



GOLDER

REPORT

Environmental Impact Statement

Proposed Development of the Wright Lands, Ottawa, Ontario

Submitted to:

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c/o Regional Group of Companies Inc.
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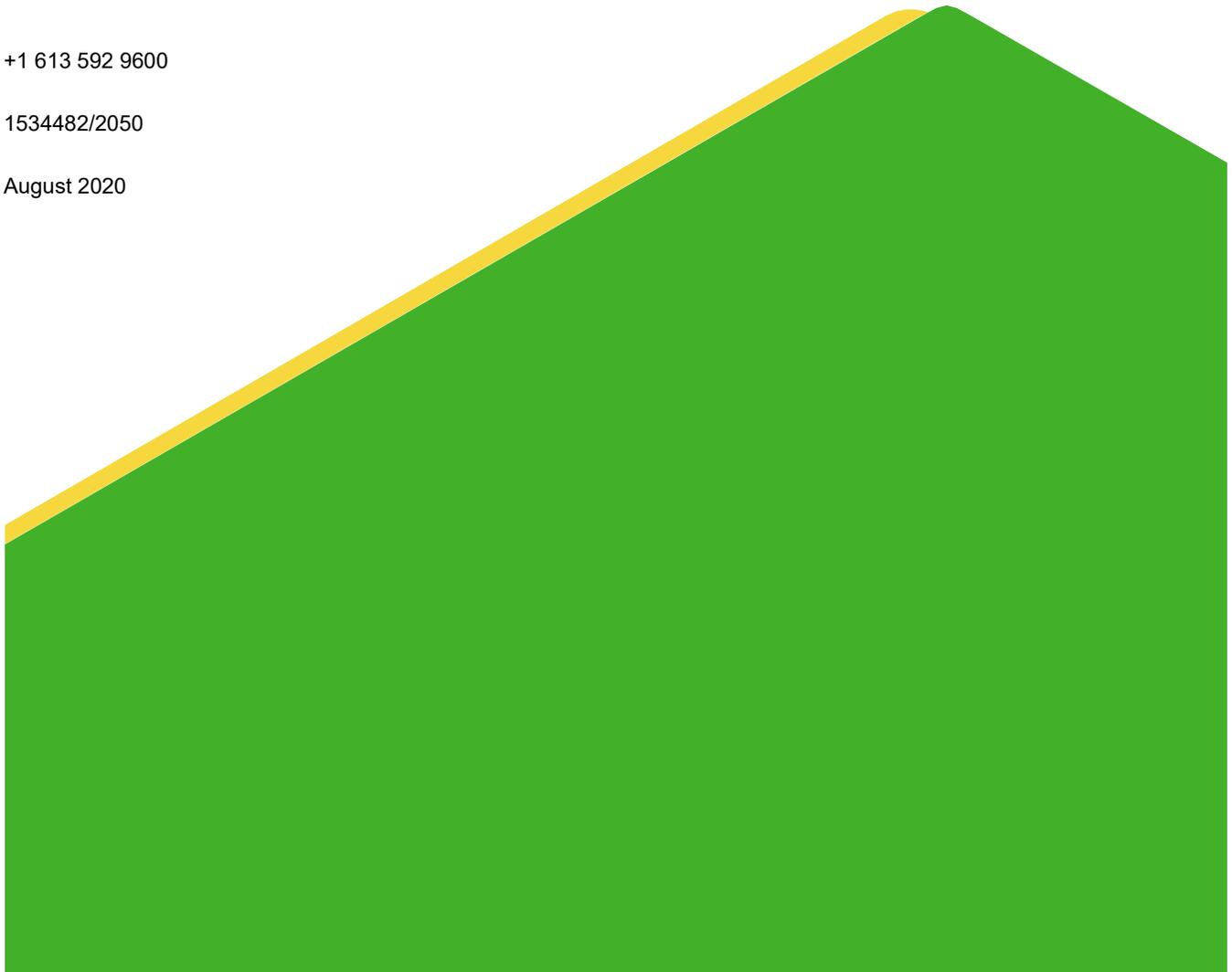
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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by Nicholls Island Holdings Inc. to complete an Environmental Impact Statement (EIS) for the property known as the Wright Lands, located on Part I of Lot 24, Broken Front Concession (Rideau Front), Geographic Township of Gloucester, City of Ottawa, Ontario (the Site; Figure 1). Golder's assessment included, to the extent possible, the area within 120 metres (m) of the Site (study area) through review of aerial imagery and observing from areas of public access (e.g., roads, Site boundary). Golder understands that the proposed works on the Site will consist of the construction of a new residential development.

This report has been prepared in accordance with the EIS guidelines presented in the City of Ottawa Official Plan (OP) (Ottawa 2015; 2013). Appendix A to this report is a Tree Conservation Report (TCR) (Golder 2020b), which has been prepared for the Site in accordance with the City's Tree Conservation Report Guidelines (Ottawa 2016).

A Terms of Reference (TOR) was prepared and circulated to the City and Rideau Valley Conservation Authority (RVCA) on June 17 and July 7, 2016, respectively, to allow the City and RVCA an opportunity to discuss any concerns, review the proposed study design, and reach an agreement on the scope of the EIS. Comments were received from these agencies on July 8 and July 12, 2016, respectively, and those comments have been incorporated in this report, as appropriate.

1.1 Site Description

The Site has an approximate area of 4.82 hectares (ha) and is occupied primarily by active agricultural lands and existing rural residential. The Site is generally bounded to the east by River Road, to the west by the RCMP campground (which is located along the east bank of the Rideau River), to the north by undeveloped land and to the south by active agriculture. The Site is generally flat, with a gentle slope from east to west. A less than 5 m high slope separates the Site from the adjacent lower-lying RCMP campground. A tributary of the Rideau River flows along the northern edge of the Site (the northern watercourse) through a wooded valley; also, running north-south through the Site is a linear drainage feature that outflows to the northern watercourse. There are no buildings or structures on the Site except for a single maintained residence in the northeast corner.

2.0 ENVIRONMENTAL POLICY CONTEXT

The Site is located in the City of Ottawa. Documents reviewed to gain an understanding of the natural heritage features and regulations that are relevant to the Site include the following:

- Provincial Policy Statement (MMAH 2014)
- City of Ottawa Official Plan (Ottawa 2013)
- *Endangered Species Act* (Ontario 2007)
- *Species at Risk Act* (Canada 2002)
- *Fisheries Act* (Canada 1985)
- *Migratory Birds Convention Act* (Canada 1994)
- Ontario Regulation 174/06 Regulation of *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (Ontario 2006), administered by the RVCA

An overview of the above noted legislation and policy documents is discussed below.

2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) was issued under Section 3 of the *Planning Act* (MMAH 2014).

The natural heritage policies of the PPS indicate that:

2.1.4 Development and site alteration shall not be permitted in:

- 1.0 Significant wetlands in Ecoregions 5E, 6E and 7E
- 2.0 Significant coastal wetlands.

2.1.5 Unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in:

- a) Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E
- b) Significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River)
- c) Significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River)
- d) Significant wildlife habitat
- e) Significant areas of natural and scientific interest
- f) Coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b)

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

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

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

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

2.2 Species at Risk

2.2.1 Species at Risk Act (SARA)

At the federal level, species at risk designations for species occurring in Canada are initially determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment and Climate Change, species are added to the federal List of Wildlife Species at Risk (Canada 2002). Species that are included on Schedule 1 as endangered or threatened are afforded protection of critical habitat on federal lands under the *Species at Risk Act* (SARA) (Canada 2002). On private or provincially-owned lands, only aquatic species and migratory birds listed as endangered, threatened or extirpated are protected under SARA, unless ordered by the Governor in Council, or the project is federally funded or federally governed.

2.2.2 Endangered Species Act (ESA)

Species at risk designations for species in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO), and if approved by the provincial Minister of the Environment, Conservation and Parks, species are added to the provincial *Endangered Species Act* (ESA) that came into effect June 30, 2008 (Ontario 2007). The legislation prohibits the killing or harming of species identified as ‘endangered’ or ‘threatened’ in the various schedules to the Act. The ESA provides general habitat protection to all species listed as threatened or endangered. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law as a regulation of the ESA. There are exemptions under the Act for the treatment of certain species and their habitats for some activities.

2.3 Fisheries Act

The purpose of the *Fisheries Act* (Canada 1985) is to maintain healthy, sustainable and productive Canadian fisheries through the prevention of pollution and the protection of fish and their habitat. All projects undertaking in-water or near-water work must comply with the provisions of the *Fisheries Act*.

All projects where work is being proposed that cannot avoid impacts to fish or fish habitat require a Fisheries and Oceans Canada (DFO) project review (DFO 2019). If it is determined through the DFO review process that the project will result in death of fish or harmful alteration, disruption or destruction (HADD) of fish habitat, an authorization is required under the *Fisheries Act*. This includes projects that have the potential to obstruct fish passage or affect flows.

Proponents of projects requiring a Fisheries Act Authorization are required to also submit a Habitat Offsetting Plan, which provides details of how the death of fish and/or HADD of fish habitat will be offset, and outlines associated costs and monitoring commitments. Proponents also have a duty to notify DFO of any unforeseen activities during the project that cause harm to fish or fish habitat, and outline the steps taken to address them.

2.4 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) (Canada 1994) prohibits the killing or capturing of migratory birds, as well as any damage, destruction, removal or disturbance of active nests. It also allows the Canadian government to pass and enforce regulations to protect various species of migratory birds, as well as their habitats. While Environment and Climate Change Canada (ECCC) can issue permits allowing the destruction of nests for scientific or agricultural purposes, or to prevent damage being caused by birds, it does not typically allow for permits in the case of industrial or construction activities.

2.5 Rideau Valley Conservation Authority

The Rideau Valley Conservation Authority (RVCA) is the governing body that regulates flood potential and natural heritage features in the Rideau River watershed. Development within regulated areas is governed by Regulation 174/06 *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (Ontario Legislative Assembly 2006).

Regulation 174/06 was made pursuant to Section 28 of the *Conservation Authorities Act* and is specific to the RVCA. Development is not necessarily restricted within the RVCA regulated area; however, it designates an area that triggers the need for a permit and, in most cases, an accompanying EIS.

Development of portions of the Site will require a permit from the RVCA under the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* regulation as they are located within the RVCA regulated area.

2.6 City of Ottawa

Proponents are required, under the City OP (Ottawa 2013), to prepare an EIS following the City guidelines (Ottawa, 2015), which documents the occurrence of significant natural heritage features in, and adjacent to, the proposed development area. The policies in the OP address both natural features and natural functions.

The Site is designated as General Urban Area (Schedule B) in the City OP. The RCMP campground immediately to the west is mapped as Major Open Space.

The Site lies within the Riverside South Community Design Plan (CDP) area (Ottawa 2016). As in the OP, the lands west of the Site are designated as Open Space in the CDP. This designation extends across the north of the Site where the northern watercourse is located.

According to Section 4.7.3 of the OP, developments located adjacent to surface water features are subject to setback requirements as laid out in the applicable watershed, subwatershed or environmental management plans. In the absence of such plans, minimum setbacks are prescribed in the OP, which are the greater of:

- Development limits as established by the regulatory flood line;
- Development limits as established by the geotechnical limit of the hazard lands;
- 30 m from the normal high-water mark of rivers, lakes and streams, as determined in consultation with the conservation authority; or,
- 15 m from the existing top of bank, where there is a defined bank.

3.0 DESCRIPTION OF DEVELOPMENT PROPOSAL

The proposed development takes into account the constraints and opportunities on the Site. The area of the Site is 4.82 ha. Of this, 3.14 ha will be developed with residential lots and road rights of way, and the remaining 1.67 ha will be greenspace. Lots are located to capitalise on the view of the Rideau River to the west and proximity to the valley in the northern part of the Site. The street layout will enable connection to future development to the south and the continuation of a modified grid network. A combination of 27 detached dwellings and 27 townhouses are proposed. The detached dwellings are arranged around the perimeter of the Site. Six will be on 15 m (50-foot) wide lots and 21 on 12.8 metre (42-foot) wide lots. The townhouses are in blocks of three and are grouped in the central area and close to the Site entry. Two new public streets will provide access to the lots from River Road. It is expected that both streets will connect to future development in the south.

The proposed development includes a setback to the top of slope along the northern and western edges of the Site. The setback along the western edge is minimum 15 m. The setback along the northern edge is a minimum of 15 m with the following minor exceptions: where filling is proposed associated with Lots 6-8 (linear drainage feature); and Lots 2-4 and 20 (Figure 4). The setback areas currently consist of row crops and lawn with one small area of trees (associated with the linear drainage feature). These areas will be naturalized as part of the proposed development, and may eventually accommodate a future multi-use pathway planned by the City.

Water quality treatment will be provided by the end-of-pipe Riverside South Community Stormwater Management Facility Pond 5. Pond 5, which is located off-Site on lands to the north, was designed for a total drainage area of approximately 294 ha, providing an Enhanced level of water quality protection (80% long-term removal of total suspended solids). Water quantity control within the tributary development area is required to reduce the peak flow entering the minor system to the design inflow rate per the Riverside South Community Infrastructure Servicing

Study Update – Rideau River Area, prepared by Stantec (June 2017). As identified in the Riverside South Community Master Drainage Plan Update Rideau River Study Area, prepared by Stantec (March 2016), additional water quantity control is not required by Pond 5 as it will discharge directly to the Rideau River.

The proposed development will explore the following stormwater best management practices (BMPs) and low impact development (LID) techniques to mitigate the reduction in groundwater infiltration / recharge resulting from the proposed development:

- bio-swales, and/or infiltration trenches in the side-yard areas to promote infiltration
- roof leaders should be directed to grassed rear yard areas

By implementing stormwater management BMPs and LIDs as part of the storm drainage design, the impacts of development on the hydrologic cycle can be reduced. The use and implementation of BMPs and LIDs will be reviewed again during the detailed design process.

4.0 METHODS

4.1 Background Review

Background data reviewed for this project included existing documents and a number of information sources. The review was also used to identify species at risk (SAR) that have been reported as occurring in the local landscape surrounding the Site, or have the potential to occur. Sources reviewed consisted of:

- Ministry of Natural Resources and Forestry (MNR) Natural Heritage Information Centre (NHIC) Make-a-Map geographic explorer for SAR, (S1 S3) species reported as occurring in the vicinity of the Site, and natural areas information queries (MNR 2019)
- Characterization of Ottawa's Watersheds (Ottawa 2011)
- Riverside South Community Design Plan (Ottawa 2016)
- Lower Rideau River Subwatershed Report (RVCA 2012)
- Atlas of Breeding Birds of Ontario (Cadman et. al 2007)
- eBird online database (Audubon 2019)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Bat Conservation International (BCI 2019)
- Ontario Odonata Atlas (Jones et. al 2019)
- Ontario Reptile and Amphibian Atlas (iNaturalist 2019)
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Maps (DFO 2019)
- Information contained in natural heritage related map layers from Ontario Base Map series, Natural Resource Values Information System (NRVIS) mapping and Land Information Ontario (LIO 2019)
- City of Ottawa OP (Ottawa 2013)
- Existing high-resolution aerial photography

The MNRF was contacted by e-mail to obtain information on rare species, fish community data, and significant natural features in the study area in June 2016, with a response received in September 2016. Transfer of oversight of SAR was transferred to the Ministry of the Environment, Conservation and Parks (MECP) after the information request was completed and responded to. A formal information request was submitted to the City of Ottawa on July 15, 2016, with a response containing information pertaining to the physical features of the Site received on August 2, 2016.

4.2 SAR Screening

A SAR screening was conducted for the Site and focused on the review of records and range maps pertaining to species that are designated as threatened, endangered or special concern under the ESA, species that are listed as endangered or threatened under Schedule 1 of the SARA.

The potential for SAR to occur was assessed based on species range information, known records, review of the habitat observations made during the site investigations, historic land use practices, and the preferred habitat requirements of these species. Species with ranges overlapping the study area, or recent occurrence records in the vicinity, were screened by comparing their habitat requirements to habitat conditions in the study area.

The potential for the species to occur was determined through a probability of occurrence. A ranking of low indicates no suitable habitat availability for that species in the study area and no specimens identified, or no habitat present and a specimen observed incidentally. Moderate probability indicates more potential for the species to occur, as suitable habitat appeared to be present in the study area, but no occurrence of the species recorded, or a species was observed but no suitable habitat exists at the Site (e.g., fly-over). High potential indicates a known species record in the study area (including during site investigations or background data review) and good quality habitat is present. The rankings considered natural feature observations (i.e. habitat and species observations) made during the site investigations and background information obtained through the desktop review.

4.3 Site Investigations

The following sections outline the methods used for each of the site investigations conducted at the Site. Surveys were focused on the Site, and surrounding areas were reviewed to the extent possible from public areas such as roads. During all site investigations, visual encounter surveys (VES) were conducted and any additional wildlife, plant, and habitat observations were recorded. Searches were also conducted to document the presence or absence of suitable habitat, based on habitat preferences, for those species identified in the desktop SAR screening described above. The dates when all site investigations were conducted are included in Table 1.

Table 1: Summary of Natural Environment Site Investigations at the Site

Year	Date	Type of Survey
2015	August 3	Site reconnaissance
2016	April 27	Headwater Drainage Visit 1, Amphibian Habitat Assessment, Bat Habitat Assessment
	May 31	Breeding Birds, Plant Community, Aquatic Habitat, Bat Acoustic Detector Deployment, Headwater Drainage Visit 2
	June 14	Breeding Birds, Plant Community
	July 13	Plant Community, Retrieval of Bat Acoustic Detectors, Headwater Drainage Visit 3
	September 29	Tree Conservation Report investigations

Ecological Land Classification and Habitat Assessment

Plant communities were first delineated at a desktop level using aerial imagery and existing reports, then further assessed in the field using the Ecological Land Classification (ELC) system for Southern Ontario (Lee *et al.* 1998) (Figure 2). The surveys were carried out by systematically traversing the Site for a thorough survey of species and plant communities. During all site investigations, information on plant community structure and composition was recorded to refine the plant community polygons. Based on the ELC polygons, potential habitats for SAR were searched for and suitability was assessed.

Botanical Surveys

Botanical surveys were completed concurrent with ELC surveys and included area searches in all habitats on the Site. A list of all plant taxa identified during the surveys was compiled. Plants that were obviously planted for landscape purposes were not included in this inventory.

Efforts to locate butternut trees (*Juglans cinerea*) were concentrated in areas where development is proposed, and within 50 m of those areas. Searches for trees were conducted during all site investigations.

Breeding Bird Surveys

Breeding bird point count surveys were conducted at two stations for songbirds and other diurnal birds (Figure 2). Surveys followed protocols adapted from Atlas of the Breeding Birds of Ontario (Cadman *et al.* 2007). Point count stations were established on the Site, at least 250 m apart (Figure 2). Surveys were conducted in the period between 30 minutes before sunrise and 10:00 am to encompass the period of maximum bird song.

All birds seen or heard were noted and observations were made regarding sex, age, breeding evidence, and notable behaviour, when possible. Additional observations of birds in the study area were made during all other site investigations.

Herpetile Surveys

Amphibians

The Site was searched for suitable amphibian breeding habitat, and none was located. For this reason, no amphibian call-count surveys were performed.

Reptiles

VES for reptiles were conducted in all suitable habitats (e.g., under and within logs and other types of cover objects, etc.) following recommended protocols (MNR 2013b; McDiarmid 2012).

Mammal Surveys

Mammal surveys included track and sign surveys, as well as VES during all other site investigations, and generally followed recommended protocols (Bookhout 1994). Habitats on the Site were searched, with special attention paid to edge habitats and other areas where mammals might be most active. Areas of exposed substrate such as sand or mud were located and examined for any visible tracks. When encountered, tracks and other signs (e.g., tracks, scat, tree scrapes, etc.) were identified to species, if possible, and noted.

Bats

Daytime bat habitat surveys included a survey of each plant community searching for cavity trees with potential to support bat maternity roosts, and assessing the single residence on the Site to determine if it provides potential habitat. Areas with higher concentrations of cavity trees or foraging potential (such as wetlands) were targeted for acoustic surveys.

A stationary acoustic survey was performed to confirm the presence of any SAR bats, based on draft protocols prepared by the MNRF (undated). Frequent nightly passage by SAR bats would suggest that they are roosting within close proximity to the acoustic station. Bats will travel several kilometres in a night from their roost locations to feeding locations where they spend much of their time. Therefore, incidental recording of species does not necessarily indicate the presence of a maternity roost within the study area.

One full-spectrum bat detector (Wildlife Acoustics SM3BAT+®) was deployed on the Site (Figure 2). The detector recorded bat activity for a total of 14 nights (May 31 – June 13, 2016). The station was located in an area that provided coverage of the Site and targeted areas where bats would most likely be roosting, commuting or feeding. The U1 microphone was left open with no horn or windscreen for maximum recording capability. The detector was programmed to record from 30 minutes before sunset to 30 minutes after sunrise. The detector was triggered by ultrasound (which may or may not be a bat). Once triggered, it recorded a file between 5 and 15 seconds in duration and then started a new recording (if ultrasound persisted) or slept until it was next triggered.

The data was first filtered through Kaleidoscope software (Wildlife Acoustics) for signals between 15 and 120 kHz and then processed in Sonobat® and BatData (developed by Golder). The Sonobat program is specifically intended for discrimination of bats to the species level wherever possible, and validation of the species-level classification was conducted by Golder's bat acoustic specialist. The results of the species classification were tallied on a per-night basis for each station for each species or species group. Once automated classification was complete, a subset of the files (approximately 10%) were reviewed (QA/QC'd) by an experienced and qualified bat acoustic specialist. This QA/QC focused on files for which a species-level classification was made by Sonobat with particular attention to any files that could be a SAR.

Wildlife Visual Encounter Surveys

VES for all wildlife, including butterflies and dragonflies, were conducted throughout the study area, where access was available concurrent with all other site investigations. This included a search for tracks and other signs (e.g. scat, tree scrapes, predated turtle nests etc.). In addition, attention was paid to searching for suitable wildlife habitat and micro-habitats (e.g. hollow trees, talus, vernal pools, etc.). A list of all wildlife observations was compiled.

Aquatic Habitat and Fish

An aquatic habitat assessment was conducted at the northern watercourse, and at the small, linear drainage feature running north-south through the Site. Fish habitat mapping of all surface water features was also completed and included documentation of morphological features and representative photographs. Measurements such as wetted width, depth, presence of flow, substrate, instream cover, habitat structure and barriers to fish movement were noted. The habitat data collection methods Golder employed follows the Ministry of Transportation mapping guidelines (MTO 2009). No fish community surveys were undertaken, as the northern watercourse is connected to the Rideau River and therefore represents fish habitat. The linear drainage feature is disconnected from the northern watercourse by a precipitous drop down the valley banks, is typically dry, and so does not contain fish.

Golder completed a headwater drainage feature assessment (HDFA) to confirm the flow and connection of the linear drainage feature on the Site to complete the HDFA according to the Evaluation, Classification, and Management of Headwater Drainage Features Guidelines (the Guidelines) developed by the Toronto and Region Conservation Authority and Credit Valley Conservation (TRCA and CVC 2014). The assessment is based on data collected in the linear drainage feature according to Ontario Stream Assessment Protocol (OSAP) Section 4 Module 10 – Assessing Headwater Drainage Features (Gorenc and Stanfield March 2013).

4.4 Analysis of Significance and Sensitivity

An assessment was conducted to determine the significance and sensitivity of designated features as well as significant species observed in the study area or determined to have potential to exist in the study area as inferred from the SAR screening. The assessment was completed by comparing natural environment data collected through background material and site investigations to published resources as described in Section 4.1, and through a detailed analysis using the methods and criteria outlined in the Natural Heritage Reference Manual (NHRM) (MNR 2010), Significant Wildlife Habitat Technical Guide (SWHTG) (MNR 2000) and the Significant Wildlife Habitat Ecoregion Criterion Schedules (SWHECS) (MNR 2015).

5.0 SITE DESCRIPTION

5.1 Ecosystem Setting

The Site is located in the Lower Rideau River Subwatershed, and the Hogs Back Catchment Area (RVCA 2012). This catchment drains an area of 38 km² and is highly developed through residential and agricultural uses. Forest cover in this catchment is 13%.

5.2 Geology and Hydrogeology

The Site lies within the Clay Plains section of the Ottawa Valley Clay Plains physiographic region (Chapman and Putnam 1984), which is typically interrupted by ridges of rock or sand. The subsurface conditions on the Site generally consist of topsoil and/or sandy silt underlain by a deposit of marine silty clay (Golder 2020a). The groundwater levels at the Site were measured at about 2.94 to 5.74 m depth (Golder 2020a); however, there could be higher groundwater levels during wet periods of the year.

5.3 Ecological Land Classification

5.3.1 Plant Communities

Five plant communities were delineated on the Site during the ELC surveys. These communities are shown on Figure 2 and described in Table 2. All of the plant communities on the Site are typical in the region and for the conditions on the Site, and none have been assigned provincial rarity ranks (SRANK) in the NHIC database.

Table 2: Plant Communities on the Site

Plant Community Type	Description
AGRC – Agricultural Row Crop	This community was an agricultural field that was planted in corn in 2016. This field was plowed during the early summer of 2016 for archeological work, which led to a rapid growth of agricultural weeds such as charlock (<i>Sinapis arvensis</i>), and annual blue-grass (<i>Poa annua</i>) later in the summer.
DH – Deciduous Hedgerow	This community included hedgerows in and around the agricultural field. There was a mix of trees and shrubs including silver maple (<i>Acer saccharinum</i>), Manitoba maple (<i>Acer negundo</i>), common buckthorn (<i>Rhamnus cathartica</i>), and red raspberry (<i>Rhus typhina</i>). Overall the trees were immature, lacking cavities, and the shrubs are dense in places. There were also small patches of meadow plants such as Canada goldenrod and asters (<i>Symphyotrichum</i> spp.) throughout.
FOD 5-6 Dry to Fresh Sugar Maple – Basswood Deciduous Forest	This community was the dominant portion of a small woodlot at the northern edge of the Site, and contiguous off Site. Sugar maple (<i>Acer saccharum</i>) was dominant in the canopy, with several associates such as basswood (<i>Tilia americana</i>). Closer to the edge of the forest, sugar maple became less dominant. The canopy was primarily closed, and the understory and ground cover was sparse with plants such as zig-zag goldenrod (<i>Solidago flexicaulis</i>), and maple-leaved viburnum (<i>Viburnum acerifolium</i>). Although the forest was immature overall, there were several individual mature trees throughout. Many of these trees appeared to have visible cavities. There was a steep valley within this forest that sloped down to the northern watercourse. Downed woody debris and snags were moderate.
FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest	This small community was within the FOD 5-6 but at the base of the valley in the floodplain of the small stream. Green ash (<i>Fraxinus pennsylvanica</i>) was dominant in the canopy with associates such as white elm (<i>Ulmus americana</i>). The canopy was primarily semi-open, with a sparse understory but dense groundcover dominated by species such as sensitive fern (<i>Onoclea sensibilis</i>) and spotted touch-me-not (<i>Impatiens capensis</i>). Although the soil was moist, it does not appear to flood every year, and was not under suitable saturated conditions to be considered a wetland. Overall the stand was immature with the occasional larger potential cavity tree. Snags and downed woody debris were occasional.
RES Residential – Parkland	This included a small portion of a residential property on Site, as well as additional residential properties and parks in the larger study area.

5.3.2 Vascular Plants

A total of 91 vascular plant taxa were noted during site investigations (Appendix C). Generally, there was a mix of native and alien species in all plant communities, with native species being more abundant in the deciduous forests.

No SAR, provincially rare, or regionally significant plants were observed on the Site.

5.4 Wildlife

A list of wildlife species identified on the Site is provided in Appendix D.

5.4.1 Butterflies and Dragonflies

Nineteen species of butterflies and dragonflies were identified on the Site (Appendix D). Although no individual monarchs (*Danaus plexippus*) were observed, their food plants common milkweed (*Asclepius syriaca*) were observed throughout the Site. For a discussion of monarch on the Site refer to Section 6.7.4.

5.4.2 Herpetofauna

Two individuals of two herpetile species were observed on the Site: American toad (*Bufo americanus*), and northern leopard frog (*Rana pipiens*). There is no suitable amphibian breeding habitat on the Site. No SAR, provincially rare, or regionally significant herpetiles were observed on the Site.

5.4.3 Birds

Twenty-nine bird species were observed during site investigations (Appendix D). The majority of these were recorded during the breeding bird point count surveys. The most abundant birds included those that are common at field edges and forested areas such as song sparrow (*Melospiza melodia*) and red-eyed vireo (*Vireo olivaceus*). Eastern wood-pewee (*Contopus virens*), was observed in the forest at the northern edge of the Site. This species is designated as special concern under the ESA. For a discussion of eastern wood-pewee on the Site refer to Section 6.7.4. No threatened or endangered birds were observed at the Site.

5.4.4 Mammals

Eleven mammal species were identified on the Site (Appendix D). This included species such as white-tailed deer (*Odocoileus virginianus*) and grey squirrel (*Sciurus carolinensis*), and four bat species. The only provincially rare or SAR mammals observed was little brown myotis (*Myotis lucifugus*) designated as endangered under the ESA and SARA. This species is discussed further in Section 6.1.

5.5 Fish and Fish Habitat

5.5.1 Rideau River

The Rideau River is located approximately 110 metres west of the Site. According to the RVCA (2012), this section of the river is known to support a warm/cool water recreational and baitfish fishery with over forty species documented, and has a water quality rating of 'fair'. The east bank of the Rideau River in proximity to the Site is occupied by the RCMP campsite.

5.5.2 Northern Watercourse

There is a permanent unnamed watercourse in the forest immediately north of the Site (the northern watercourse; Figure 2). This watercourse is within a relatively steep valley and flows into the Rideau River, northwest of the Site. During surveys in May 2016, low to moderate flow was observed. The stream had a wetted width of 0.5 to 1 m, bankfull width of 3-5 m, and a depth that ranged from 1 to 10 centimetres. The reach of this stream that was surveyed included a combination of runs, riffles and very small pools. Substrate was 60% fines, 20% gravel, 10% cobbles, and 10% organic material, and instream vegetation was not observed. Riparian vegetation was also lacking with the exception of the canopy and sub-canopy trees. The partially closed canopy of the forest provides heavy shade on this stream. During the July 2016 survey, water levels and flow were very low within this stream, although a trickle flow was still apparent. It is worth noting that the region was undergoing drought conditions at the time, and it is likely 2016 does not represent a year of typical conditions. Although no fish were observed, it is likely that this stream is fish habitat due to its direct connection to the Rideau River.

5.5.3 Linear Drainage Feature

There is an agricultural drainage ditch in the middle of the Site. This feature appears to have been constructed to allow drainage within the row crop field. It starts at the southern edge of the center hedgerow, and runs northward and then down into the valley (Figure 2). This feature was dry during all visits, including April 2016. The channel width was relatively consistent at one metre, and the channel depth was 10-20 centimetres. It was primarily shaded by trees and shrubs within the hedgerow and contains terrestrial grasses and forbs within the channel itself. Its connection to the northern watercourse down a very steep incline that would make movement of fish into the feature from the northern watercourse impossible, even during high water events. Therefore, this feature is not considered fish habitat.

5.5.4 Evaluation and Classification of Headwater Drainage Feature

Based on Golder's observations in 2015 and 2016, the northern watercourse appears to be a permanently flowing watercourse, and so does not qualify as a headwater drainage feature per the definition provided in the HDF Guidelines (TRCA/CVC 2014). The linear drainage feature was assessed according to the 'Standard' level protocols provided in the HDF Guidelines; however, the feature was dry during all site investigations in 2015 and 2016. Given that the linear drainage feature is disconnected from the northern watercourse by steep banks, constituting a barrier to fish movement, no fish community sampling was deemed necessary at this feature. Conference with the RVCA (pers. correspondence with Jen Lamoreaux, November 21, 2016) confirms that the level of assessment performed on this feature is appropriate, given its characteristics. Below is a discussion outlining the outcome of the evaluation of the linear drainage feature against the criteria provided in the HDF Guidelines.

Step 1 – Hydrology Classification

The linear drainage feature was seen to be dry during all site investigations in 2015 and 2016. Despite this, investigations revealed physical evidence of flow where the feature meets the valley to the north (erosion, sediment sorting, etc.). Based on observations, the feature is given a Feature Type Code of 2, and a Flow Condition Code of 1, resulting in a "C" classification (Contributing) for hydrology based on the HDF Guidelines.

Step 2 – Riparian Classification

The ELC community in which the linear drainage feature is located is cropped lands (agriculture), with a very narrow band of shrubs and trees along the feature, resulting in a Riparian Vegetation Code of 3, resulting in a "D" classification (Limited) for Riparian Conditions based on the HDF Guidelines.

Step 3 – Fish and Fish Habitat Classification

The linear drainage feature was dry during all site investigations in 2015 and 2016, and is disconnected from the northern watercourse by the precipitous valley slopes. This feature does not provide any direct fish habitat, resulting in a "C" classification (Contributing) for Fish and Fish Habitat based on the HDF Guidelines.

Step 4 – Terrestrial Habitat Classification

The ELC community in which the linear drainage feature is located is cropped lands (agriculture), with a very narrow band of shrubs and trees along the feature, resulting in a Riparian Vegetation Code of 3, and no amphibian habitat was observed within the features. Based on this, the feature receives a "D" classification (Limited) for Terrestrial Habitat based on the HDF Guidelines.

Summary of Classifications

The summary of the classifications described above is provided in Table 3. The flowchart (Figure 2 in the HDF Guidelines) was used to determine the overall management recommendation.

Table 3: Summary of Functional Classifications and Management

Drainage Feature	Step 1		Step 2	Step 3	Step 4	Management Recommendation
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial Habitat	
Linear Drainage Feature	C - Contributing	None	D - Limited	C - Contributing	D - Limited	Mitigation

The main implications of applying the mitigation recommendation as outlined in the HDF Guideline are as follows:

- replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales to mimic online wet vegetation pockets, or replicate through constructed wetland features connected to downstream
- replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales, etc.
- replicate functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options

Mitigation measures being implemented in the design plan to replicate the functions and flows of the linear drainage feature are discussed in Section 5.8.

5.6 Habitat of Endangered or Threatened Species

The following discussion of provincially endangered or threatened species is based on the SAR screening provided in Appendix B. Species with a low probability to occur in the study area are included in the screening, but are not discussed further in this report. Each of the species listed below has the potential to inhabit the study area, based on the desktop SAR screening and the results of the site investigations.

Little Brown Myotis

Little brown myotis (*Myotis lucifugus*) is designated as endangered under the ESA and SARA and is therefore provided species and habitat protection. The residence on the Site was not assessed as having potential to provide habitat for bats, based on it being well-maintained. The Site contains large cavity trees that may provide suitable maternity roost habitat for this species, and the overall Site provides suitable foraging habitat. The large cavity trees were observed only in the forest community at the north edge of the Site, associated with the valley and northern watercourse. There are no potential hibernacula on the Site, in the form of either natural or anthropogenic structures, as these species typically over-winter in caves or mines.

A targeted survey for SAR bats was completed during the appropriate timing windows in 2016. During these surveys, little brown bat was the only SAR bat recorded at the Site. Over the course of the 14 night survey, this species was recorded on only two nights, and at low levels (7 passes on May 31, and 11 passes on June 3). The number of recorded passes cannot be directly correlated to number of individuals, as a single bat may pass a detector multiple times during the course of their evening foraging activity. Given that this species was not recorded on all or most evenings, it is not likely that it is using the Site for maternity roosting, but rather is foraging

at the Site occasionally. Regardless, the forested habitats and a portion of the tablelands lie outside of the proposed development. Habitat for this species, if present in the study area, will not be negatively impacted by the proposed development.

5.7 Significant Wetlands and Coastal Wetlands

Wetlands are evaluated by the MNRF according to evaluation procedures established by the province, specifically, the Ontario Wetland Evaluation System (MNRF, 2014a). Through this evaluation, wetlands are designated either provincially significant (PSW) or non-provincially significant (non-PSW). Coastal wetlands are located on the shores of the Great Lakes, or their connecting channels. No provincially significant wetlands or coastal wetlands are identified in the study area.

5.8 Fish Habitat

Projects affecting waterbodies supporting Canada's CRA fisheries must comply with the provisions of the *Fisheries Act*. To assess the implications of the *Fisheries Act*, fish habitat impacts are described in terms of direct, on-site habitat and indirect, off-site effects of the proposed project.

The Rideau River and the northern watercourse are considered fish habitat. These features will not be directly impacted by the proposed development as setbacks will be applied to them as part of the proposed development (Figure 4). The setback to the Rideau River provided in the proposed development is a minimum 15 m from the top of slope along the western edge of the Site. The setback to the northern watercourse is a minimum of 15 m except for minor intrusion in a few locations (Lots 2-4, 6-8 and 20). These setbacks are based on City of Ottawa policies, supported by a slope stability assessment performed by Golder (2020a) that determined the Limit of Hazard Lands (i.e., geotechnical setback) is 15 m from the top of slope along the northern slopes, and 8 m from the top of slope along the western slopes (Figure 4). The setback areas will be improved from their current condition (active agriculture and lawn) through naturalized plantings, and may accommodate a future multi-use pathway planned by the City. The proposed setbacks are sufficient to protect the fish habitat in these surface water features.

Indirect impacts to the fish habitat may result from changes to water quality and quantity entering the Rideau River from the stormwater management system that is proposed to serve the Site. Stormwater from the Site will be handled off-site, and will eventually outlet to the Rideau River. As noted in Section 3.0, water quality and quantity control will be handled off-Site prior to release to the Rideau River, therefore no impacts to fish habitat in the Rideau River are anticipated. Indirect impacts to fish habitat in the northern watercourse could result from removal of flows currently provided by the linear drainage feature (proposed for in-filling). To eliminate these impacts, and to comply with the recommendations of the HDF Guidelines (i.e., replication of the functions and flows this feature represents), the implementation of stormwater BMPs and LIDs are proposed, as discussed in Section 3.0, including rear yard drainage along the northern edge of the Site being directed into the setback to the northern watercourse, which will provide continued surface water inputs to this feature. This approach is consistent with the recommended strategy presented in the Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (Stantec 2017), which recommends that “baseflow to the ravines must be maintained in order to preserve the natural function of these ravines. Subdivision designs for the proposed development areas will be required to implement measures to maintain ravine baseflows. The RVCA has indicated that a solution that utilizes foundation drains, or rear-yard drainage or LIDs and conveys flows subsurface for cooling is preferred.” The removal of the linear drainage feature will require approval and permits from the RVCA.

Based on the groundwater levels measured at the Site (Golder 2020a), excavations deeper than about 2.9 to 5.7 m may extend below the groundwater level. Groundwater inflow into the excavations should feasibly be handled by pumping from well filtered sumps established in the floor of the excavations. Groundwater inflow from the silty clay is expected to be low to moderate; however, the actual rate of groundwater inflow will depend on many factors including the contractor's schedule and rate of excavation, the size of the excavation, the number of working areas being excavated at one time, and the time of year at which the excavation is made (Golder 2020c). Also, there may be instances where significant volumes of precipitation, surface runoff and/or groundwater collects in an open excavation, and must be pumped out (Golder 2020c). Measures to protect the northern watercourse from impacts from pumping are described in Section 8.0.

Based on the groundwater information collected at the Site (Golder 2020a), it is unlikely that a Permit To Take Water (PTTW) will be required during construction; however, registration on the Environmental Activity and Sector Registry (EASR) may be required.

Based on Golder (2020c), no impacts to groundwater levels, or water levels or water quality in the adjacent northern watercourse are expected to result from the proposed development.

5.9 Significant Woodlands

Significant woodlands are to be defined and designated by the local planning authority (MNRF 2010). According to the PPS, significant woodlands are to be identified using criteria established by the MNRF in the Natural Heritage Reference Manual (NHRM) for Policy 2.3 of the PPS (MNRF 2010). The City has updated their OP policies as they relate to determining woodland significance in the Urban Area to be in conformity with the direction given in the PPS. The revised policies indicate that woodlands within the Urban Area are significant if:

- they are 0.8 ha in size or larger
- they are 40 years of age or older at the time of evaluation

These policies are not applicable in Urban Areas where there is an existing or advanced Secondary Plan, Community Design Plan, Concept Plans or equivalents. The Site lies within the area covered under the Riverside South CDP, and as such, these policies do not apply.

The CDP does not specifically identify significant woodlands, but does identify the forested areas at the northern limit of the Site as Open Space. The proposed development will not encroach into this feature, and the current adjacent land use will change from active agriculture and lawn to naturalized setback area as part of the proposed setback that is generally a minimum of 15 m from the top of slope. Rear yards backing onto the feature will be fenced. As a result, no negative impacts to this woodland are anticipated to result from the proposed development.

5.10 Significant Valleylands

Recommended criteria for designating significant valleylands under the PPS include prominence as a distinctive landform, degree of naturalness, importance of its ecological functions, restoration potential, and historical and cultural values. The City of Ottawa OP has not identified any unstable slopes at the Site (Schedule K); however, the Characterization of Ottawa's Watersheds (Ottawa 2011) shows slopes >15% associated with the northern watercourse. Section 2.4.2 of the OP identifies significant valleylands as areas with slopes greater than 15% and a slope length of more than 50 m. The valley feature at the north edge of the Site exhibits steep slopes (near vertical in places), is over 50 m in length, and is therefore considered significant.

According to Section 4.7.3 of the OP, developments located adjacent to surface water features are subject to setback requirements as laid out in the applicable watershed, subwatershed or environmental management plans. In the absence of such plans, minimum setbacks are prescribed in the OP (Section 4.7.3, Policy 2), which are the greater of:

- Development limits as established by the regulatory flood line;
- Development limits as established by the geotechnical limit of the hazard lands;
- 30 m from the normal high-water mark of rivers, lakes and streams, as determined in consultation with the conservation authority; or,
- 15 m from the existing top of bank, where there is a defined bank.

Based on a slope stability assessment performed by Golder (2020a), it was determined that the Limit of Hazard Lands (i.e., geotechnical setback) does not extend beyond the proposed 15 m setback from the top of slope. This will protect the banks from erosion, and therefore no associated impacts to the valley feature are anticipated. No development is planned within this area, except for a future multi-use pathway planned by the City, and limited intrusion associated with a small area of filling (Lots 6-8) as well as at Lots 2-4 and 20. This setback is in compliance with the various setbacks listed under Section 4.7.3 (Policy 2) of the OP (bullet list above), and therefore the proposed setbacks meet the requirements of the OP. As such, no impacts to the significant valley are anticipated to result from the proposed development. General mitigation measures to protect the slope during construction are discussed in Section 8.0.

5.11 Significant Areas of Natural or Scientific Interest (ANSIs)

ANSIs are areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. The MNRF is responsible for identifying ANSIs. No ANSI are identified in the study area.

5.12 Significant Wildlife Habitat

The Natural Heritage Reference Manual (MNRF 2010) includes criteria and guidelines for designating significant wildlife habitat (SWH). There are two other documents, the SWHTG and the SWHECS, which provide specific values and criteria for identifying SWH and offer some general information and ideas regarding the consideration of thresholds for the definition of significance. The Significant Wildlife Habitat Mitigation Support Tool (SWHMiST; MNRF 2014b) is also used in conjunction with the SWHECS to determine appropriate mitigation for disturbance or removal of SWH.

There are four general types of significant wildlife habitat: migration corridors, seasonal concentration areas, rare or specialized habitats, and species of conservation concern. Each of these types of significant wildlife habitat is discussed below in relation to the study area.

5.12.1 Migration Corridors

The SWHTG defines animal movement corridors as elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another. This is generally in response to different seasonal habitat requirements. For example, trails used by deer to move to wintering areas or areas used by amphibians between breeding and summer habitat. To qualify as significant wildlife habitat, these corridors would be a critical link between habitats that are regularly used by wildlife.

While the forested area associated with the northern watercourse may provide some linkage function, the area is not considered significant for the purposes of this report as the linkage ends at the heavily travelled River Road and does not connect habitat patches. The forested area is shown as a Contributing Linkage in the City of Ottawa Greenspace Masterplan (Ottawa 2006), as it may contribute to the linkage function of the Rideau River corridor. The proposed development will not encroach into this feature, and the current adjacent land use will change from active agriculture and lawn to naturalized setback area as part of the 15 m top of slope setback. As a result, no negative impacts to any linkage function of this area are anticipated to result from the proposed development.

5.12.2 Seasonal Concentration Areas

Seasonal concentration areas are those areas where large numbers of a species congregate at one particular time of the year. Examples include deer yards, amphibian breeding habitat, bird nesting colonies, bat hibernacula, raptor roosts, and passerine migration concentrations. If a species is at risk, or if a large proportion of the population may be lost if significant portions of the habitat are altered, all examples of certain seasonal concentration areas may be designated.

The SWHTG identifies the following 14 types of seasonal concentrations of animals that may be considered significant wildlife habitat, and along with the SWHECS outlines means of identifying such habitat. They are:

- winter deer yards
- moose late winter habitat
- colonial bird nesting sites
- waterfowl stopover and staging areas (aquatic and/or terrestrial)
- waterfowl nesting areas
- shorebird migratory stopover areas
- landbird migratory stopover areas
- raptor winter feeding and roosting areas
- wild turkey winter range
- turkey vulture summer roosting areas
- reptile hibernacula (and turtle wintering areas)
- bat hibernacula
- bullfrog concentration areas
- migratory butterfly stopover areas

In addition to the above list, the SWHECS considers bat maternity colonies and bat migratory stopover areas as seasonal concentration areas for wildlife.

Deer and moose management is an MNRF responsibility, and deer winter congregation areas considered significant are mapped by the MNRF. There are no deer yards identified on the Site or in the study area, nor is there any identified moose late winter habitat.

No evidence of colonial bird nesting was observed within the steep banks associated with the Site or in the study area, and there are no cliffs, rocky islands or peninsulas suitable for colonial bird nesting habitat. Further, no heronries were identified during the site investigations.

No areas suitable for supporting waterfowl during migration times (stopover and staging) were identified during site investigations. No terrestrial stopover or staging habitat was observed on the Site or in the study area, nor was any evidence of waterfowl nesting observed during the site investigations.

Shorebird stopover sites are typically well-known and have a long history of use. The Site and study area do not have areas of suitable shorebird foraging habitat. In addition, no concentrations of shorebirds or presence of the listed species was identified through background review or during the site investigations.

The study area is not located in close enough proximity (i.e., within 5 kilometres) to the Great Lakes to provide suitable landbird migratory stopover areas.

Ideal raptor winter roosting areas are generally located in mature mixed or coniferous woodlands that abut windswept fields that do not get covered by deep snow. There are no suitable areas on the Site or in the study area for raptor winter feeding and roosting.

Suitable habitat for wild turkey includes a mix of forest and open land such as natural grassland or agriculture. For wintering, wild turkeys tend to prefer large dense coniferous forests adjacent to open land and close to both a food source and groundwater seeps. While wild turkey have been observed using the Site, there are no large dense coniferous forests on the Site or in the study area.

No significant turkey vulture summer roosting habitat was observed on the Site or in the study area.

Reptile hibernacula and active reptiles were searched for during site investigations in the study area. While the forested area may provide snake hibernacula for individual snakes in the form of mammal burrows, no evidence of use of the Site or study area for hibernacula was observed during site investigations, and the only portions of the Site with potential for this (i.e., the valley associated with the northern watercourse) will not be impacted by the project footprint.

There is no standing water suitable for turtle over-wintering habitat on the Site. The Rideau River, located approximately 110 m west of the Site, is the nearest suitable habitat of this type.

There are no suitable areas of bat hibernacula at the Site or in the study area, and no karst topography or features are known to occur at the Site or immediate vicinity (OMNDM 2018). Based on site investigations, no portions of the Site or study area provide the necessary number (>10/ha) of large (>25cm DBH) wildlife trees to be considered significant maternity roost habitat; however, some individual wildlife trees were identified scattered throughout forested area, primarily north of the Site. No bat migratory stopover areas are identified in this eco-region.

The Site does not provide suitable large open water areas for bullfrog. The Rideau River, located approximately 110 m west of the Site, is the nearest suitable habitat of this type.

The study area is not located within 5 km of Lake Ontario, and therefore does not meet the criteria for significant migratory butterfly stopover habitat.

5.12.3 Rare or Specialized Habitats

Rare Habitats

Rare habitats are those with plant communities that are considered rare in the province, such as sand barrens, alvars, old growth forests, savannah and tallgrass prairie. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant. Generally, communities assigned an SRANK of S1 to S3 (extremely rare to rare-uncommon) by the NHIC qualify as rare.

None of the plant communities identified in the study area are ranked S1 to S3 by the NHIC.

Specialized Habitats

Specialized habitats are microhabitats that provide a critical resource to some groups of wildlife. The SWHTG defines 14 specialized habitats that may be considered significant wildlife habitat, and outlines means of identifying such habitats. They are:

- habitat for area-sensitive species
- forests providing a high diversity of habitats
- old-growth or mature forest stands
- foraging areas with abundant mast
- amphibian woodland breeding ponds
- turtle nesting habitat
- specialized raptor nesting habitat
- moose calving areas
- moose aquatic feeding areas
- mineral licks
- mink, otter, marten, and fisher denning sites
- highly diverse areas
- cliffs
- seeps and springs

In addition to the above list, the SWHECS considers waterfowl nesting habitat, bald eagle and osprey nesting, foraging and perching habitat, woodland raptor nesting habitat, and amphibian wetland (i.e., non-woodland) breeding habitat as specialized habitat for wildlife. Waterfowl nesting was discussed under Section 6.7.2 (Seasonal Concentration Areas).

The forested area at the north edge of the Site is not large enough to provide habitat for area-sensitive breeding birds according to the definition provided in the SWHECS (i.e., 200 m from the forest edge).

The forested area at the north edge of the Site does not provide a high diversity of habitats, old-growth characteristics, or foraging areas with abundant mast.

The Site does not meet the criteria for significant amphibian breeding habitat (woodlands or wetlands), as no suitable amphibian breeding habitat was observed. Individual amphibians were observed during daytime site investigations.

The SWHECS indicates that exposed mineral soils in open sunny areas must be present to support turtle nesting. The Site consists mainly of active agricultural lands, and so these areas would provide exposed soils during spring, prior to crops sprouting; however, the area is not adjacent to wetlands suitable for supporting turtle species. The closest turtle habitat is within the Rideau River, approximately 110 m west of the Site, and separated from the Site by steep slopes.

Nesting habitat for raptors, as well as perching and foraging habitat for bald eagle and osprey, were not identified as no raptors or raptor nests were observed during site investigations. Further, to meet the SWHECS criteria for this habitat type, there must be > 10 ha of interior forest habitat (measured 200 m from any edge) present. This is not present on the Site or in the study area.

No moose calving or aquatic feeding areas, mineral licks, or mink, otter, marten or fisher denning sites were observed during site investigations.

Highly diverse areas are described in the SWHTG as areas with a high species or plant community diversity. The Site and study area is primarily active agriculture, and so does not meet this criteria.

There is no cliff / talus habitat on the Site or in the study area, according to the criteria presented in the SWHECS.

No evidence of groundwater seepage or springs were observed on the Site or in the study area.

5.12.4 Habitat for Species of Conservation Concern

Habitat for Species of Conservation Concern (SOCC) includes four types of species: those that are rare, those whose populations are significantly declining, those that have been identified as being at risk to certain common activities, and those with relatively large populations in Ontario compared to the rest of the world.

Rare species are considered at five levels: globally rare, nationally rare, provincially rare, regionally rare; and locally rare (in the local planning authority). This is also the order of priority that should be attached to the importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to forest fragmentation and species such as woodland raptors that may be vulnerable to forest management or human disturbance. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

Through the desktop SAR screening and site investigations, two species of conservation concern were identified as having potential to occur at the Site and in the study area: monarch (*Danaus plexippus*) and eastern wood-pewee (*Contopus virens*) (both considered special concern under the ESA and SARA). Habitat for monarch is present through the Site wherever flowering plants are present, and this species may also roost in the forested area at the north edge of the Site. Habitat for eastern wood-pewee is located within the forested area at the north edge of the Site, where this species was observed. As these habitats are being maintained and enhanced, no negative impacts to these species are expected to result from the proposed development.

The SWHECS also considers shrub/early successional breeding bird habitat, open country breeding bird habitat, marsh breeding bird habitat, and presence of terrestrial crayfish as habitat for SOCC. Based on site investigations, the vegetation communities that provide shrub/early successional, open country or marsh breeding bird habitats are not present on the Site, nor were any species with a preference for these habitats observed during targeted surveys. No evidence of terrestrial crayfish was observed during site investigations.

6.0 POTENTIAL INDIRECT IMPACTS

6.1 Construction Impacts

Impacts of the construction activities on the Site have the potential to negatively affect the natural features in the study area, including loss of overall biodiversity on the Site through removal of vegetation and wildlife habitat.

Activities related to Site preparation and development such as grading, filling, and presence of heavy machinery can cause soil erosion and compaction, while machinery can destroy over-hanging vegetation. Encroachment into the natural areas can also occur by machinery, foot traffic, and discarding or storage of construction materials outside the development envelope. Standard construction best management practices will be employed to protect the adjacent natural features during construction, as outlined in Section 8.0.

Generally, construction noise represents a short-term disturbance to wildlife using the adjacent natural areas. It is expected that with the completion of construction, wildlife will quickly return to their normal use patterns within the natural areas adjacent to the development. Temporary and short-term loss of biodiversity at the Site due to construction (i.e., site clearing) will be mitigated through ensuring the setbacks are naturalized from their current agricultural state.

6.2 Human Impacts

Many of the chronic impacts that can occur in urban natural areas are not a result of degradation of the edge, but a dramatic increase in human use through the entire system. The residential development may result in a marginal increase in potential disturbance to the adjacent natural features through the following potential impacts:

- light pollution
- increased noise
- introduction of exotic species
- increased human influence (ad-hoc trails, dumping, edge encroachment)
- mortality of wildlife from loose pets

Given the agricultural nature of the Site in its current condition, and the surrounding rural residential uses, many, if not all, of the above potential impacts are already present at the Site to some degree. The proposed setback from the top of slope and rear yard fencing will help to alleviate some of these issues. Further mitigation of these potential impacts is discussed in Section 8.0.

7.0 MITIGATION AND MONITORING

7.1 Significant Natural Features

The primary form of mitigation proposed as part of the preliminary design is avoidance of significant natural features and implementing setbacks to those features. Significant natural features identified as present, or potentially present at the Site, include:

- potential habitat for endangered species
- fish habitat
- significant valleylands
- habitat for species of conservation concern

All of the significant natural features and functions identified as present or potentially present on the Site and in the study area are located outside of the proposed development. On the Site, all of the significant natural features are contained within the forested area at the north edge of the Site. This area will be protected by a minimum 15 m setback to the top of slope (with the exception Lots 2-4, 6-8 and 20), with the existing agricultural fields and lawn within that area proposed for naturalization. This, in combination with the proposed stormwater management plan, is anticipated to protect the identified significant natural features at the Site.

Best practices for working near water (DFO 2016) should be incorporated into the construction plan, including but not limited to:

- Clean machinery prior to arrival on-Site and keep it maintained free of fluid leaks, invasive species and noxious weeds.
- Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering a waterbody.
- Install effective erosion and sediment control measures before starting work to prevent sediment from entering a waterbody.
- Implement measures for managing water flowing onto the Site, as well as water being pumped/diverted from the Site such that sediment is filtered out prior to the water entering a waterbody.
- Regular inspect and maintain erosion and sediment control measures and structures during the course of construction, and repairs as necessary.

Post-construction, stormwater from the Site will be treated off-Site to provide water quality and quantity control. Additional construction best management practices are outlined in Section 8.2.

7.2 Construction Best Management Practices

Standard best management practices to be followed during construction to mitigate damage or indirect effects to the adjacent natural features include the following:

- The development envelope be clearly demarcated and maintained.
- No removal of vegetation during the active season for breeding birds (April 1 – August 15), unless construction disturbance is preceded by a nesting survey conducted by a qualified biologist.

- Wildlife should be allowed the opportunity to leave the construction area safely by ensuring gaps in construction boundary fencing are maintained until vegetation clearing is complete.
- No storing or disposal of materials outside of the construction envelope.
- Implement standard construction BMP, including sediment and erosion controls, spill prevention and response plan, etc., during the construction phase of the project.
- Implement standard best management practices to mitigate noise and dust on the Site during the construction phase of the project.
- To protect vegetation being retained, follow the recommendations of the TCR (Golder 2020b).

7.3 Human Impacts

Potential human impacts to the adjacent natural features can be mitigated through the following:

- Prepare a landscaping plan for the project that incorporates use of native, non-invasive species.
- Fence rear yards backing onto natural areas to reduce encroachment into the natural areas.
- Avoid direct glare beyond the property boundaries that abut natural features by installing low intensity and downward pointing lights.
- Turn off outdoor lighting when not in use, except where used for security and safety.
- Consider the use of motion sensors on all safety and security lighting.

The key measure employed in the proposed development to mitigate for these potential effects is the implementation of setbacks from the significant natural features (top of slope). The development has been planned to leave large areas of natural vegetation intact and un-fragmented by concentrating development in the agricultural areas of the Site and proposing to naturalize the setback areas from their current agricultural state.

7.4 Monitoring

Monitoring programs are developed to assess the effectiveness of mitigation measures implemented at a project location. The key mitigation measure employed in this proposed development is avoidance of the adjacent significant natural features and their functions; therefore, monitoring of the Site specific to the natural environment is not proposed.

8.0 CUMULATIVE EFFECTS

Cumulative effects assessment considers the potential for additive impacts to the local landscape due to existing and future development. The proposed development is an intensification of use on an agricultural property, within an urbanizing context. The Community Design Plan (Ottawa 2016) for the area has identified this Site, as well as neighbouring lands, for residential development. Based on this, and the fact that there are no anticipated impacts to the natural environment, no cumulative effects have been identified that would require mitigation on the Site.

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 Net Impacts

Significant natural features identified as present, or potentially present, on the Site include: potential habitat for endangered species, fish habitat, significant valleylands, and habitat for SOCC. These features on the Site will be maintained and enhanced, resulting in no net negative impacts.

9.2 Policy Compliance

The proposed development complies with the natural heritage policies of the Provincial Policy Statement. In addition, there will be no negative effects on the significant natural features associated with the Site, which satisfies the policies under Section 2.4.2 of the Official Plan.

The proposed watercourse setbacks are in compliance with Section 4.7.3 of the OP.

9.3 Recommendations

No negative impacts on the natural environment are expected to result from the proposed development. This conclusion is based on the following recommendations:

- The development envelope shown in the design plan (Novatech 2020) be maintained.
- The principles and general approach to stormwater management discussed in Stantec (2016; 2017) be adhered to.
- No removal of vegetation during the active season for breeding birds (April 1 – August 15).
- The City of Ottawa Protocol for Wildlife Protection during Construction (Ottawa 2015b) be adhered to.
- All buffer areas as shown on the design plan are established, protected and enhanced.
- All monitoring requirements identified as part of permits or approvals for the project are adhered to.
- Best management practices, including sediment and erosion controls, spill prevention, etc., are implemented during the construction phase of the project, as outlined in Section 8.0.

10.0 LIMITATIONS AND USE OF REPORT

This report was prepared for Nicholls Island Holdings Inc. The report, which specifically includes all tables, figures and appendices, is based on data and information collected by Golder, and reflects the conditions within the study area at the time of the site investigations, supplemented by data obtained by Golder from external sources as described in this report. Golder has exercised reasonable skill, care and diligence to assess the external data acquired during the preparation of this assessment, but makes no guarantees or warranties as to the accuracy, currency or completeness of this information. This report is based upon and limited by circumstances and conditions acknowledged herein, and upon information available at the time of authoring.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

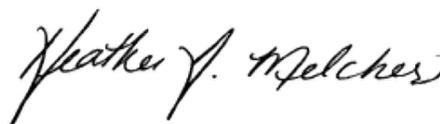
11.0 CLOSURE

We trust this report meets your current requirements. If you have any questions regarding this report, please contact the undersigned.

Golder Associates Ltd.



Gwendolyn Weeks, H.B.Sc.(env)
Ecologist / Project Manager



Heather Melcher, M.Sc.
Senior Ecologist / Principal

GAW/HM/PAS/sg

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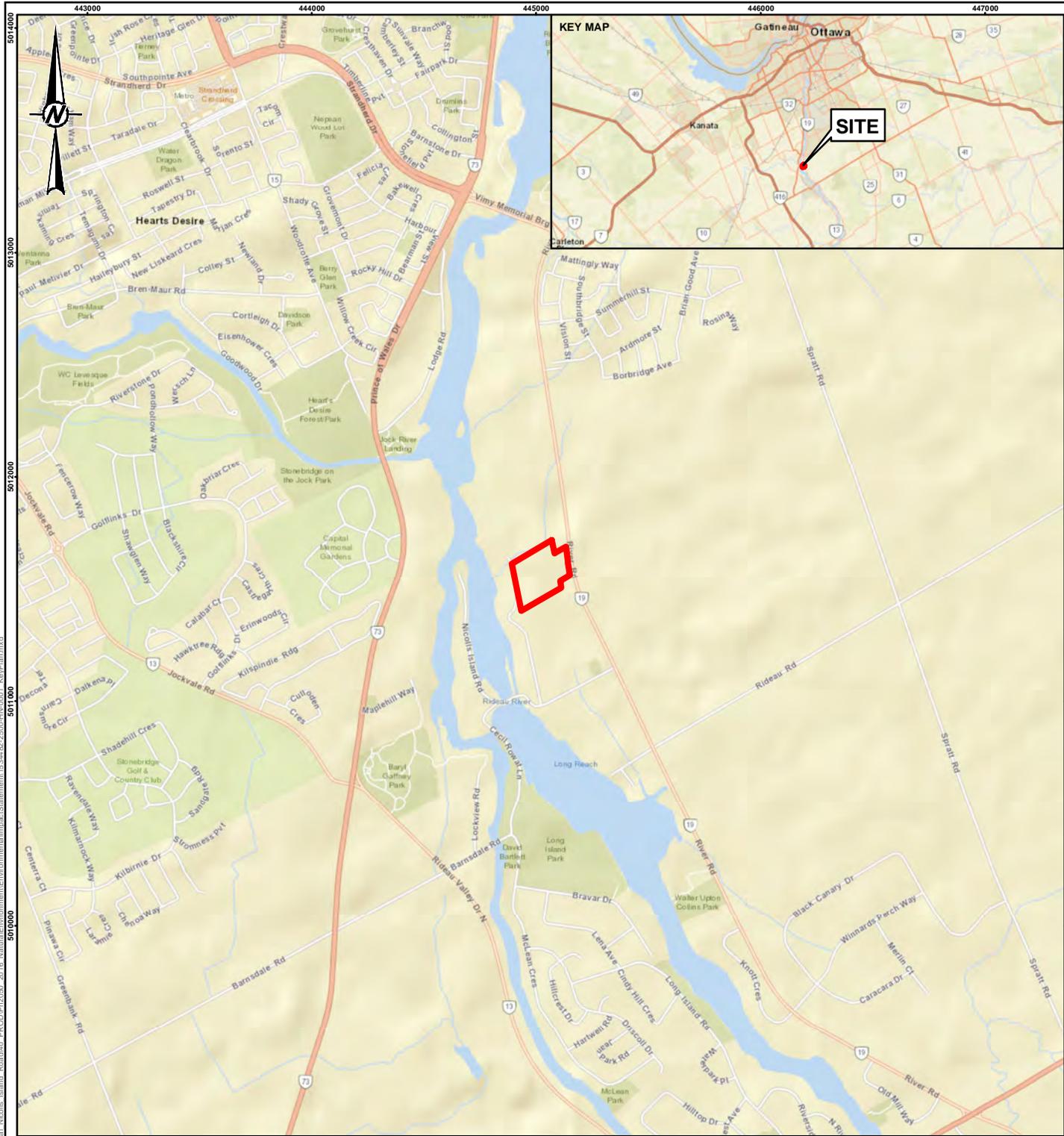
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LEGEND

 SITE BOUNDARY



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 COORDINATE SYSTEM: UTM ZONE 18 VERTICAL DATUM: CGVD28

CLIENT
NICOLLS ISLAND HOLDINGS INC. C/O REGIONAL GROUP

PROJECT
ENVIRONMENTAL IMPACT STATEMENT IN SUPPORT OF THE PROPOSED DEVELOPMENT OF THE WRIGHT LANDS, OTTAWA, ON

TITLE
KEY PLAN

CONSULTANT	
YYYY-MM-DD	2019-05-30
DESIGNED	----
PREPARED	BR
REVIEWED	GAW
APPROVED	HM

PROJECT NO.	PHASE	REV.	FIGURE
1534482	2050	0	1



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LEGEND

- BAT STATION
- BREEDING BIRD STATIONS
- FENCE
- ROADWAY
- INTERMITTENT WATERCOURSE
- PERMANENT WATERCOURSE
- TOPOGRAPHIC CONTOUR, metres
- WATERBODY
- PROPERTY PARCEL
- ECOLOGICAL LAND CLASSIFICATION

AGRC : AGRICULTURAL ROW CROP
 CUM1-1 : MIXED MEADOW
 DH : DECIDUOUS HEDGEROW
 FOD : DECIDUOUS FOREST
 FOD 5-6 : DRY TO FRESH SUGAR MAPLE – BASSWOOD DECIDUOUS FOREST
 FOD7-2 : FRESH TO MOIST ASH LOWLAND DECIDUOUS FOREST
 RES : RESIDENTIAL - PARKLAND

STUDY AREA
 SITE BOUNDARY

KEY MAP

0 25 50 100
 1:2,200 METRES

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CLIENT
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PROJECT
 ENVIRONMENTAL IMPACT STATEMENT IN SUPPORT OF THE PROPOSED DEVELOPMENT OF THE WRIGHT LANDS, OTTAWA, ON

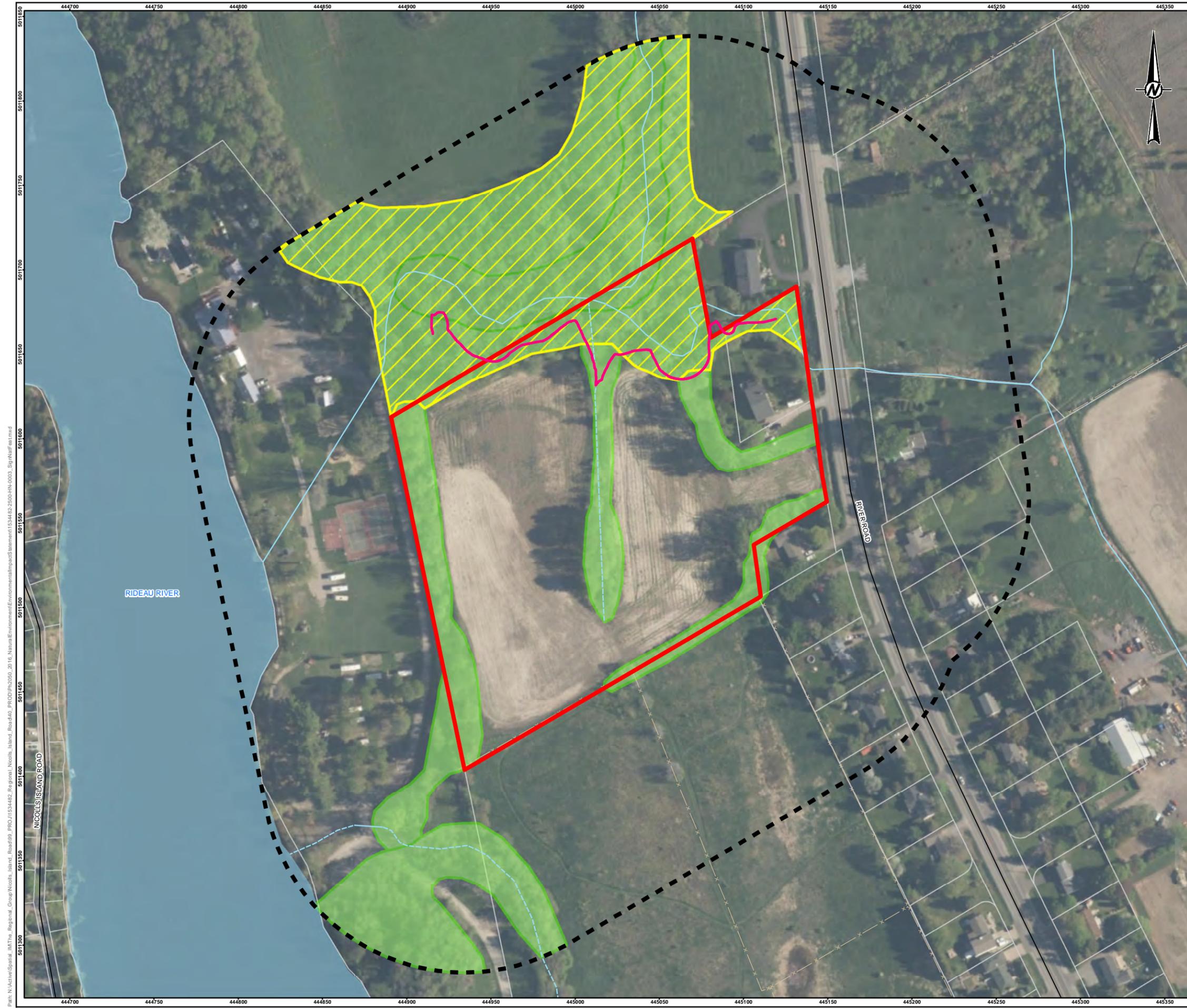
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ECOLOGICAL LAND CLASSIFICATION AND SURVEY STATIONS

CONSULTANT	YYYY-MM-DD	2019-05-30
DESIGNED	---	
PREPARED	BR	
REVIEWED	GAW	
APPROVED	HM	

PROJECT NO. 1534482 PHASE 2050 REV. 0 FIGURE 2

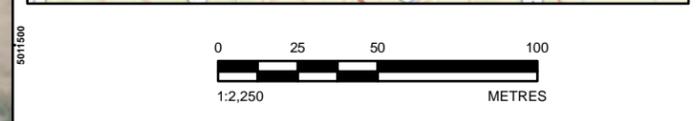
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LEGEND

- FENCE
- ROADWAY
- LIMIT OF SIGNIFICANT VALLEYLANDS
- - - - - INTERMITTENT WATERCOURSE
- PERMANENT WATERCOURSE (FISH HABITAT)
- WATERBODY
- PROPERTY PARCEL
- - - - - STUDY AREA
- SITE BOUNDARY
- POTENTIAL HABITAT FOR ENDANGERED AND THREATENED SPECIES
- HABITAT FOR SPECIES OF CONSERVATION CONCERN



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 NICOLLS ISLAND HOLDINGS INC. C/O REGIONAL GROUP

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 ENVIRONMENTAL IMPACT STATEMENT IN SUPPORT OF THE PROPOSED DEVELOPMENT OF THE WRIGHT LANDS, OTTAWA, ON

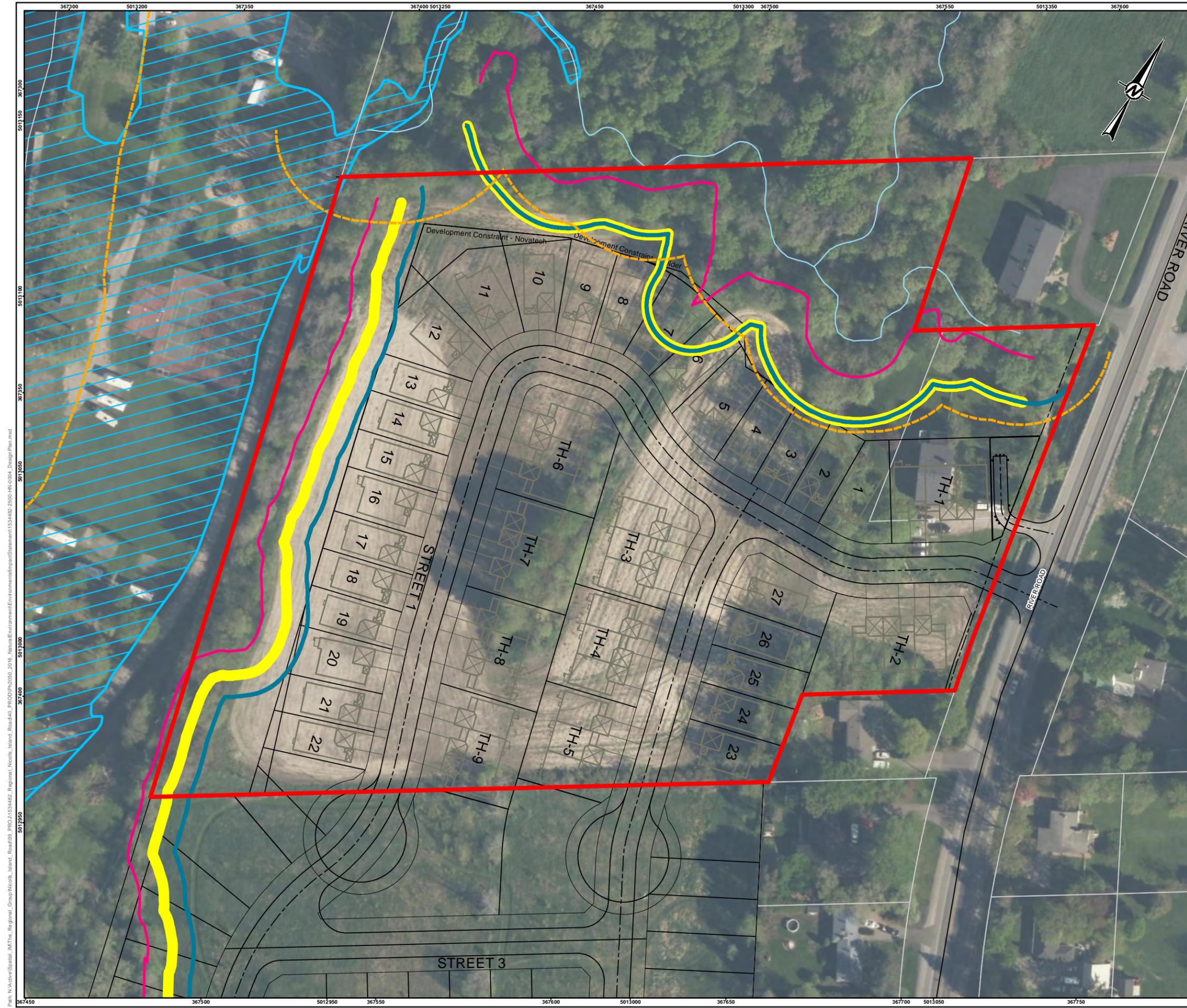
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 SIGNIFICANT NATURAL FEATURES

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PREPARED	BR	
REVIEWED	GAW	
APPROVED	HM	

PROJECT NO. 1534482 **PHASE** 2050 **REV.** 0 **FIGURE** 3

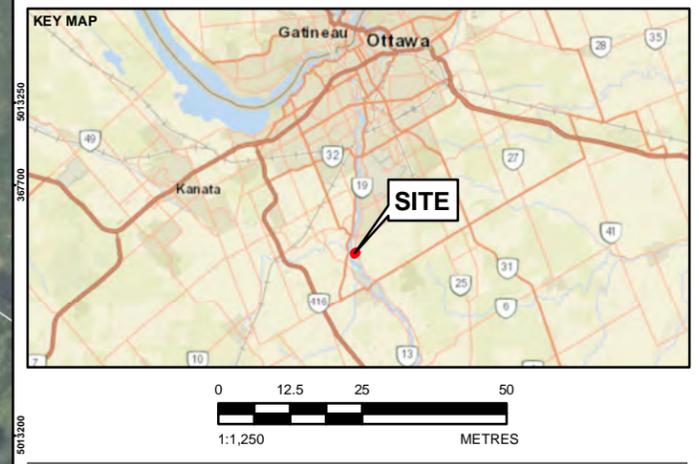
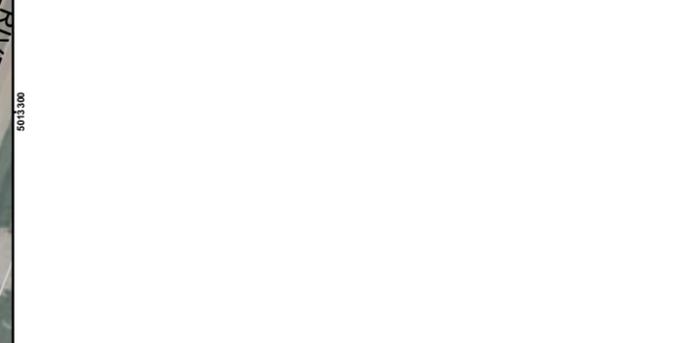
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LEGEND

- ROADWAY
- WATERCOURSE
- TOP OF SLOPE
- 15 m OFFSET FROM TOP OF SLOPE
- 30 m FROM NORMAL HIGH WATER MARK
- LIMIT OF HAZARD
- PROPERTY PARCEL
- SITE BOUNDARY
- FLOOD PLAIN



NOTE(S)

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REFERENCE(S)

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4. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 18 VERTICAL DATUM: CGVD28

CLIENT
NICOLLS ISLAND HOLDINGS INC. C/O REGIONAL GROUP

PROJECT
ENVIRONMENTAL IMPACT STATEMENT IN SUPPORT OF THE PROPOSED DEVELOPMENT OF THE WRIGHT LANDS, OTTAWA, ON

TITLE
PROPOSED DESIGN PLAN

CONSULTANT	YYYY-MM-DD	2020-02-13
	DESIGNED	---
	PREPARED	BR
	REVIEWED	GAW
	APPROVED	HM

PROJECT NO. 1534482	PHASE 2050	REV. 0	FIGURE 4
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APPENDIX A

Tree Conservation Report



GOLDER

REPORT

Tree Conservation Report

Proposed Development of Wright Lands, Ottawa, Ontario

Submitted to:

Nicolls Island Holdings Inc.

c/o The Regional Group of Companies Inc.

1737 Woodward Drive, 2nd Floor

Ottawa, ON K2C 0P9

Submitted by:

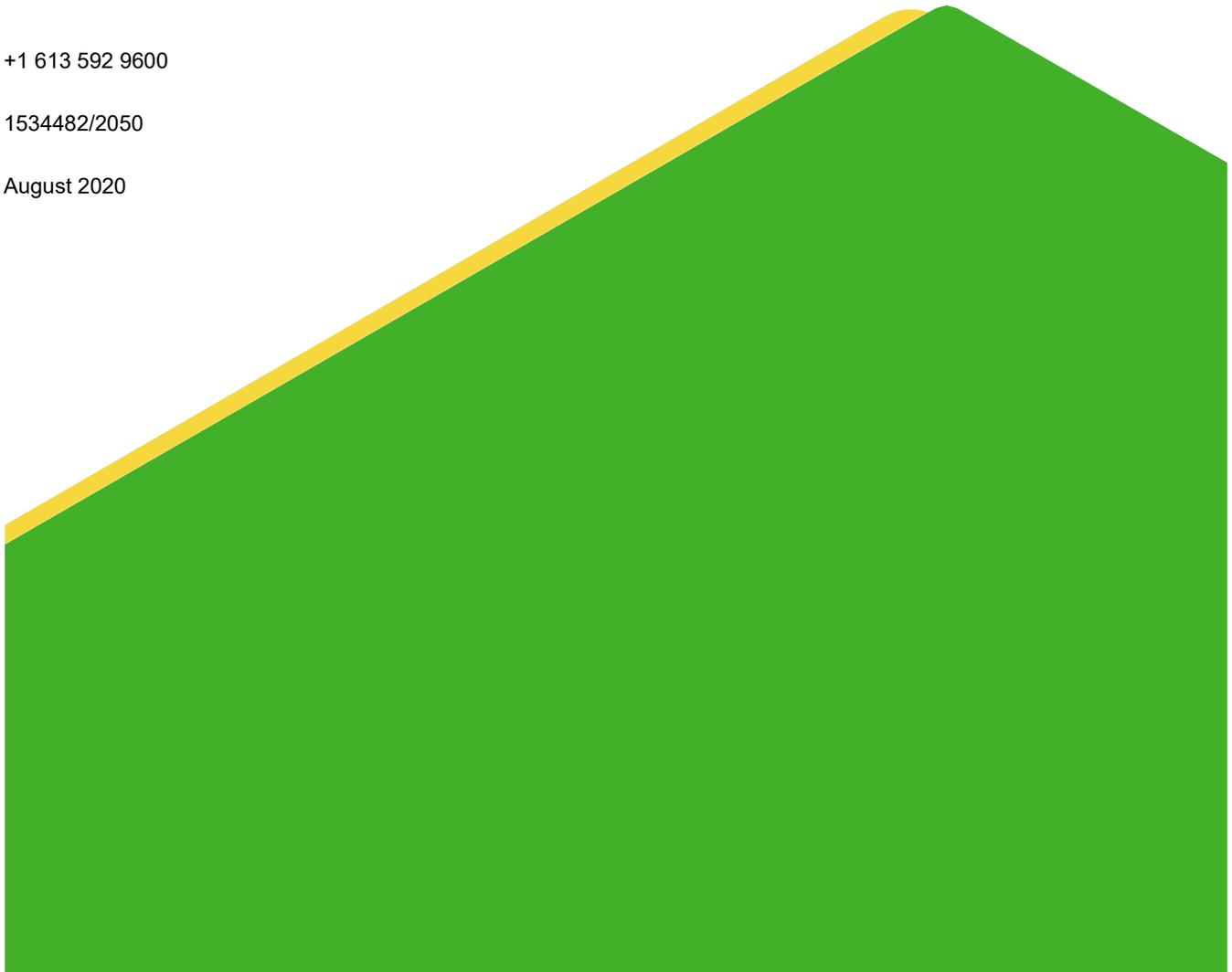
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August 2020



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Table 2: Tree Groupings Identified on the Site (Figure 1)..... 2

FIGURES

- Figure 1: Current Vegetation
- Figure 2: Proposed Design Plan

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Nicholls Island Holdings Inc. c/o The Regional Group Inc. ("Regional") to complete a Tree Conservation Report (TCR) for the property known as the Wright Lands, located on Part I of Lot 24, Broken Front Concession (Rideau Front), Geographic Township of Gloucester, City of Ottawa, Ontario (the Site), as shown on Figure 1.

This TCR has been prepared in accordance with the City of Ottawa's TCR Guidelines (Ottawa, 2016).

2.0 QUALIFICATIONS

This report was prepared by Fergus Nicoll, Terrestrial and Wetland Specialist at Golder.

Fergus Nicoll specializes in ecology with an emphasis on wetland and terrestrial ecosystems. Fergus has over 19 years of technical experience, which includes working for private consulting industry, non-government organizations, as well as the provincial and federal government. Fergus has extensive experience in collecting botanical and forest inventory data and conducting ecological land classification (ELC) for research projects, long term post-construction monitoring, environmental impact assessments, environmental effects monitoring projects, CEAA screenings, and species at risk inventories. Being adept in plant identification, he has conducted numerous plant community, tree, wetland, and habitat surveys for various types of research and monitoring projects throughout his career. He has worked across Canada in various ecoregions. While working on plant studies, he has been responsible for study design, data management, and the presentation of results. He is also provincially certified in Ecological Land Classification for Ontario, Ontario Wetland Evaluation System, and Butternut Health Assessments, and has been involved in several related workshops.

3.0 PROPOSED WORKS AND SCHEDULE

The proposed works and schedule are summarized in the Environmental Impact Statement, that is being submitted concurrently with this report (Golder 2020).

4.0 EXISTING PLANT COMMUNITIES AND TREE COVER ON THE SITE

The Site is dominated by row crop agricultural fields, with small clumps and hedgerows of trees and shrubs, and a portion of a small deciduous forest. A summary of the trees and other plants identified on the Site is included in Tables 1 and 2. Ecological Land Classification (ELC), and a vascular plant inventory has been completed for this Site and is available in the EIS (Golder 2020).

Table 1: Individual Trees Identified on the Site (Figure 1)

Tree #	Species	Diameter at breast height (dbh; cm)	Condition	Notes
1	Black cherry (<i>Prunus serotina</i>)	65	Good	Overall healthy, no signs of cavities. May provide food for wildlife.
2	Sugar maple (<i>Acer saccharum</i>)	56	Good	Large mature tree. May have hidden cavities. Potential roosting habitat for bats and other wildlife.

Table 2: Tree Groupings Identified on the Site (Figure 1)

Tree Grouping #	Stand Description*	Average Range of dbh (cm)	Notes
1	Silver maple (<i>Acer saccharinum</i>) 50% Green ash (<i>Fraxinus pennsylvanica</i>) 20% White elm (<i>Ulmus americana</i>) 10% Manitoba maple (<i>Acer negundo</i>) 10% Willow (<i>Salix</i> sp.) 10%	15 to 30 10 to 20 10 to 18 30 to 34 10 to 15	Deciduous “hedgerow” in the middle of the Site, dominated by trees, but also scattered clumps of shrubs such as common buckthorn (<i>Rhamnus cathartica</i>). Most trees are in good condition; however, some dieback apparent on ashes and elms. Silver maple may be from cultivated history.
2	Basswood (<i>Tilia americana</i>) 50% Green ash 30% Black walnut (<i>Juglans nigra</i>) 10% Bur oak (<i>Quercus macrocarpa</i>) 10%	10 to 40 20 to 24 43 2 to 4	Second part of deciduous hedgerow in middle of the Site. Also includes scattered shrubs and dense riverbank grape (<i>Vitis riparia</i>). Trees are in good condition, except the ashes are showing dieback, with emerald ash borer exit holes present.
3	Sugar maple (<i>Acer saccharum</i>) 30% Basswood 30% Green ash 10% Bur oak 10% Black cherry 5% White birch (<i>Betula papyrifera</i>) 5%	10 to 30 20 to 70 15 to 20 10 to 25 20 to 64 10 to 18	Small portion of a woodlot that is contiguous off-Site. This portion is influenced from edge effect, but overall woodlot becomes more dominated by sugar maple off-Site. Overall trees are in good condition, but with some dieback and snags as is typical in a healthy forest. This portion of the woodlot is on top of a steep valley to the north. There are many trees in the overall woodlot that provide cavities for bats and other wildlife.
4	Green ash 30% Bur oak 20% Silver maple 20% Manitoba maple 20% Hawthorn (<i>Crataegus</i> sp.) 10%	10 to 30 10 to 20 20 to 40 5 to 40 4 to 15	Deciduous “hedgerow” at western edge of Site. Most of the ashes are in serious decline, with evidence of emerald ash borer. The rest of the trees are good overall. Shrubs and vines such as wild grape are present throughout.
5	Mix of many small stems and clumps of glossy buckthorn (<i>Rhamnus frangula</i>), bur oak, highbush cranberry (<i>Viburnum trilobum</i>), red raspberry (<i>Rubus idaeus</i>), green ash, and staghorn sumac (<i>Rhus typhina</i>).	<1 to 12	Dense deciduous thicket hedgerow. Dominated by shrubs and small trees, overall in good condition.
6	Eastern cottonwood (<i>Populus deltoides</i>) 40% Manitoba maple 30% Trembling aspen (<i>Populus tremuloides</i>) 20% Weeping willow (<i>Salix x sepulcralis</i>) 10%	13 to 50 20 to 41 5 to 15 60	Small patch of trees contiguous onto adjacent residential property. Overall trees are healthy, with some woodpecker damage in cottonwoods. There is also a shrub component.
7	Eastern cottonwood 30% Green ash 30% Bur oak 20% Basswood 10% Black cherry 10%	20 to 60 5 to 25 23 to 42 10 to 34 20 to 38	Patch of trees contiguous onto adjacent residential property, and larger forest to the north. Includes rows of planted cottonwood along residential property. Overall trees in good condition, but ashes are in decline with signs of emerald ash borer present. Several dead standing white elms.

Notes: *Dominant species and percent absolute cover, only trees and tree-sized shrubs are included.

5.0 NATURAL ENVIRONMENT FEATURES ON-SITE

Natural features are described and evaluated in the EIS for the Site (Golder 2020).

6.0 PROPOSED ALTERATIONS TO TREE COVER AND POTENTIAL TREE RETENTION

The trees and shrubs on the Site include a small piece of a woodlot that is contiguous off-Site and to a few small patches growing along hedgerows and the residential area (Figure 1). There is a mix of trees in good, fair, and poor condition (Table 2). Within the woodlot to the north are many large trees (e.g., Tree 1 and Tree 2), although most are off the Site and were not included in this assessment. This woodlot provides the best tree cover and wildlife habitat on and in the vicinity of the Site. Many of the white elms (*Ulmus americana*) and green ash (*Fraxinus pennsylvanica*), are showing signs of disease, insect damage, and in some cases, severe dieback and loss of vigor.

All trees within the woodlot at the northern edge of the Site will be retained. The rest of the tree cover on the Site will be removed. Additional trees will be planted as part of the landscape plan, which will increase the overall number and quality of trees in the local landscape.

The landscape plan, which is currently not finalized, will include specific tree species, number of trees, and locations within the development. Some general recommendations are provided in Section 7.0.

7.0 RECOMMENDATIONS AND MITIGATION MEASURES

- Refer to the EIS (Golder 2020) for an assessment of Species at Risk and other natural features on the Site. Approvals for any alteration of SAR habitat should be sought in consultation with the City of Ottawa and the Ministry of Natural Resources and Forestry (MNRF).
- To protect birds that are protected under the *Migratory Birds Convention Act* (MBCA), no removal of vegetation during the active season for breeding birds (April 15 – August 15), without input from a qualified biologist (i.e., nesting surveys). Note that even with input of a qualified biologist, scheduled clearing during the active season may lead to construction delays, so it is recommended to clear outside of this period.
- The priority for tree retention should focus on the northern woodlot. There is also potential SAR bat habitat in this area and development in this area is restricted, based on the current subdivision plan.
- Planting trees along streets, and additional plantings within park areas where feasible, will help to off-set the minimal tree loss associated with the proposed development. This will be included in the landscape plan.
- Wherever tree planting is to take place on the Site, first consideration should be given to the native species that occur in the local landscape, such as: Sugar maple (*Acer Saccharum*), hackberry (*Celtis occidentalis*), bur oak (*Quercus macrocarpa*), and eastern white cedar (*Thuja occidentalis*). Cultivars of native species designed for urban conditions can be used as deemed suitable. Alien non-invasive species and cultivars should only be used where it's not reasonable to use native species or native cultivars. Alien invasive species such as Norway maple (*Acer platanoides*) should not be used in any circumstance.

- For the trees that will be retained during development, the following measures, as recommended by the City of Ottawa, should be employed for the protection and survival of trees to be retained:
 - a) If trees occur close to construction areas, erect a fence at the critical root zone (CRZ) of trees to be retained.
 - b) Do not place any material or equipment within the CRZ of the trees.
 - c) Do not attach any signs, notices or posters to the trees.
 - d) Do not raise or lower the existing grade within the CRZ without approval.
 - e) Tunnel or bore when digging within the CRZ of the trees.
 - f) Do not damage the root system, trunk or branches of the trees.
 - g) Ensure that exhaust fumes from all equipment are not directed towards any trees canopy.

8.0 LIMITATIONS AND USE OF REPORT

This report was prepared for Nicholls Island Holdings Inc. The report, which specifically includes all tables, figures and appendices, is based on data and information collected by Golder, and reflects the conditions within the study area at the time of the site investigations, supplemented by data obtained by Golder from external sources as described in this report. Golder has exercised reasonable skill, care and diligence to assess the external data acquired during the preparation of this assessment, but makes no guarantees or warranties as to the accuracy, currency or completeness of this information. This report is based upon and limited by circumstances and conditions acknowledged herein, and upon information available at the time of authoring.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

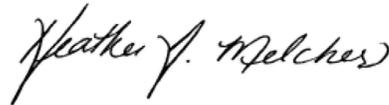
9.0 CLOSURE

We trust that the information presented in this report meets your requirements. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

Golder Associates Ltd.



Fergus Nicoll Dip.T.
Terrestrial and Wetlands Technical Specialist



Heather Melcher, M.Sc.
Associate / Senior Ecologist

FN/HM/PAS/sg

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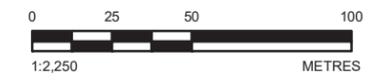
10.0 REFERENCES

Golder Associates Ltd. (Golder) 2020. Environmental Impact Statement in Support of the Proposed Development of the Wright Lands, Ottawa, ON

Ottawa, City of. 2015. Tree Conservation Report Guidelines (Online). Available: <http://ottawa.ca/en/residents/water-and-environment/trees-and-community-forests/tree-conservation-report-guidelines>



- LEGEND**
- SITE BOUNDARY
 - STUDY AREA
 - WATERBODY
 - TREES
 - TREE GROUPINGS



NOTE(S)
 1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1534482/2050.

REFERENCE(S)
 1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
 2. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
 3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
 COORDINATE SYSTEM: UTM ZONE 18 VERTICAL DATUM: CGVD28

CLIENT
 NICOLLS ISLAND HOLDINGS INC. C/O REGIONAL GROUP

PROJECT
 TREE CONSERVATION REPORT IN SUPPORT OF THE PROPOSED DEVELOPMENT OF THE WRIGHT LANDS, OTTAWA, ON

TITLE
 CURRENT VEGETATION

CONSULTANT	YYYY-MM-DD	2019-05-30
DESIGNED	---	
PREPARED	BR	
REVIEWED	GAW	
APPROVED	HM	

PROJECT NO. 1534482 **PHASE** 2050 **REV.** 0 **FIGURE** 1

Path: N:\Active\Spatial_1M\The_Regional_Group\Nicolls_Island_Road\09_PROJ\1534482_Regional_Nicolls_Island_Road\09_PROJ\1534482_2019_NaturalEnvironment\TreeConservation\Map\1534482_2050_NH_2001_CurrentVeget.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 28mm



LEGEND

- SITE BOUNDARY
- STUDY AREA
- FENCE
- ROADWAY
- INTERMITTENT WATERCOURSE
- PERMANENT WATERCOURSE
- TOPOGRAPHIC CONTOUR, metres
- WATERBODY
- PROPERTY PARCEL
- TREES
- TREE GROUPINGS



NOTE(S)

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1534482/2050.

REFERENCE(S)

1. DEVELOPMENT PLAN PROVIDED BY CLIENT IN PDF FORMAT, CONCEPT PLAN 13, DRAWING NO. 116037-CP13, DATED MAY 15, 2019.
2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014
3. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
4. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 18 VERTICAL DATUM: CGVD28

CLIENT
NICOLLS ISLAND HOLDINGS INC. C/O REGIONAL GROUP

PROJECT
TREE CONSERVATION REPORT IN SUPPORT OF THE PROPOSED DEVELOPMENT OF THE WRIGHT LANDS, OTTAWA, ON

TITLE
PROPOSED DESIGN PLAN

CONSULTANT	YYYY-MM-DD	2019-05-30
DESIGNED	---	
PREPARED	BR	
REVIEWED	GAW	
APPROVED	HM	

PROJECT NO. 1534482	PHASE 2050	REV. 0	FIGURE 2
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 29mm

APPENDIX B

Species at Risk Screening

Taxon	Common Name	Scientific Name	Species At Risk Act (Sch 1) ¹	Endangered Species Act ²	COSEWIC ³	Provincial (SRank) ⁴	Source	Habitat Requirements ⁵	Potential to Occur on Site	Rationale for Potential to Occur on Site
Amphibian	Western chorus frog - Great Lakes St. Lawrence/Canadian Shield Population	<i>Pseudacris triseriata</i>	THR	—	THR	S3	ORAA	In Ontario, this amphibian species habitat typically consists of marshes or wooded wetlands, particularly those with dense shrub layers and grasses, as this species is a poor climber. They will breed in almost any fishless pond including roadside ditches, gravel [pits and flooded swales in meadows. This species hibernates in terrestrial habitats under rocks, dead trees or leaves, in loose soil or in animal burrows. During hibernation, this species is tolerant of flooding.	Low	No areas of ponded water for breeding. Not observed during targeted surveys.
Arthropod	Monarch	<i>Danaus plexippus</i>	SC	SC	END	S2N, S4B	MNRF	In Ontario, monarch is found throughout the northern and southern regions. This butterfly is found wherever there are milkweed (<i>Asclepius spp.</i>) plants for its caterpillars and wildflowers that supply a nectar source for adults; often found on abandoned farmland, meadows, open wetlands, prairies and roadsides, but also in city gardens and parks. Important staging areas during migration occur along the north shores of the Great Lakes.	Moderate	Site contains milkweed along the edges of the field, and there are records in the vicinity.
Arthropod	West Virginia white	<i>Pieris virginiensis</i>	—	SC	—	S3	Odonate Atlas	In Ontario, West Virginia white is found primarily in the southern region of the province. This butterfly lives in moist, mature, deciduous woodlands, and the caterpillars feed only on the leaves of toothwort (<i>Cardamine spp.</i>), which are small, spring-blooming plants of the forest floor. These woodland habitats are typically maple-beech-birch dominated.	Low	Forest is wrong type, and no food plants (<i>Cardamine spp.</i>) observed.
Bird	Bank swallow	<i>Riparia riparia</i>	THR	THR	THR	S4B	MNRF, OBBA	In Ontario, the bank swallow breeds in a variety of natural and anthropogenic habitats, including lake bluffs, stream and river banks, sand and gravel pits, and roadcuts. Nests are generally built in a vertical or near-vertical bank. Breeding sites are typically located near open foraging sites such as rivers, lakes, grasslands, agricultural fields, wetlands and riparian woods. Forested areas are generally avoided.	Low	No open banks or bluffs for nesting, and no signs of nesting colony observed. Not observed during targeted surveys.
Bird	Barn swallow	<i>Hirundo rustica</i>	THR	THR	THR	S4B	MNRF, OBBA	In Ontario, barn swallow breeds in areas that contain a suitable nesting structure, open areas for foraging, and a body of water. This species nests in human made structures including barns, buildings, sheds, bridges, and culverts. Preferred foraging habitat includes grassy fields, pastures, agricultural cropland, lake and river shorelines, cleared rights-of-way, and wetlands. Mud nests are fastened to vertical walls or built on a ledge underneath an overhang. Suitable nests from previous years are reused.	Low	No structures on Site for nesting. Not observed during targeted surveys.
Bird	Black tern	<i>Chlidonias niger</i>	—	SC	NAR	S3B	MNRF	In Ontario, the black tern breeds in freshwater marshlands where it forms small colonies. It prefers marshes or marsh complexes greater than 20 ha in area and which are not surrounded by wooded area. Black terns are sensitive to the presence of agricultural activities. The black tern nests in wetlands with an even combination of open water and emergent vegetation, and still waters of 0.5-1.2 m deep. Preferred nest sites have short dense vegetation or tall sparse vegetation often consisting of cattails, bulrushes and occasionally burreed or other marshland plants. Black terns also require posts or snags for perching.	Low	No large marshes on the Site. Not observed during targeted surveys.
Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	THR	S4B	MNRF, OBBA	In Ontario, the bobolink breeds in grasslands or graminoid dominated hayfields with tall vegetation. Bobolinks prefer grassland habitat with a broad-leaf component and a substantial litter layer. They have low tolerance for presence of woody vegetation and are sensitive to extensive mowing. They are found in greater numbers in old fields where mowing and re-sowing are infrequent. Their nest is woven from grasses and forbs. It is built on the ground, in dense vegetation, usually under the cover of one or more broad-leaved forbs.	Low	Fields are row crop. Not observed during targeted surveys.
Bird	Canada warbler	<i>Cardellina canadensis</i>	THR	SC	THR	S4B	BNA Online	In Ontario, breeding habitat for the Canada warbler consists of moist mixed forests with a well-developed shrubby understory. This includes low-lying areas such as cedar and alder swamps, and riparian thickets. It is also found in densely vegetated regenerating forest openings. Suitable habitat often contains a developed moss layer and an uneven forest floor. Nests are well concealed on or near the ground in dense shrub or fern cover, often in stumps, fallen logs, overhanging stream banks or mossy hummocks.	Low	Forest is too small, and does not contain the complex understory required for this species. Not observed during targeted surveys.
Bird	Chimney swift	<i>Chaetura pelagica</i>	THR	THR	THR	S4B, S4N	MNRF, OBBA	In Ontario, chimney swift breeding habitat is varied and includes urban, suburban, rural and wooded sites. They are most commonly associated with towns and cities with large concentrations of chimneys. Preferred nesting sites are dark, sheltered spots with a vertical surface to which the bird can grip. Unused chimneys are the primary nesting and roosting structure, but other anthropogenic structures and large diameter cavity trees are also used.	Low	No structures on Site for nesting. Not observed during targeted surveys.

Taxon	Common Name	Scientific Name	Species At Risk Act (Sch 1) ¹	Endangered Species Act ²	COSEWIC ³	Provincial (SRank) ⁴	Source	Habitat Requirements ⁵	Potential to Occur on Site	Rationale for Potential to Occur on Site
Bird	Common nighthawk	<i>Chordeiles minor</i>	THR	SC	SC	S4B	BNA Online	These aerial foragers require areas with large open habitat. This includes farmland, open woodlands, clearcuts, burns, rock outcrops, alvars, bog ferns, prairies, gravel pits and gravel rooftops in cities.	Low	No open sparsely vegetated areas for nesting. Not observed during targeted surveys.
Bird	Eastern meadowlark	<i>Sturnella magna</i>	THR	THR	THR	S4B	MNRF, OBBA	In Ontario, the eastern meadowlark breeds in pastures, hayfields, meadows and old fields. Eastern meadowlarks prefer moderately tall grasslands with abundant litter cover, high grass proportion, and a forb component. They prefer well drained sites or slopes, and sites with different cover layers.	Low	Fields are row crop. Not observed during targeted surveys.
Bird	Eastern wood-pewee	<i>Contopus virens</i>	SC	SC	SC	S4B	OBBA	In Ontario, the eastern wood-pewee inhabits a wide variety of wooded upland and lowland habitats, including deciduous, coniferous, or mixed forests. It occurs most frequently in forests with some degree of openness. Intermediate-aged forests with a relatively sparse midstory are preferred. Tends to inhabit edges of younger forests having a relatively dense midstory. Also occurs in anthropogenic habitats providing an open forested aspect such as parks and suburban neighborhoods. Nest is constructed atop a horizontal branch, one to two meters above the ground, in a wide variety of deciduous and coniferous trees.	High	This species was observed during targeted surveys.
Bird	Grasshopper sparrow <i>pratensis</i> subspecies	<i>Ammodramus savannarum (pratensis subspecies)</i>	SC	SC	SC	S4B	OBBA	In Ontario, grasshopper sparrow is found in medium to large grasslands with low herbaceous cover and few shrubs. It also uses a wide variety of agricultural fields, including cereal crops and pastures. Close-grazed pastures and limestone plains (e.g. Carden and Napanee Plains) support highest density of this bird in the province (COSEWIC 2013).	Low	Fields are row crop. Not observed during targeted surveys.
Bird	Least bittern	<i>Ixobrychus exilis</i>	THR	THR	THR	S4B	MNRF	In Ontario, the least bittern breeds in marshes, usually greater than 5 ha, with emergent vegetation, relatively stable water levels and areas of open water. Preferred habitat has water less than 1 m deep (usually 10 – 50 cm). Nests are built in tall stands of dense emergent or woody vegetation. Clarity of water is important as siltation, turbidity, or excessive eutrophication hinders foraging efficiency.	Low	No marshes on the Site. Not observed during targeted surveys.
Bird	Peregrine falcon (<i>anatum</i> subspecies)	<i>Falco peregrinus anatum</i>	SC	SC	SC	S3B	BNA Online	In Ontario, the peregrine falcon breeds in areas containing suitable nesting locations and sufficient prey resources. Such habitat includes both natural locations containing cliff faces (heights of 50 - 200 m preferred) and also anthropogenic landscapes including urban centres containing tall buildings, open pit mines and quarries, and road cuts. Peregrine falcons nest on cliff ledges and crevices and building ledges. Nests consist of a simple scrape in the substrate.	Low	No cliffs, bluffs or tall buildings for nesting. Not observed during targeted surveys.
Bird	Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	THR	SC	END	S4B	MNRF	In Ontario, the red-headed woodpecker breeds in open, deciduous woodlands or woodland edges and are often found in parks, cemeteries, golf courses, orchards and savannahs. They may also breed in forest clearings or open agricultural areas provided that large trees are available for nesting. They prefer forests with little or no understory vegetation. They are often associated with beech or oak forests, beaver ponds and swamp forests where snags are numerous. Nests are excavated in the trunks of large dead trees.	Low	Forest and hedgerows may provide nesting habitat for this species, however there is no records in the vicinity on the Atlas of the Breeding Birds of Ontario. Not observed during targeted surveys.
Bird	Loggerhead shrike	<i>Lanius ludovicianus (migrans subsp)</i>	END	END	END	S2B	MNRF	In Ontario, the loggerhead shrike breeds in open country habitat characterized by short grasses with scattered shrubs or low trees. Unimproved pasture containing scattered hawthorns (<i>Crataegus</i> spp.) on shallow soils over limestone bedrock is the preferred habitat. Preferred nest sites include isolated hawthorns or red cedar. Males defend large territories of approximately 50 ha (Chabot 2007)	Low	Fields are row crop. Not observed during targeted surveys.
Bird	Short-eared owl	<i>Asio flammeus</i>	SC	SC	SC	S2N,S4B	MNRF, OBBA	In Ontario, the short-eared owl breeds in a variety of open habitats including grasslands, tundra, bogs, marshes, clearcuts, burns, pastures and occasionally agricultural fields. The primary factor in determining breeding habitat is proximity to small mammal prey resources. Nests are built on the ground at a dry site and usually adjacent to a clump of tall vegetation used for cover and concealment.	Low	Fields are row crop. Not observed during targeted surveys.
Bird	Eastern whip-poor-will	<i>Antrostomus vociferus</i>	THR	THR	THR	S4B	BNA Online	In Ontario, the whip-poor-will breeds in semi-open forests with little ground cover. Breeding habitat is dependent on forest structure rather than species composition, and is found on rock and sand barrens, open conifer plantations and post-disturbance regenerating forest. Territory size ranges from 3 to 11 ha. No nest is constructed and eggs are laid directly on the leaf litter.	Low	No large forested areas. Not observed during evening surveys.

Taxon	Common Name	Scientific Name	Species At Risk Act (Sch 1) ¹	Endangered Species Act ²	COSEWIC ³	Provincial (SRank) ⁴	Source	Habitat Requirements ⁵	Potential to Occur on Site	Rationale for Potential to Occur on Site
Bird	Wood thrush	<i>Hylocichla mustelina</i>	THR	SC	THR	S4B	OBBA	During the breeding season, the wood thrush is found in moist, deciduous hardwood or mixed stands, often previously disturbed, with a dense deciduous undergrowth and with tall trees for singing perches. Wood thrushes choose habitats based on the structure of the forest. Specifically, this species selects nesting sites with the following characteristics: lower elevations with trees >16 m in height, a closed canopy cover (>70%), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter.	Low	Forest structure is not ideal habitat for this species. In addition there are records in the vicinity of the Site on the Atlas of the Breeding Birds of Ontario. Not observed during targeted surveys.
Fish	American eel	<i>Anguilla rostrata</i>	—	END	THR	S1?	ROM	In Ontario, the American eel is native to Lake Ontario, St. Lawrence River and Ottawa River watersheds. Their current distribution includes lakes Huron, Erie, and Superior and their tributaries. The Ottawa River population is considered extirpated. The preferred habitat of the American Eel is cool water of lakes and streams with muddy or silty substrates in water temperatures between 16 and 19°C. The American eel is a catadromous fish that lives in fresh water until sexual maturity then migrates to the Sargasso Sea to spawn.	Low	Stream is not the right type for this species.
Fish	Lake sturgeon - Great Lakes / upper St. Lawrence Population	<i>Acipenser fulvescens</i>	—	THR	THR	S2	ROM	In Ontario, the lake sturgeon, a large prehistoric freshwater fish, is found in all the Great Lakes and in all drainages of the Great Lakes and of Hudson Bay. This species typically inhabits highly productive shoal areas of large lakes and rivers. They are bottom dwellers, and prefer depths between 5-10 m and mud or gravel substrates. Small sturgeons are often found on gravelly shoals near the mouths of rivers. They spawn in depths of 0.5 to 4.5 metres in areas of swift water or rapids. Where suitable spawning rivers are not available, such as in the lower Great Lakes, they are known to spawn in wave action over rocky ledges or around rocky islands.	Low	Stream is not the right type for this species.
Mammal	Eastern small-footed myotis	<i>Myotis leibii</i>	—	END	—	S2S3	BCI	This species is not known to roost within trees, but there is very little known about its roosting habits. The species generally roosts on the ground under rocks, in rock crevices, talus slopes and rock piles. It occasionally inhabits buildings. Areas near the entrances of caves or abandoned mines may be used for hibernaculum, where the conditions are drafty with low humidity, and may be subfreezing.	Low	No talus or rock piles present at the Site. This species not recorded during targeted surveys.
Mammal	Little brown myotis	<i>Myotis lucifugus</i>	END	END	END	S4	MNRF	In Ontario, this species range is extensive and covers much of the province. It will roost in both natural and man-made structures. They require a number of large dead trees, in specific stages of decay and that project above the canopy in relatively open areas. May form nursery colonies in the attics of buildings within 1 km of water. Caves or abandoned mines may be used for hibernaculum, but high humidity and stable above freezing temperatures are required.	High	This species was recorded on the Site during targeted surveys.
Mammal	Tri-colored bat	<i>Perimyotis subflavus</i>	END	END	END	S3?	BCI	The appearance of this species at tree-top levels indicate that they may roost in foliage or in high tree cavities and crevices. They are not often found in buildings or in deep woods, seeming to prefer edge habitats near areas of mixed agricultural use. Hibernation sites are found deep within caves or mines in areas of relatively warm temperatures. These bats have strong roost fidelity to their winter hibernation sites and may choose the exact same spot in a cave or mine from year to year.	Low	This species was not recorded during targeted surveys.
Mammal	Northern myotis	<i>Myotis septentrionalis</i>	END	END	END	S3	MNRF	In Ontario, this species range is extensive and covers much of the province. It will usually roost in hollows, crevices, and under loose bark of mature trees. Roosts may be established in the main trunk or a large branch of either living or dead trees. Caves or abandoned mines may be used for hibernaculum, but high humidity and stable above freezing temperatures are required.	Low	This species was not recorded during targeted surveys.
Reptile	Blanding's turtle - Great Lakes/St. Lawrence population	<i>Emydoidea blandingii</i>	THR	THR	END	S3	MNRF	Blanding's turtle will utilize a range of aquatic habitats, but favor those with shallow, standing or slow-moving water, rich nutrient levels, organic substrates and abundant aquatic vegetation. They will use rivers, but prefer slow-moving currents and are likely only transients in this type of habitat. This species is known to travel great distances over land in the spring in to order reach nesting sites, which can include dry conifer or mixed forests, partially vegetated fields, and roadsides. Suitable nesting substrates include organic soils, sands, gravel and cobble. They hibernate underwater and infrequently under debris close to water bodies.	Low	No open water wetlands on or adjacent to the Site.

Taxon	Common Name	Scientific Name	Species At Risk Act (Sch 1) ¹	Endangered Species Act ²	COSEWIC ³	Provincial (SRank) ⁴	Source	Habitat Requirements ⁵	Potential to Occur on Site	Rationale for Potential to Occur on Site
Reptile	Eastern ribbonsnake - (Great Lakes population)	<i>Thamnophis sauritus</i>	SC	SC	SC	S4	MNRF	Eastern ribbonsnake is semi-aquatic, and is rarely found far from shallow ponds, marshes, bogs, streams or swamps bordered by dense vegetation. They prefer sunny locations and bask in low shrub branches. Hibernation occurs in mammal burrows, rock fissures or even ant mounds.	Low	No open water wetlands on or adjacent to the Site.
Reptile	Northern map turtle	<i>Graptemys geographica</i>	SC	SC	SC	S3	ORAA	Northern map turtle prefers large waterbodies with slow-moving currents, soft substrates, and abundant aquatic vegetation. Ideal stretches of shoreline contain suitable basking sites, such as rocks and logs. Hibernation takes place in soft substrates under deep water.	Low	No large open water bodies on the Site.
Reptile	Snapping turtle	<i>Chelydra serpentina</i>	SC	SC	SC	S3	NHIC, MNRF	Snapping turtle utilizes a wide range of waterbodies, but shows preference for areas with shallow, slow-moving water, soft substrates and dense aquatic vegetation. Hibernation takes place in soft substrates under water. Nesting sites consist of sand or gravel banks along waterways or roadways.	Low	Stream on Site is likely too shallow and too small for this species.
Reptile	Stinkpot or Eastern musk turtle	<i>Sternotherus odoratus</i>	THR	SC	SC	S3	MNRF	Eastern musk turtle is very rarely out of water and prefers permanent bodies of water that are shallow and clear, with little or no current and soft substrates with abundant organic materials. Hibernation occurs in soft substrates under water. Eggs are sometimes laid on open ground, or in shallow nests in decaying vegetation, shallow gravel or rock crevices.	Low	No open water wetlands on Site.
Vascular Plant	American ginseng	<i>Panax quinquefolius</i>	END	END	END	S2	ROM	American ginseng is found in moist, undisturbed and relatively mature deciduous woods often dominated by sugar maple. It is commonly found on well-drained, south-facing slopes. American ginseng grows under closed canopies in neutral, loamy soils.	Low	Forest was searched and this species was not found.
Vascular Plant	Butternut	<i>Juglans cinerea</i>	END	END	END	S2?	MNRF	Butternut is found along stream banks, on wooded valley slopes, and in deciduous and mixed forests. It is commonly associated with beech, maple, oak and hickory. Butternut prefers moist, fertile, well-drained soils, but can also be found in rocky limestone soils. This species is shade intolerant.	Low	Site was searched and this species was not found.
Vascular Plant	Eastern prairie fringed-orchid	<i>Platanthera leucophaea</i>	END	END	END	S2	ROM	Eastern prairie fringed-orchid grows in wet prairies, fens, bogs, wet meadows, and wet successional fields. It grows in full sun in neutral to mildly calcareous substrates, and occasionally grows along roadsides or lake margins.	Low	No fens or similar wetland habitats on Site.

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APPENDIX C

List of Vascular Plants

Scientific Name	Common Name	Origin ^a	Global Rarity Status ^b	Ontario Rarity Status ^b	SARA ^c	ESA ^d
<i>Acer negundo</i>	Manitoba maple	(N)	G5	S5	-	-
<i>Acer rubrum</i>	Red maple	N	G5	S5	-	-
<i>Acer saccharum</i>	Sugar maple	N	G5	S5	-	-
<i>Actaea rubra</i>	Red baneberry	N	G5	S5	-	-
<i>Alliaria petiolata</i>	Garlic mustard	I	GNR	SNA	-	-
<i>Ambrosia artemisiifolia</i>	Ragweed	N	G5	S5	-	-
<i>Amphicarpaea bracteata</i>	Hog-peanut	N	G5	S5	-	-
<i>Anemone canadensis</i>	Canada anemone	N	G5	S5	-	-
<i>Apocynum androsaemifolium</i>	Spreading dogbane	N	G5	S5	-	-
<i>Aralia nudicaulis</i>	Wild sarsaparilla	N	G5	S5	-	-
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	N	G5	S5	-	-
<i>Asarum canadense</i>	Wild ginger	N	G5	S5	-	-
<i>Asclepias syriaca</i>	Common milkweed	N	G5	S5	-	-
<i>Athyrium filix-femina</i>	Lady fern	N	G5T5	S5	-	-
<i>Barbarea vulgaris</i>	Winter cress	I	GNR	SNA	-	-
<i>Betula papyrifera</i>	White birch	N	G5	S5	-	-
<i>Betula pendula</i>	European white birch	I	GNR	SNA	-	-
<i>Bromus inermis</i>	Smooth brome	I	GNR	SNA	-	-
<i>Cerastium fontanum</i>	Mouse-ear chickweed	I	GNR	SNA	-	-
<i>Chelidonium majus</i>	Celandine	I	GNR	SNA	-	-
<i>Cirsium arvense</i>	Canada thistle	I	GNR	SNA	-	-
<i>Cirsium vulgare</i>	Bull thistle	I	GNR	SNA	-	-
<i>Cornus alternifolia</i>	Alternate-leaved dogwood	N	G5	S5	-	-
<i>Cornus stolonifera</i>	Red osier dogwood	N	G5	S5	-	-
<i>Crataegus</i> sp.	Hawthorne sp.				-	-
<i>Dactylis glomerata</i>	Orchard grass	I	GNR	SNA	-	-
<i>Echinochloa crusgalli</i>	Barnyard grass	I	GNR	SNA	-	-
<i>Equisetum arvense</i>	Field horsetail	N	G5	S5	-	-
<i>Erigeron annuus</i>	Daisy fleabane	N	G5	S5	-	-
<i>Eurybia macrophylla</i>	Large-leaved aster	N	G5	S5	-	-
<i>Fragaria virginiana</i>	Common strawberry	N	G5	S5	-	-
<i>Fraxinus americana</i>	White ash	N	G5	S5	-	-
<i>Fraxinus pennsylvanica</i>	Green ash	N	G5	S5	-	-
<i>Geum canadense</i>	White avens	N	G5	S5	-	-
<i>Helianthus annuus</i>	Common sunflower	I	G5TNR	SNA	-	-
<i>Hesperis matronalis</i>	Dame's rocket	I	G4G5	SNA	-	-
<i>Impatiens capensis</i>	Spotted jewelweed	N	G5	S5	-	-
<i>Juglans nigra</i>	Black walnut	(N)	G5	S4	-	-
<i>Leonurus cardiaca</i>	Common motherwort	I	GNR	SNA	-	-
<i>Leucanthemum vulgare</i>	Ox-eye daisy	I	GNR	SNA	-	-
<i>Lonicera canadensis</i>	Fly-honeysuckle	N	G5	S5	-	-
<i>Lythrum salicaria</i>	Purple loosestrife	I	G5	SNA	-	-
<i>Maianthemum canadense</i>	Canada mayflower	N	G5	S5	-	-
<i>Maianthemum racemosum</i>	False Solomon's-seal	N	G5	S5	-	-
<i>Matteuccia struthiopteris</i>	Ostrich fern	N	G5	S5	-	-
<i>Medicago sativa</i>	Alfalfa	I	GNR	S5	-	-
<i>Onoclea sensibilis</i>	Sensitive fern	N	G5	S5	-	-
<i>Osmunda cinnamomea</i>	Cinnamon fern	N	G5	S5	-	-
<i>Parthenocissus inserta</i>	Virginia creeper	N	G5	S5	-	-
<i>Phalaris arundinacea</i>	Reed canary grass	N	G5	S5	-	-
<i>Phleum pratense</i>	Timothy	I	GNR	SNA	-	-

Scientific Name	Common Name	Origin ^a	Global Rarity Status ^b	Ontario Rarity Status ^b	SARA ^c	ESA ^d
<i>Physocarpus opulifolius</i>	Ninebark	N	G5	S5	-	-
<i>Pinus strobus</i>	White pine	N	G5	S5	-	-
<i>Poa annua</i>	Annual bluegrass	I	GNR	SNA	-	-
<i>Poa pratensis</i>	Kentucky bluegrass	I	G5T5?	SNA	-	-
<i>Populus deltoides</i>	Eastern cottonwood	N	G5T5	S5	-	-
<i>Potentilla argentea</i>	Silvery cinquefoil	I	GNR	SNA	-	-
<i>Prunus serotina</i>	Black cherry	N	G5	S5	-	-
<i>Quercus macrocarpa</i>	Bur oak	N	G5	S5	-	-
<i>Rhamnus frangula</i>	Glossy buckthorn	I	GNR	SNA	-	-
<i>Rhus typhina</i>	Staghorn sumac	N	G5	S5	-	-
<i>Ribes cynosbati</i>	Prickly gooseberry	N	G5	S5	-	-
<i>Ribes hirtellum</i>	Smooth gooseberry	N	G5	S5	-	-
<i>Rubus idaeus</i>	Red raspberry	N	G5T5	S5	-	-
<i>Rubus occidentalis</i>	Black raspberry	N	G5	S5	-	-
<i>Rubus odoratus</i>	Purple-flowering raspberry	N	G5	S5	-	-
<i>Rumex crispus</i>	Curled dock	I	GNR	SNA	-	-
<i>Salix discolor</i>	Pussy willow	N	G5	S5	-	-
<i>Salix x sepulcralis</i>	Weeping willow	I	GNR	SNA	-	-
<i>Sambucus canadensis</i>	Common elderberry	N	G5	S5	-	-
<i>Schedonorus arundinacea</i>	Tall fescue	I	GNR	SNA	-	-
<i>Sinapis arvensis</i>	Charlock	I	GNR	SNA	-	-
<i>Solidago canadensis</i>	Canada goldenrod	N	G5T5	S5	-	-
<i>Solidago flexicaulis</i>	Zig-zag goldenrod	N	G5	S5	-	-
<i>Solidago rugosa</i>	Rough goldenrod	N	G5	S5	-	-
<i>Sonchus arvensis</i>	Common sow-thistle	I	GNR	SNA	-	-
<i>Symphotrichum lanceolatum</i>	Panicled aster	N	G5T5	S5	-	-
<i>Symphotrichum lateriflorum</i>	Calico aster	N	G5T?	S5	-	-
<i>Symphotrichum novae-angliae</i>	New England aster	N	G5	S5	-	-
<i>Symphotrichum ciliolatum</i>	Blue aster	N	G5	S5	-	-
<i>Symphotrichum cordifolium</i>	Heart-leaved aster	N	G5	S5	-	-
<i>Taraxacum officinale</i>	Common dandelion	I	G5	SNA	-	-
<i>Tilia americana</i>	Basswood	N	G5	S5	-	-
<i>Trifolium pratense</i>	Red clover	I	GNR	SNA	-	-
<i>Trifolium repens</i>	White clover	I	GNR	SNA	-	-
<i>Trillium grandiflorum</i>	White trillium	N	G5	S5	-	-
<i>Turritis glabra</i>	Tower mustard	N	G5	S5	-	-
<i>Tussilago farfara</i>	Colt's-foot	I	GNR	SNA	-	-
<i>Ulmus americana</i>	White elm	N	G5?	S5	-	-
<i>Viburnum acerifolium</i>	Maple-leaved viburnum	N	G5	S5	-	-
<i>Vicia cracca</i>	Cow-vetch	I	GNR	SNA	-	-
<i>Vitis riparia</i>	Riverbank grape	N	G5	S5	-	-

Notes:

^a Origin: N = Native; (N) = Native but not in study area region; I = Introduced.

^b Ranks based upon determinations made by the Ontario Natural Heritage Information Centre.

G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.

SNA = Not applicable for Ontario Ranking (e.g. Exotic species); SNR = Provincial conservation status not yet assessed;

B = status applies to the breeding population of the species

^c Species at Risk Act (SARA), Schedule 1

^d Ontario *Endangered Species Act* (ESA)

APPENDIX D

List of Wildlife

Common Name	Scientific Name	Origin ^a	Global Rarity Status ^b	Ontario Rarity Status ^b	SARA ^c	ESA ^d
Mammals						
Big brown bat	<i>Eptesicus fuscus</i>	N	G5	S5	—	—
Coyote	<i>Canis latrans</i>	N	G5	S5	—	—
Eastern chipmunk	<i>Tamias striatus</i>	N	G5	S5	—	—
Ermine	<i>Mustela erminea</i>	N	G5	S5	—	—
Grey squirrel	<i>Sciurus carolinensis</i>	N	G5	S5	—	—
Hoary bat	<i>Lasiurus cinereus</i>	N	G5	S4	—	—
Little brown myotis	<i>Myotis lucifugus</i>	N	G5	S4	Endangered	Endangered
Raccoon	<i>Procyon lotor</i>	N	G5	S5	—	—
Silver-haired bat	<i>Lasionycteris noctivagans</i>	N	G5	S4	—	—
White-tailed deer	<i>Odocoileus virginianus</i>	N	G5	S5	—	—
Woodchuck	<i>Marmota monax</i>	N	G5	S5	—	—
Birds						
American crow	<i>Corvus brachyrhynchos</i>	N	G5	S5B	—	—
American goldfinch	<i>Carduelis tristis</i>	N	G5	S5B	—	—
American redstart	<i>Setophaga ruticilla</i>	N	G5	S5B	—	—
American robin	<i>Turdus migratorius</i>	N	G5	S5B	—	—
Baltimore oriole	<i>Icterus galbula</i>	N	G5	S4B	—	—
Black-capped chickadee	<i>Poecile atricapilla</i>	N	G5	S5	—	—
Blue jay	<i>Cyanocitta cristata</i>	N	G5	S5	—	—
Canada goose	<i>Branta canadensis</i>	N	G5	S5	—	—
Cedar waxwing	<i>Bombycilla cedrorum</i>	N	G5	S5B	—	—
Chipping sparrow	<i>Spizella passerina</i>	N	G5	S5B	—	—
Common grackle	<i>Quiscalus quiscula</i>	N	G5	S5B	—	—
Common yellowthroat	<i>Geothlypis trichas</i>	N	G5	S5B	—	—
Cooper's hawk	<i>Accipiter cooperii</i>	N	G5	S4	—	—
Downy woodpecker	<i>Picoides pubescens</i>	N	G5	S5	—	—
Eastern wood-pewee	<i>Contopus virens</i>	N	G5	S4B	—	Special Concern
European starling	<i>Sturnus vulgaris</i>	I	G5	SNA	—	—
Great-crested flycatcher	<i>Myiarchus crinitus</i>	N	G5	S4B	—	—
House wren	<i>Troglodytes aedon</i>	N	G5	S5B	—	—
Mourning dove	<i>Zenaida macroura</i>	N	G5	S5	—	—
Northern cardinal	<i>Cardinalis cardinalis</i>	N	G5	S5	—	—
Purple martin	<i>Progne subis</i>	N	G5	S4B	—	—
Red-eyed vireo	<i>Vireo olivaceus</i>	N	G5	S5B	—	—
Red-winged blackbird	<i>Agelaius phoeniceus</i>	N	G5	S4	—	—
Rock pigeon	<i>Columba livia</i>	I	G5	SNA	—	—
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	N	G5	S4B	—	—
Song sparrow	<i>Melospiza melodia</i>	N	G5	S5B	—	—
Warbling vireo	<i>Vireo gilvus</i>	N	G5	S5B	—	—
Wild turkey	<i>Meleagris gallopava</i>	(N)	G5	S5	—	—
Yellow warbler	<i>Setophaga petechia</i>	N	G5	S5B	—	—
Herpetiles						
American toad	<i>Bufo americanus</i>	N	S5	G5	—	—
Northern leopard frog	<i>Rana pipiens</i>	N	S5	G5	—	—
Insects						
Cabbage white	<i>Pieris rapae</i>	I	G5	SNA	—	—
Canada tiger swallowtail	<i>Euphyes vestris</i>	N	G5	S5	—	—
Common ringlet	<i>Coenonympha tullia</i>	N	G5	S5	—	—
Northern crescent	<i>Phycoides pascoensis</i>	N	G5	S5	—	—
Northern pearly eye	<i>Enodia anhedon</i>	N	G5	S5	—	—
White-faced meadowhawk	<i>Sympetrum obtrusum</i>	N	S5	G5	—	—

Notes:

^a Origin: N = Native; (N) = Native but not in study area region; I = Introduced.

^b Ranks based upon determinations made by the Ontario Natural Heritage Information Centre .

G = Global; S = Provincial; Ranks 1-3 are considered imperiled or rare; Ranks 4 and 5 are considered secure.

SNA = Not applicable for Ontario Ranking (e.g. Exotic species)

^c Canada *Species at Risk Act* (Schedule 1)

^d Ontario *Endangered Species Act*

APPENDIX E

Curriculum Vitae

Education

M.Sc. Applied Marine Science, University of Plymouth, Devon, UK, 1998

B.Sc. (Honours) Biology, Laurentian University, Sudbury, Ontario, 1996

Certifications

PADI Master Scuba Diver Trainer, 2000

Small Craft Boat Operator, 2003

Small Non-pleasure Vessel Basic Safety - MED A3, 2011

Canadian Red Cross First Aid and CPR, 2012

WHMIS Training, 1990, 2001, 2004

Languages

English – Fluent

Golder Associates Ltd. – Mississauga**Employment History*****Golder Associates Ltd. – Mississauga, Ontario***

Principal, Senior Ecologist (2004 to Present)

Heather Melcher is a Principal, Senior Ecologist and Project Manager/Director with Golder Associates. Heather has over 18 years of experience working in a number of sectors including transportation, oil and gas, transmission, land development, power, aggregates and mining. Her experience lies in designing, managing and carrying out environmental impact assessments within provincial and federal frameworks and environmental land use policies for projects of various size and complexity. She leads a team of ecologists and multi-disciplinary project teams to holistically assess potential project impacts through integration of components. Heather works closely with provincial and federal agencies to help her clients navigate changing planning and species at risk (SAR) legislation. Heather has experience developing rehabilitation plans for disturbed sites and biodiversity plans that integrate the ecology of a smaller site into the regional system as well as developing compensation habitat plans and mitigation plans for SAR. Heather is also a recognized expert witness for Local Planning Appeal Tribunal (LPAT) hearings in Ontario.

ESG International – Guelph, Ontario

Ecologist/Environmental Planner (2002 to 2003)

Specialized in resource management and land use planning. Worked with clients, residential and commercial land developers, land planners and regulatory agencies to obtain permits and approvals, specifically within the framework of Niagara Escarpment and Oak Ridges Moraine legislation. Compiled, assessed and reported on marine data collected for international projects.

CBCL Ltd – Halifax, Nova Scotia

Ecologist/Environmental Planner (2001 to 2002)

Intermediate project manager responsible for designing and implementing environmental effects monitoring, environmental impact assessment, and natural heritage projects. Developed and implemented marine and freshwater fisheries and benthic investigations, aquatic habitat assessments, and water quality and sediment assessments. Liaised with clients and regulatory agencies (federal and provincial), to obtain development permits and approvals.

Southeast Environmental Association – Montague, Prince Edward Island

Bacterial Water Quality Project Coordinator (2000 to 2002)

Responsible for collection of freshwater samples and laboratory analysis of faecal coliform bacteria to determine the effects of livestock farming runoff on the shellfish industry. Liaised with landowners and the agricultural engineer to establish effective remediation efforts, and developed education initiatives involving the general public, farmers and shell fishers. Reported to a multi-stakeholder board.

PROJECT EXPERIENCE – SPECIES AT RISK**TransCanada - Various Sites in Ontario**
Ontario, Canada

Natural environment component lead for multi-year annual SAR and migratory bird monitoring at numerous sites across Ontario since 2012. In support of TransCanada's right-of-way maintenance brushing program. Provide SAR advice and liaise with MNRF to develop construction monitoring protocols for SAR and migratory birds. Lead crews to complete monitoring on an annual basis.

Leader Resources Services Ltd.
Various Locations,
Ontario, Canada

Project manager for a number of wind power projects under the Ontario Renewable Energy Approvals Act (REA). Worked with the client and the MNRF to develop protocols and coordinate field surveys. Completed and submitted ESA permitting applications and compensation plans.

Lafarge Canada Ltd.
Various Locations,
Ontario, Canada

Project manager and natural environment component lead for a number of licence applications for proposed new and expanded aggregate extraction operations (pits and quarries) in Ontario under the ARA. Developed survey protocols, consulted with the MNRF, registered for activities under the ESA (Notice of Activity), completed Information Gathering Forms (IGF), prepared and submitted permit applications and developed compensation plans.

PROJECT EXPERIENCE – TRANSMISSION**Hydro One Circuit B5C/B6C Line Refurbishment EA**
Westover to Burlington,
Ontario, Canada

Natural environment component lead for a provincial Class Environmental Assessment for a 40 km line refurbishment. Designed the field program (terrestrial and aquatic), analysed and integrated data with other physical resource disciplines. Completed a comprehensive and integrated impact assessment. Led consultation with regulatory agencies including two district MNRF offices, Hamilton Conservation Authority, Conservation Halton, Grand River Conservation Authority, Niagara Escarpment Commission, and participating in the public consultation process. Provided input into alternatives assessment for temporary hydro line bypass and developed reports.

Wataynikaneyap Power Phase 2 Transmission Line
Northwestern Ontario,
Canada

Senior advisor and technical reviewer for the wildlife component of permitting. Worked with the permitting lead and the wildlife component lead to design field programs, consult and negotiate with the MNRF and Environment and Climate Change Canada/Canadian Wildlife Service (ECCC/CWS), and prepare technical supporting documents for permitting and permit applications under the ESA, the Public Lands Act, and the federal Species at Risk Act (SARA). Provided senior leadership and technical guidance and review for all deliverables.

**Nextbridge East-West
Tie Transmission Line**Wawa to Thunder Bay,
Ontario, Canada

Senior advisor and technical reviewer for wildlife permitting for the construction and operation of a 450 km transmission corridor. Worked with the permitting lead and the wildlife component lead to design field programs, consult and negotiate with the MNRF and ECCC/CWS, and prepare technical supporting documents for permitting and permit applications under the ESA, the Public Lands Act, and the SARA. Provided senior leadership and technical guidance and review for all deliverables.

PROJECT EXPERIENCE – SERVICING/INFRASTRUCTURE**Peel Wastewater
Treatment Plan**Region of Peel, Ontario,
Canada

Project manager and senior advisor and technical reviewer for the natural environment component for a Schedule C Environmental Assessment for the capacity expansion of the central Mississauga wastewater system. Managed a multi-disciplinary team including natural environment, archaeology, cultural heritage, and geotechnical engineering. Designed the natural environment field program and worked with the component lead to analyse and interpret data. Provided senior leadership and technical guidance and review for all natural environment deliverables.

**Niagara Falls
Wastewater Servicing
Strategy**Niagara Falls, Ontario,
Canada

Natural environment component lead for a Class Environmental Assessment for a Niagara Falls wastewater servicing strategy for a new south Niagara Falls wastewater treatment plant. Developed ecological matrices for determining the short-list of alternative sites, including constraints analyses, designed field program and managed a team of ecologists. Analysed, interpreted and integrated data with physical resource components. Completed impact assessment, developed reports and participated in the public consultation process.

**Clarksburg Master
Servicing Plan**Clarksburg, Ontario,
Canada

Senior advisor and technical reviewer for the natural environment component for a Class Environmental Assessment. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

Cambridge Zone 3Cambridge, Ontario,
Canada

Senior advisor and technical reviewer for the natural environment component for a Class Environmental Assessment for regional water system upgrades in Cambridge and North Dumfries. Worked with the component lead to design field program and analyse and interpret data. Provided senior leadership and technical guidance and review for all deliverables.

PROJECT EXPERIENCE – RENEWABLE ENERGY**Trillium Power Wind Corporation**Lake Ontario, Ontario,
Canada

Project manager and natural environment lead for an offshore wind power project in Lake Ontario under O. Reg. 359/09 Renewable Energy Approvals (REA). Coordinated and managed a multi-disciplinary team comprised of noise specialists, biologists, archaeologists, public consultation specialists, aboriginal engagement specialists, visual impact assessment specialists and geophysicists. Designed terrestrial and aquatic field surveys, including avian, bat and fisheries assessments. Led provincial and federal agency consultation and participated in public open houses. Impact assessment and reporting, designed to satisfy both provincial and federal (CEAA) requirements, was underway when the project was curtailed.

Leader Resources Services CorporationVarious Locations,
Ontario, Canada

Project manager and project director/senior technical advisor for four wind farm projects under O. Reg. 359/09 REA in Huron County, Ontario. Coordinated and managed a multi-disciplinary team comprised of noise specialists, natural heritage specialists, archaeologists, cultural heritage specialists, public consultation specialists and aboriginal engagement specialists. Led regulatory agency consultation specifically regarding SAR, avian and bat issues, and participated in public consultation process. Directed and reviewed all baseline natural environment impact assessment, mitigation and monitoring reporting, including species at risk, waterbodies, and wildlife/habitat (with a focus on birds and bats). Completed REA-specific project reports.

PROJECT EXPERIENCE – OIL & GAS**Enbridge Bayview Avenue Pipeline Replacement**

Ontario, Canada

Natural environment component lead for pipeline replacement project. Coordinated SAR screening, natural heritage feature mapping, site investigations, impact assessment, tree inventory, DFO self-assessment, consultation with MECP, registration of activities (NoA) under the Endangered Species Act and development of mitigation plan. Worked with team to obtain Toronto and Region Conservation Authority (TRCA) permits.

Enbridge Pipelines Inc. Line 9Southern Ontario,
Canada

Project manager for natural environment component of pipeline maintenance project in southern Ontario. Coordinated SAR screening and natural heritage feature mapping, site investigations, identification of permit requirements and constraint mapping in support of brushing and other maintenance activities.

TransCanada Bear Creek Rehabilitation

Ontario, Canada

Natural environment component lead for Bear Creek rehabilitation following washout and exposure of the pipeline in the creek bed. Completed baseline existing conditions reporting including fish and fish habitat, SAR and riparian habitat to meet Conservation Authority, MNRF and DFO requirements. Worked with Golder's hydrology team to obtain Conservation Authority permits, develop a rehabilitation plan suitable for the existing conditions and fish community, and recommended appropriate mitigation during construction.

TransCanada Greater Golden Horseshoe Facilities Modifications

Ontario, Canada

Natural environment component lead for an environmental and socio-economic assessment for modifications to a number of facilities under the National Energy Board (NEB). Responsibilities included designing the field program (vegetation, wetlands, wildlife, fish and fish habitat), analysing data, completing the baseline and effects assessment, liaising with agencies and permitting.

**TransCanada Eastern
Mainline Project**
Ontario, Canada

Vegetation and wetland component lead for an environmental and socio-economic assessment for a 392 km new construction pipeline in southern Ontario under the National Energy Board (NEB). Designed the field program, analysed data, completed the baseline and effects assessment and reporting. Consulted and negotiated with the MNRF, Environment and Climate Change Canada (ECCC) and local Conservation Authorities, prepared permit applications, and addressed Information Requests (IRs).

TRAINING

Microsoft Project Level 1 Training
2008

Royal Ontario Museum (ROM) Fish ID Workshop
2005

Introduction and Intermediate MapInfo Professional Training
2000

PROFESSIONAL AFFILIATIONS

Professional Association of Diving Instructors (PADI)

Director, Ontario Stone Sand and Gravel Association (OSSGA) Board of Directors

PUBLICATIONS

**Conference
Proceedings**

Melcher, Heather. 2015. *Bats and the Aggregate Industry*. Ontario Stone Sand and Gravel Association Annual General Meeting, February. Toronto, Canada.

Melcher, Heather. 2014. *Changes to the Ontario Endangered Species Act and Implications to the Aggregate Industry*. Ontario Stone Sand and Gravel Association Annual General Meeting, February. Ottawa, Canada.

Other

Melcher, Heather. 2001; 2002. Effects of Agricultural Inputs of Faecal Coliforms on the Shellfish Industry in Prince Edward Island. Annual Monitoring Report. Prince Edward Island.

Education

*H.B.Sc. (Env) Honours
Environmental Science,
University of Guelph,
Guelph, ON, 2004*

Certifications

*MNRF Ecological Land
Classification - Training
Certificate,
2004*

*MNRF Ontario Wetland
Evaluation System -
Training Certificate,
2005*

*MNRF Butternut Health
Assessor ,
2011*

Languages

English – Fluent

Golder Associates Ltd. – Ottawa

Terrestrial Ecologist

Gwendolyn has been providing ecological consulting services since 2004, with particular knowledge in the field of terrestrial ecology. Supported by her depth of experience, Gwendolyn thrives on anticipating and providing pro-active solutions for clients' needs as they navigate the natural environment approvals process. She is skilled at agency and community liaison, and prides herself on providing creative, efficient and positive outcomes for her clients.

Gwendolyn has authored numerous environmental impact statements, species at risk studies, natural heritage assessments, and due diligence reports for a variety of sectors, including residential development, recreational development, aggregates, energy projects (transmission lines, pipelines and renewable energy), as well as for municipalities, and federal and provincial agencies. She has also provided terrestrial ecology peer review services.

Gwendolyn's expertise is founded on years of direct in-field experience, where she gained extensive skills in identifying and understanding the ecology of Ontario's flora, fauna, and plant communities. Gwendolyn is certified in both the Ministry of Natural Resources and Forestry (MNRF) Ecological Land Classification (ELC) and Wetland Evaluation systems, as well as being an MNRF certified Butternut Health Assessor.

Employment History

Golder Associates Ltd. – Ottawa, ON

Ecologist and Project Manager (2011 to Present)

Gwendolyn is the senior ecologist located in the Ottawa office where she provides a range of terrestrial ecology services, including designing field programs and managing projects for numerous client sectors.

Stantec Consulting Ltd. – Guelph, ON

Ecologist and Project Manager (2004 to 2011)

Gwendolyn provided a range of terrestrial ecology services, including: designing and carrying out detailed field programs; natural features monitoring and species at risk surveys. Gwendolyn was also responsible for managing projects for a range of client sectors.

PROJECT EXPERIENCE – AGGREGATES**Arnott Pit**
Ontario, Canada

Prepared a Natural Environment Level II report for Thomas Cavanagh Construction Ltd. according to the Aggregate Resources Act for an aggregate pit. Work included discussions with the MNRF, field studies, and authoring the final report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans.

Rideau Road Quarry
Ottawa, ON, Canada

Prepared a Natural Environment Level II report for R.W.Tomlinson Ltd. according to the Aggregate Resources Act for a small limestone quarry expansion. Work included discussions with the MNRF, field studies, and authoring the final report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation plans.

Canaan Quarry
Ontario, Canada

Prepared a Natural Environment Level I report for Cornwall Sand and Gravel according to the Aggregate Resources Act for a limestone quarry expansion. Work included a review of all published materials relating to the natural heritage features at the site, undertaking a scoped in-field review of the on-site features, and authoring the final report.

Karson Kennedy Pit
Ontario, Canada

Prepared a Natural Environment Level II report for Karson Aggregates according to the Aggregate Resources Act for a small sand pit project. Work included discussions with the MNRF, designing and undertaking the field studies, and authoring the final report. Integration of various studies by multiple disciplines to determine potential impacts of extraction and preparation of appropriate mitigation and rehabilitation plans. Worked with the Mississippi Valley Conservation Authority to develop an environmental monitoring program.

PROJECT EXPERIENCE – ECOLOGY PEER REVIEW SERVICES**City of Kingston**
Kingston, Ontario,
Canada

Retained by the City of Kingston to provide environmental peer review services. Reviewed an Environmental Impact Study (EIS) for the severance of a parcel of land from the Little Cataraqui Creek Conservation Area, and provided comments with respect to the adequacy of scope and appropriateness of conclusions made in the report.

County of Peterborough
Peterborough, Ontario,
Canada

Retained in 2010 by the County of Peterborough to provide environmental peer review services. Reviewed Environmental Impact Studies (EIS) for residential and recreational developments within the County, and provided comments with respect to the adequacy of scope, and appropriateness of conclusions made in the reports.

County of Frontenac
Frontenac, Ontario,
Canada

Retained in 2008/2009 by the County of Frontenac to provide environmental peer review services. Reviewed Environmental Impact Studies (EIS) for residential and recreational developments within the County, and provided comments with respect to the adequacy of scope, and appropriateness of conclusions made in the reports.

PROJECT EXPERIENCE – ECOLOGY**Former CFB Rockcliffe**
Ottawa, Ontario, Canada

Golder provided multi-disciplinary support to the redevelopment of the former CFB Rockcliffe site to a multi-use urban development. In support of the application to the City of Ottawa by Canada Lands Company, the Natural Environment team prepared the environmental impact statement and the tree conservation report, based on the proposed development plan. The evaluation of natural heritage features for this project site included the integration of provincial and federal regulations and associated best practices for mitigation of potential impacts. Adjacent lands owned by the National Capital Commission were also reviewed as part of this project.

**Capital Region
Resource Recovery
Centre**
Ottawa, ON, Canada

Natural Environment lead for the Environmental Assessment of a new integrated waste management facility. Responsible for obtaining the required approvals from the South Nation Conservation Authority, Fisheries and Oceans Canada, and from the MNRF for species at risk (barn swallow).

**Gatineau Park Trail
Improvements**
Chelsea, QC, Canada

Golder was retained by the National Capital Commission (NCC) to prepare an Ecological Characterization Report in support of proposed trail improvements at Trails 5, 27 and 29 within Gatineau Park (federal lands). Work included mapping of vegetation communities, a fish habitat assessment, and targeted searches for species at risk or their potential habitat along the trails. The final report outlined the existing natural environment and identified mitigation measures to be employed to protect those features from potential negative impacts.

**Champlain Node Park
Improvements**
Ottawa, ON, Canada

Golder was retained by the National Capital Commission (NCC) to prepare an Ecological Characterization Report and Environmental Effects Evaluation (EEE) in support of proposed amenity improvements at the Champlain Node park along the Ottawa River (federal lands). Work included mapping of vegetation communities, a shoreline and fish habitat assessment, a detailed tree inventory and mapping of invasive species, a wetland assessment according to federal guidelines, and targeted botanical and wildlife surveys. The final report outlined the existing natural environment and identified mitigation measures to be employed to protect those features from potential negative impacts.

**Kingston Third
Crossing of the
Cataraqui River**
Kingston, ON, Canada

Golder was part of the team selected by the City of Kingston to assist in preparing the preliminary design for the third crossing bridge over the Cataraqui River. Golder biology worked with a multi-disciplinary team to identify potential natural environment constraints that helped to inform the proposed design. The key natural features in the Study Area included the Cataraqui River Marshes provincially significant wetland, fish habitat in the Cataraqui River, shoreline wetlands and woodlands, and potential habitat for species at risk. Golder biology provided input to the lighting design for the bridge structure that respected the sensitive nature of the area, and also provided input to the landscaping plan that incorporated micro-habitats and native species. The team worked closely with the City of Kingston and Parks Canada.

**Claridge Greenbank
Lands**
Ottawa, ON, Canada

Golder was retained by Claridge Homes to prepare an Environmental Impact Study (EIS) and Tree Conservation report, including all necessary fieldwork, for this Site. Golder worked with the client and the City of Ottawa to address all natural environment issues at the Site, including the potential presence of Species at Risk bats and birds, as well as fish habitat in the Jock River.

**Claridge Maplegrove
Road**
Ottawa, ON, Canada

Golder was retained by Claridge Homes to prepare an Environmental Impact Study (EIS) and Tree Conservation report, including all necessary fieldwork, for this Site. Golder worked with the client and the Ministry of Natural Resources and Forestry to provide solutions that met the clients needs as well as natural heritage policy requirements at the municipal and provincial levels. Species at Risk encountered at the Site included butternut, and the potential for Blanding's turtle which was addressed through the preparation of an Information Gathering Form.

**Claridge Riverside
South Lands**
Ottawa, ON, Canada

Golder designed and undertook a comprehensive field program at the Site to characterize the natural features present. An Environmental Impact Statement (EIS) and Tree Conservation Report (TCR) in support of Claridge Homes' proposed residential development was then prepared which identified mitigation measures to limit potential impacts to the significant natural features identified. Those features included wetlands, headwater drainage features, woodlands, and Species at Risk including butternut.

**Ottawa Police Services
- South Campus**
Ottawa, ON, Canada

Prepared an Environmental Impact Study (EIS) for the proposed South Campus institutional development project. Located adjacent to the Rideau River, the assessment included consideration of a number of Species at Risk, including Blanding's turtle, as well as fish habitat and surface water setbacks.

**Greystone Village -
Former Oblates
Property**
Ottawa, Ontario, Canada

Golder worked with the Regional Group on this exciting redevelopment of the historic Oblates property in Ottawa, along the Rideau River. The site was assessed for natural heritage values, and an Environmental Impact Study and Tree Conservation Report were prepared. Work included liaison with the Rideau Conservation Authority and local community groups.

**Species at Risk
Studies - Various
Projects**
Various Location,
Ontario, Canada

Gwendolyn has been involved in the design and undertaking of numerous studies for various Species At Risk in Ontario, and assessments of their habitats. Surveys followed accepted, standardized protocols and habitats were assessed against established criteria, where available. Species for which these types of studies have been undertaken include, but are not limited to: Fowler's Toad, Western Chorus Frog, Jefferson Salamander, Black Rat Snake, Eastern Hog-nosed Snake, Massasauga Rattlesnake, Short-eared Owl, Barn Swallow, Bobolink, Eastern Meadowlark, Peregrine Falcon, Least Bittern, West Virginia White, American Badger, Little Brown Bat and Northern Myotis, Eastern Foxsnake, Spiny Softshell, Blanding's Turtle, Butternut, American Hart's Tongue Fern, and American Ginseng, Gwendolyn has successfully navigated the over-all benefit permitting process under the Endangered Species Act for butternut and has performed work under the new O.Reg. 242/08 for American Ginseng. Gwendolyn's work with SAR has involved close liaison with the MNR, experts from academia, and involvement of public interest groups such as the Sierra Club of Canada and local Field Naturalist clubs.

**O'Brien House Bat
Maternity Colony
Study**

Gatineau Park, QC,
Canada

Golder was retained to assess the presence or absence of SAR bats using this historic building for maternity roosting. The study included daytime surveys to assess potential habitat and search for evidence of bats, while nighttime surveys focused on visually locating bats exiting the structure, according to standard protocols. Remote acoustic detection units were used to determine species present. Collaborated with the National Capital Commission (NCC), who is the landowner.

**Connaught Range
Turtle Nesting Study**

Ottawa, ON, Canada

Golder was retained by PWGSC to assess current SAR turtle nesting at the Connaught Range, and design a strategy to prevent future nesting, while at the same time offering alternate nesting habitat. Golder's plan was designed in consideration of rigorous shooting range requirements, while offering a safe nesting area for turtles away from the active range.

**Environmental
Management Plan for
Urban Expansion
Lands Areas 9a and 9b**

Ottawa, Ontario, Canada

Prepared an Environmental Management Plan (EMP) for two parcels of land, which included coordination and incorporation of materials from a number of external partners. The EMP provided a framework for future development of the area through a range of detailed studies, and included extensive consultation with City and Conservation Authority staff.

**Brockville Employment
Lands**

Brockville, Ontario,
Canada

Designed a natural heritage study of a 130 acre property in the City of Brockville, with the intention of determining the potentially developable area in consideration of the natural environment features present at the Site, on behalf of the City of Brockville. Results were presented in a preliminary Environmental Impact Study for consideration as part of a Secondary Plan study for the Site.

**Claridge Lands - 4789
Bank Street**

Ottawa, Ontario, Canada

Golder was retained by Claridge Homes to prepare an Environmental Impact Study (EIS) and Tree Conservation report, including all necessary fieldwork, for this Site. Golder worked with the client, City of Ottawa, South Nation Conservation and the Ministry of Natural Resources and Forestry to provide solutions that met the clients needs as well as natural heritage policy requirements at the municipal and provincial levels.

**Remer Lands EIS and
Environmental
Management Plan**

Ottawa, Ontario, Canada

Golder provided natural heritage expertise in assisting the Regional Group to clear conditions for this draft-approved subdivision in Ottawa. This challenging project included a full inventory of the flora and fauna at the site in order to prepare an Environmental Management Plan, Environmental Impact Study and Tree Conservation Report for the site. Golder worked with the client, City of Ottawa, South Nation Conservation and the Ministry of Natural Resources and Forestry to navigate this challenging project and provide solutions that met the clients needs as well as natural heritage policy requirements at the municipal and provincial levels.

Dallan Lands - EIS

Guelph, Ontario, Canada

Prepared an Environmental Impact Study for this proposed residential development. Multi-year field inventories related to flora and fauna were performed, including species at risk (Jefferson Salamander), and wetland boundaries were evaluated in co-operation with the Grand River Conservation Authority. Review of potential impacts was undertaken and presented in an Environmental Impact Statement. On-going consultation with public interest groups, University of Guelph experts, and City staff to develop a design plan in respect of complicated natural heritage features.

University of Waterloo Northwest Campus EIS

Waterloo, Ontario ,
Canada

Undertook a review and assessment of the natural heritage components associated with the subject lands, including floral, faunal and community investigations. The information gathered was used to create an updated Greenspace System on the subject lands and to propose trail linkages between the site and adjacent lands. Reviewed the draft plan of development in relation to the subject lands in order to identify potential environmental effects and recommend mitigation measures.

City of Hamilton Nature Counts Program

Ontario, Canada

Performed ELC within the City of Hamilton's boundary, from Ancaster to Puslinch. Designated Areas of Natural and Scientific Interest (ANSI) were inventoried for flora, fauna and disturbance level, and classified using ELC. Other tasks included air photo interpretation, field navigation and leadership.

TRAINING

Ontario Stream Assessment Protocol (OSAP) - Headwater Drainage Features
Ministry of Natural Resources and Forestry, 2017

Habitat Restoration Planning and Implementation
Northwest Environmental Training Centre, 2014

Wetland Creation Workshop
Toronto Zoo, 2010

MNRF Data Sensitivity Training
Ministry of Natural Resources and Forestry, 2014

St. John's Ambulance First Aid Training
2017

PROFESSIONAL AFFILIATIONS

Ontario Vernal Pool Association

Field Botanists of Ontario



golder.com