincial Life Sciences Area of Natural and Scientific Interest (ANSI) is located within the site. There are also multiple unevaluated wetland areas on-site and the South March Highlands Provincially Significant Wetland (PSW) is located within 100m of the proposed site. A significant portion of the lot consists of woodland area. Both wetlands and woodlands provide habitat for a diversity of species, including species at risk. The property includes Shirley's Brook and a white-tailed deer wintering yard, which may provide additional species habitat.

If any in-water works are to occur in relation to the project, there is a timing restriction period for which work in water can take place. In addition, where at all possible, the bed of waterbodies should not be disturbed so as not to alter the existing rock material. Proper sediment and erosion controls are required to be employed during this project.

If there is to be work in water and/or disturbance of the stream bed, additional and more detailed plans are requested by the MNR for review. A work permit from the Ministry of Natural Resources may be required pending further details regarding the proposed works. Furthermore, the local Conservation Authority should be contacted regarding possible permitting required for these particular works at the site in question.

With the new Endangered Species Act (ESA, 2007) in effect, it is important to understand which species and habitats exist in the area and the implications of the legislation. A review of the Natural Heritage Information Centre (NHIC) and internal records indicate that there is a high potential for butternut (Endangered Species-END) on-site and a potential for American eel (END) in Shirley's Brook. Bobolink (threatened-THR), Blanding's turtle (THR), Loggerhead Shrike (END), and a sensitive endangered species have also been documented in proximity to the area. Aerial photographs suggest the presence of potential habitat for Whip-poor-will (THR) and Chimney Swift (THR) on the site or in proximity to it. Care should be taken during the proposed work to ensure mitigation measures are in place so that no impact on these species occurs. Given the proximity and scale of the proposed work, these species may be directly affected, therefore due diligence should be taken during the work to ensure no impact on these species occurs. If the proposed activity is known to have an impact on the species mentioned above or any other SAR, an ESA permit is required. Species listed as Special Concern on the SARO list are not protected under the Endangered Species Act, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act.

A rigorous check/survey should be completed each day prior to activities commencing to ensure all species are outside the project area to avoid harming the species. If any of these or any other species at risk are discovered throughout the course of the surveys, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNR should be contacted immediately to determine if ESA authorization is required.

Bobolink, Chimney Swift, Whip-poor-will, and Loggerhead Shrike receive general habitat protection and thus any potential works should consider disturbance of possible important habitat. None of the other species listed above currently receive habitat protection, however the listed Endangered and Threatened species all receive species protection under Section 9 of the Endangered Species Act, 2007 (ESA).

Although no other threatened or endangered species or their habitat have been documented in the area, these features may be present and this list should not be considered complete.

There are several species listed by SARO as Special Concern that may be encountered within the project area. Habitat has been identified within the project area that appears suitable for one or more of these species, or one or more of these species has been documented to occur either on-site or nearby. Species listed as Special Concern on the SARO list are not protected under the Endangered Species Act, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act. Please consider the following Special Concern species prior to any activities being carried out:

- Snapping turtle
- Milksnake

- Eastern ribbonsnake

Endangered Species Act, 2007, and Species at Risk in Ontario Background

The ESA 2007 (http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statues-07e06_e.htm) protects both species and habitat. Section 9 of the ESA "prohibits killing, harming, harassing, capturing, possessing, collecting, buying, selling, trading, leasing or transporting species that are listed as threatened, endangered or extirpated". Section 10 of the ESA, 2007 prohibits damaging or destroying habitat of endangered or threatened species. Protected habitat is either based on general definition in the Act or prescribed through a regulation. The ESA 2007 defines general habitat as an area on which the species depends, directly or indirectly, to carry on its life processes, including reproduction, rearing, hibernation, migration or feeding.

It is important to be aware that changes may occur in both species and habitat protection. The ESA applies to listed species on the Species at Risk in Ontario List (SARO) (www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/246809.html). The Committee on the Status of Species in Ontario (COSSARO) meets regularly to evaluate species for listing and/or re-evaluate species already listed. As a result, species' designations may change that could in turn change the level of protection they receive under the ESA 2007. Also, habitat protection provisions for a species may change e.g. if a species-specific habitat regulation comes into effect. The regulation would establish the area that is protected as habitat for the species.

Information with respect to SAR can be found in the online database at the Natural Heritage Information Centre (NHIC) (http://nhic.mnr.gov.on.ca/nhic.cfm). The NHIC compiles, maintains and distributes information on species at risk and updates its information on a regular basis. We encourage you to routinely check the NHIC database to obtain the most up to date SAR information for proposed work locations. However, while the NHIC database is the best available source of data, even when there are no known occurrences documented at a site, there is a possibility that SAR may occur at a proposed work location.

> **Please note:** The advice in this letter is valid until **August 8, 2012** and may become invalid if:
>
> 1. The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species.
> 2. Additional occurrences of species are discovered.
> 3. Habitat protection comes into force for one of the above-mentioned species through the creation of a habitat regulation.

This letter has been prepared to provide preliminary information to support compliance with the ESA 2007 and does not address other requirements under other federal or provincial laws and regulations.

Although this data represents the MNR's best current available information, it is important to note that a lack of occurrence at a site does not mean that there are no Species at Risk (SAR)

at the location. The MNR continues to encourage ecological site assessments to determine the potential for other SAR occurrences. When a SAR does occur on a proposed site, it is recommended that the proponent contact the MNR for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the Act (such as Section 9 or 10), the proponent must contact the MNR to discuss the potential for application of certain permits (Section 17) or agreement (Regulation 242/08). For specific questions regarding the Endangered Species Act (2007) or species at risk, please contact a district Species at Risk Biologist at sar.kemptville@ontario.ca.

Sincerely,

Laura Melvin
Resource Management Planner
laura.melvin@ontario.ca