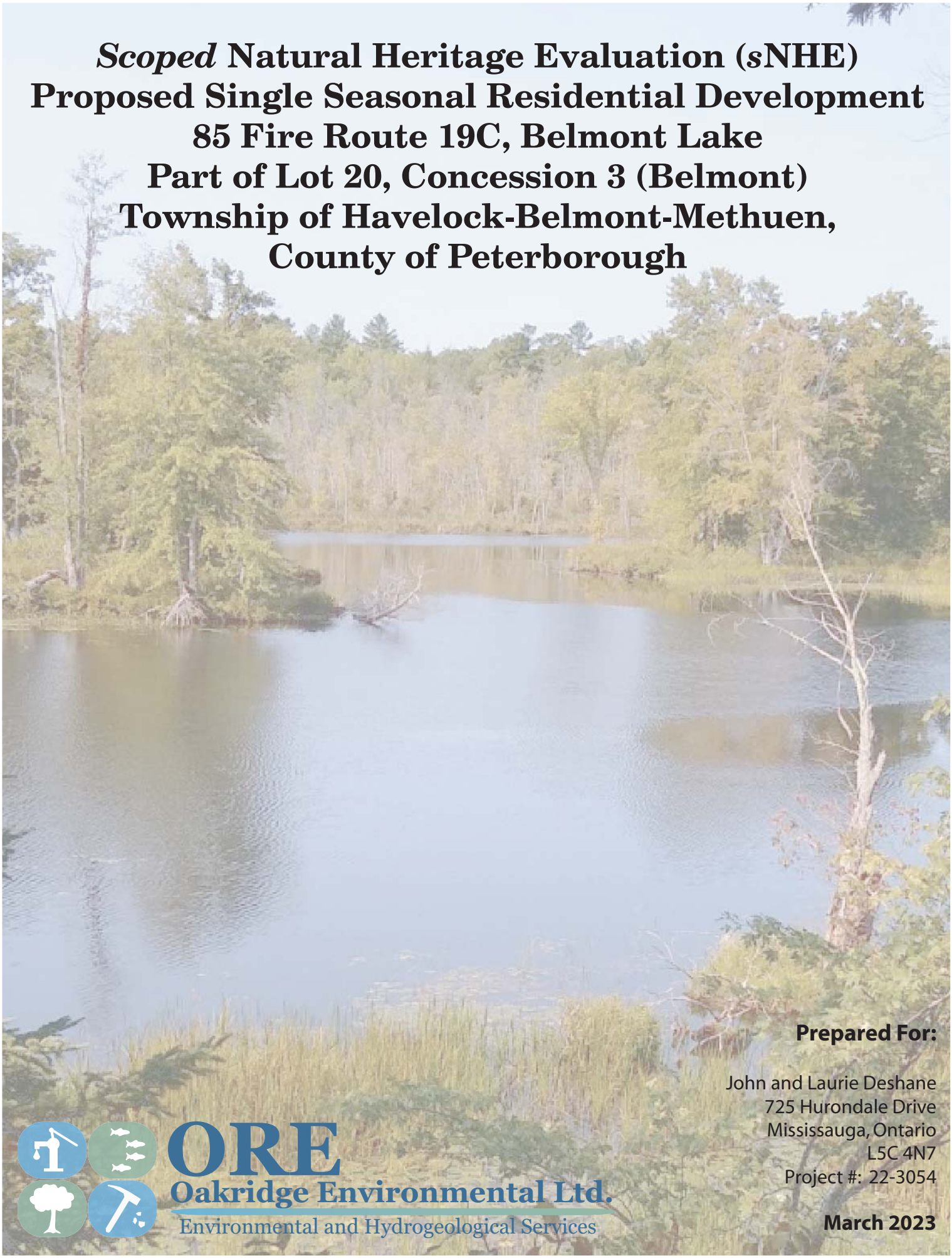
Scoped Natural Heritage Evaluation (*s*NHE)
Proposed Single Seasonal Residential Development
85 Fire Route 19C, Belmont Lake
Part of Lot 20, Concession 3 (Belmont)
Township of Havelock-Belmont-Methuen,
County of Peterborough



Prepared For:

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725 Hurondale Drive
Mississauga, Ontario
L5C 4N7
Project #: 22-3054

March 2023

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

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March 17th, 2023

725 Hurondale Drive
Mississauga, Ontario
L5C 4N7

Attention: John and Laurie Deshane

Re: *Scoped* Natural Heritage Evaluation (*s*NHE)
Proposed Single Seasonal Residential Development
85 Fire Route 19C, Belmont Lake
Part of Lot 20, Concession 3 (Belmont)
Township of Havelock-Belmont-Methuen, County of Peterborough
Our File No. 22-3054

We are pleased to provide this *scoped* Natural Heritage Evaluation (*s*NHE) for the above-referenced property. Our report has been completed in support of your development proposal involving the installation of a new driveway, construction of a single residential dwelling, and installation of private services (well and septic) to service the new dwelling.

Based on our review, the subject site contains unevaluated wetland and is located proximal to two (2) Wildlife Concentration Areas which are discussed in the *s*NHE.

The only upland area on-site accessible from Fire Route 19C occurs as a small ridge feature that juts out between two (2) wetland areas (bottlenecked). Crowe Valley Conservation Authority (CVC) attended the site to delineate the wetland boundary and is willing to permit the construction of a single seasonal residential development outside the defined area. ORE staff attended the site three times to identify the location of the wetland boundary and detect potential Species at Risk and/or their habitat. No Species at Risk were detected on-site and the proposed development can be situated such that it meets ORE's recommended setback/protection area off the unevaluated wetland.

We trust that this report will be sufficient for any agency reviews. Should you have any questions or require clarification, please do not hesitate to contact our office.

Yours truly,

Oakridge Environmental Ltd.

Rob West, HBSc., CSEB
Senior Environmental Scientist

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1.0 Introduction

Oakridge Environmental Ltd. is pleased to present this *scoped* Natural Heritage Evaluation (*s*NHE) in support of your development proposal for a single seasonal residential development located north of Havelock, Ontario.

To support the application, the Conservation Authority has identified the need for a *scoped* study to demonstrate that the development will not result in any impacts to nearby Key Natural Heritage Features (KNHF), Key Hydrologic Features (KHF), or Species at Risk habitat.

The following sections outline our data sources, methodologies, findings and recommendations.

2.0 Site Location and Description

The subject site consists of approximately 22.7 acres (9.2 hectares), situated on the north shore of Belmont Lake (Deer Bay), approximately 17 km north of Havelock, Ontario at 85 Fire Route 19C (Figures 1 and 2). The site has extensive frontage on the north side of Belmont Lake with split zoning of seasonal residential (SR), Rural (Ru) and Environmental Protection (EP), as well as the east side of the Crowe River. The property is accessed from County Road 48, directly off Fire Route 19.

The property is an existing lot of record and is currently vacant. Part of this site was rezoned from Rural to Seasonal Residential in 2012 which involved approval of a Zoning By-Law Amendment by Township of Havelock-Belmont-Methuen Council (HBM). Existing residences and vacant lands are present on the surrounding properties.

3.0 Proposed Development / Site Alteration

It is understood that the proponent would like to construct a single seasonal residential dwelling in the north central portion of the property. The proposed development will be located within the portion zoned as Seasonal Residential. The lot will be privately serviced for water and sewage, it is possible these services could be located within the Rural zoned portion of the property (according to HBM staff).

The concept plan for the development will be prepared, based on the results of this study.

4.0 Crowe Valley Conservation Authority

It is understood that the property is regulated by Crowe Valley Conservation Authority (CVC), and that obtaining a Permit will be required by CVC, and /or the hearing in front of CVC's Watershed Advisory Board. This report has been prepared at the CVC's request. If CVC approves the proposed development, the proponents will apply to HBM for the required Building Permits.

ORE staff met with CVC staff on-site on May 25th, 2022 to review the location of the wetland on the property. Miller Surveying staff members were also present to stake the wetland boundary and tie the location data into the Site Plan (Appendix A). The wetland boundary survey data were forwarded to CVC for their review and overlay on a map of the subject property

5.0 Physical Setting

5.1 Topography and Drainage

As illustrated by Figure 2, the subject property has extensive frontage on the north shore of Belmont Lake (Deer Bay) and Crowe River. The southernmost part of the site contains areas of unevaluated wetlands, associated with the lakeshore. The site exhibits only about 2.5 m of topographic relief, as measured from the highest elevation in the north to the lake level. This is likely related to the site occurring in a poorly defined, ancient alluvial plane associated with the river. Other than a small pond adjacent to Fire Route 19C along the site's northern boundary and the lake, there are no mapped watercourses within the property.

Although the site occurs within the Canadian Shield, it lacks the steep linear topographic ridge outcrops and troughs that typically occur in this type of terrain. Instead, the outcrop ridges are fairly subdued in terms of relief. The combination of flat topography, wetlands and low elevation (above the lake) suggests the potential for a shallow water table condition.

5.2 Geological Setting

As illustrated by Figure 3, the surficial geology of the subject site is dominated by deposits that largely consist of sand and silt till that mantle the Precambrian bedrock. These are referred to as the Precambrian bedrock drift complex. These soils tend to be thin and occur in pockets (i.e., between outcrops), often with an upper layer of oxidized silty fine sand derived from weathering of the till (or bedrock), and/or remnant glacial outwash.

In the lower-lying areas (where the lacustrine wetlands occur), the surficial soils are

likely composed of organic muck with an alluvial substrate. The mapping indicates that there are coarse granular soils occurring north of the site, consisting of ice-contact (e.g., kame) deposits, suggesting that other glacial deposits could also occur in the area.

Although not illustrated on the mapping of Figure 3, other published geological maps indicate that the site contains numerous bedrock outcrops exposing calcitic marble (i.e., metamorphosed limestone), occupying the majority of the site. On either side of the marble, outcrops of magnetite-rich mafic metavolcanic rocks occur (i.e., along the river and the lakeshore). The presence of marble could be relevant to the vegetation communities, especially if the marble has contributed to the soil composition.

It is not possible to determine soil thickness from the published mapping. However, by perusing the Ministry of the Environment, Conservation and Parks (MECP) well record database for the site area, we note that nearby well No. 5117793 encountered 0.6 m of "brown soil" overlying fractured rock described as black shale and grey limestone, likely being the marble. In contrast, nearby well No. 5107914 encountered 0.9 m of sand and gravel above the "granite" bedrock. As such, it is clear that soil cover above the bedrock is highly variable.

6.0 Background Data

6.1 Natural Heritage Information Centre (NHIC)

The NHIC provides an online database managed by the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF). Within the database, Ontario has been divided into a grid consisting of 1 km^2 areas or regional squares, each given a unique identifier. The squares can be searched for species of conservation concern, plant communities, wildlife concentration areas and natural areas.

The property falls within two (2) of the 1 km^2 squares: 18TQ7534 and 18TQ7634

The query indicates that one (1) Wildlife Concentration Area is recorded in the area:

Wildlife Concentration Areas:

Mixed Wader Nesting Colony - Mixed Wader Nesting Colonies are comprised of congregrating nesting wading bird species (gulls, terns, herons, egrets, plovers, sandpipers, etc.) this wildlife area is approximately 500 m east of the subject site according to the NHIC - Natural Heritage Areas Make a Map Feature website.

A Stratum 1 (Deer Yard) occurs approximately 50 m south of the subject property with a Stratum 2 (Deer Wintering Area) adjacent to the Stratum 1. The Stratum 1 SWH is the most proximal to the subject property. Both areas occur across the Crowe River

(southwest side). The locations are provided by the NHIC - Natural Heritage Areas Make a Map Feature website.

The query indicates that seven (7) Species at Risk (SAR) have been recorded in the area:

Common Name	**Scientific Name**	**SAR Status**
Bobolink	*Dolichonyx oryzivorus*	Threatened
Eastern Meadowlark	*Sturnella magna*	Threatened
Eastern Musk Turtle	*Sternotherus odoratus*	Special Concern
Eastern Ribbonsnake	*Thamnophis sauritus*	Special Concern
Midland Painted Turtle	*Chrysemys picta marginata*	Special Concern*
Western Chorus Frog**	*Pseudacris maculata pop. 1*	NAR***
Wood Thrush	*Hylocichla mustelina*	Special Concern

*COSEWIC status only
**Great Lakes - St. Lawrence - Canadian Shield population
***SARO status - Threatened under SARA and COSEWIC

The query indicates that one (1) species of note (not SAR or S-Ranked but tracked by the NHIC) has been recorded in the area:

Common Name	**Scientific Name**
Greater Redhorse	*Moxostoma valenciennesi*

Brief descriptions of the above species and their preferred habitats are included in Appendix B. Our site inspections included targeted searches for potential SAR habitat of these species. An excerpt from the NHIC's website illustrating the location of the squares relative to the subject site is also included in Appendix C.

6.2 Ontario Breeding Bird Atlas (OBBA)

The OBBA[1] provides up-to-date reliable information on birds within Ontario. The information includes species descriptions, habitats, range, documented sightings, etc. The subject site occurs within the 10 km^2 area mapped as 18TTQ73, Region 16, Peterborough. The Summary Sheets for this atlas area are provided in Appendix D.

From our review of the information, significant breeding species that could potentially be associated with habitats in the site area include the following:

[1] managed by Bird Studies Canada.

Common Name	**Scientific Name**	**SARO Status**
Barn Swallow	*Hirundo rustica*	Threatened
Bobolink	*Dolichonyx oryzivorus*	Threatened
Canada Warbler	*Cardellina canadensis*	Special Concern
Common Nighthawk	*Chordeiles minor*	Special Concern
Eastern Meadowlark	*Sturnella magna*	Threatened
Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened
Eastern Wood-Pewee	*Contopus virens*	Special Concern
Golden-winged Warbler	*Vermivora chrysoptera*	Special Concern
Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern
Wood Thrush	*Hylocichla mustelina*	Special Concern

Brief descriptions of the listed species and their preferred habitats are included in Appendix B. The site inspections included a review of potential SAR habitat and targeted searches for the listed species.

6.3 eBird

eBird is a citizen science database, whereby birding individuals can attend public areas referred to as "hotspots" and list species of bird they detect each time they visit the hotspot location. According to the eBird Geographic Information System (GIS) database, the nearest hotspot is located over 7 km east of the site. The data for this location are not relevant to the subject site.

6.4 iNaturalist

The iNaturalist database provides a geographical site map which contains individual species occurrences. The NHIC version of the iNaturalist database is specific to those species tracked by the NHIC. These include SAR as per those identified in the Species at Risk Ontario website and also provincially rare species that the NHIC tracks in their records. The occurrence data includes the professional/surveyors name, confirmation identification by other professionals, occurrence photos, and the date the rare species was observed. The search extent is an approximate 2 km^2 area centred on the site.

The iNaturalist database was reviewed to determine if any SAR sightings have occurred either on, or within the vicinity of the subject site. No records were reported for the subject site or adjacent lands.

7.0 Inspection Methodologies

7.1 Vegetation

The site has been characterized by its various vegetation communities using the methodologies included in the *Ecological Land Classification (ELC) - First Approximation and Its Applications* (1998). The classification of each vegetation community has been designated in accordance with the Ecological Land Classification for Southern Ontario (FG-02), 1998. Where the 1998 ELC does not adequately identify the vegetation community, the 2008 Draft ELC is then applied.

Prior to conducting the site inspection, aerial photography of the subject site was reviewed to roughly delineate communities based on recognizable vegetation differences. The assemblage of plant species were subsequently inspected in each identified community and the vegetation types confirmed. In some cases, the dominant vegetation types were recorded and boundaries of any sensitive communities were mapped using a differential GPS.

Any wetland-type vegetation communities were investigated from the perspective of whether they are hydrologically sensitive and/or whether they may contain a Species at Risk.

7.2 Avifauna

ORE staff attended the site once during the peak breeding bird season, and endeavoured to detect all available avian species by sight, calls and notes, within and proximal to the site. Bird calling devices and "pishing and squeaking" were periodically used to attract bird species from within the more densely vegetated areas to an opening or the edge of the property. ORE staff also used the I-Bird Pro app on a cellular phone to broadcast calls of potential SAR avian that could occur within the property. Broadcasting the call of the SAR may illicit a call-back from the species and/or entice it to come within range to observe it, if they are still present in late summer period.

All species overheard or observed during the survey were recorded.

7.3 Mammals

Mammals were detected utilizing the protocols outlined in the MNDMNRF's March 1998 - Wildlife Monitoring Programs and Inventory Techniques for Ontario. Mammals were generally identified by either visual encounters or via their tracks and/or scat droppings at the site.

Surveys were conducted specifically in areas where tracks could be identified such as the edge of the wetlands/creek corridors and after precipitation events on-site, where

fresh tracks could easily be observed in mud.

7.4 Herptiles

The protocol employed for detection of herptiles followed MNDMNRF's March 1998 - Wildlife Monitoring Programs and Inventory Techniques for Ontario. Furthermore, the December 2016 Survey Protocol for Ontario's Species at Risk Snakes was also implemented.

During the inspection, visual encounter surveys were conducted while searching through brush piles, rolled over lumber/boards/metal sheets (artificial cover) and dead-fall within the woodland habitats to determine whether any significant species of herptile could be detected. The visual encounter surveys extended to Fire Routes 19 and 19C to identify dead-on-road herptiles.

8.0 Site Inspection Data

8.1 Site Inspections

ORE staff attended the site to observe fauna and determine the vegetation communities, as indicated below.

Date of Inspection	**Temp. ^{o}C**	**Beaufort (Wind) Scale**	**Conditions Reason for Inspections**
May 25, 2022 4:30 AM to 3 PM	24	2 - Gentle Breeze	80% overcast. Warm humid day. Breeding bird survey. Observe vegetation/existing site conditions, ELC mapping, wetland mapping with CVC, species inventories, SAR habitat review.
September 7, 2022 8 AM to 1 PM	17	1 - Light Air	Clear. ELC mapping and species inventories.
October 4, 2022 10 AM to 3 PM	12	1 - Light Air	Clear. Relatively warm day in October. Species inventories, ELC mapping, wetland mapping, SAR habitat review.

Appendix E contains the list of species identified on the property during our inspection.

8.2 Ecological Land Classification (ELC)

Based on our site observations, we have determined that there are three (3) upland communities/habitats and five (5) wetland/aquatic communities located on-site. It should be noted that the wetland boundary provided by the Land Information Ontario (LIO) was incorrectly mapped in the area of the proposed development. ORE and CVC staff delineated the boundary of the on-site wetland habitats according to the Ontario Wetland Evaluation criteria and the corrected boundary is illustrated on Figure 4. ORE notes that CVC "connected the dots" via the survey information that was provided during the on-site wetland mapping, however, the area where the new road is proposed did not contain wetland and was a dry upland ridge feature on-site.

Figure 4 illustrates the distribution of the on-site vegetation communities. The vegetation types were determined as per the Ecological Land Classification for Southern Ontario (FG-02), 1998 and when necessary the draft 2008 ELC when the proper community was not defined in the 1998 ELC. These habitats and their associated vegetation and environmental sensitivities are characterized below.

Representative photos of these communities are provided in Figure 5. Descriptions of the communities are provided below.

Upland Community:

1. Dry - Fresh White Cedar Mixed Forest Ecosite (FOM4)

The Dry - Fresh White Cedar Mixed Forest (FOM4) will be dominated entirely by Eastern White Cedar (*Thuja occidentalis*) and a minor fraction of deciduous species. This ecosite will have a Dry (0) to Fresh (1, 2, 3) soil moisture regime.

This cedar dominated habitat occurs around the edge of the peninsula, between the deciduous upland area and the unevaluated wetland boundary. Very few species can survive beneath the cedar dominated woodland, therefore, the herbaceous cover is low.

The proposed seasonal single residential development may occur within this upland woodland habitat.

2. Dry – Fresh White Pine – Hardwood Mixed Forest (FOM2)

According to the ELC, this community possesses a dry to moderately fresh regime with shallow soils over bedrock, sands and course loams. It is well drained due to the sandy soils which result in dry conditions in these upper to middle slope and tableland type habitats. The ELC also states that the dominant species are White Pine (*Pinus strobus*), Sugar Maple (*Acer saccharum)*, Red Oak (*Quercus rubra*) and to a lesser extent White Oak (*Quercus alba*).

The FOM2 community occurs in the northeastern portion of the subject property. It is an upland woodland community comprised of Sugar Maple, Oaks and White Pine, and is the most abundant upland woodland type in the area. This type of woodland occurs atop the ridge and bedrock dominated features. Bedrock may occur at surface within these communities as small inclusions in the forest stand.

As no portion of the development is proposed to occur in this community, it will remain unchanged and natural.

3. Fresh - Moist White Cedar - Hardwood Mixed Forest (FOM7)

According to the ELC manual, a Fresh - Moist White Cedar Hardwood Mixed Forest (FOM7) possesses 60% or more canopy cover consisting of at least 25% conifer species and at least 25% deciduous species. FOM7-1 is dominated by Eastern White Cedar *(Thuja occidentalis*) and Sugar Maple (*Acer saccharum*), with Trembling Aspen (*Populus tremuloides*), Paper Birch (*Betula papyrifera*), Balsam Poplar (*Populus balsamifera*) and Red Maple (*Acer rubra*) associates, although additional species may be present. The soils tend to be on the moist end of the moisture regime gradient.

The majority of this woodland community occurs atop the ridge feature (above the flood plain of Deer Bay/Belmont Lake) and is the dominant upland community on the property.

The same type of woodland habitat occurs within an upland island area dominated by a bedrock knob feature, in the southern portion of the site. This elevated upland area is surrounded by the Deer Bay to the east, the on-site wetlands to the north and south, and Crowe River to the west.

As no portion of the development is proposed to occur in this community, it will remain unchanged and natural.

Wetland Communities:

4. Maple Mineral Deciduous Swamp (SWD3)

The ELC states that the Maple Mineral Deciduous Swamp community must possess greater than 25% tree and shrub cover, and be dominated by hydrophytic species. The swamp could undergo seasonal variability with respect to flooding (< 2 m deep), vernal ponding and short aeration periods in the mid-summer period.

This Silver Maple dominated swamp community occurs around the edge of the peninsula, between the upland cedar slopes and the shoreline wetland habitats described below. This type of wooded swamp is the latest community in the succession of swamps. The herbaceous cover is typically high, with an abundance of ferns, sedges and reeds.

No part of the proposed single seasonal residential development footprint will be allowed within this community. However, the proponent may clear/trim vegetation to create a narrow passage/passive use trail through this community to access the waterfront area, as indicated in Figure 6.

5. Speckled Alder Mineral Deciduous Thicket Swamp Type (SWT2-1)

According to the ELC, a SWT2-1 community must contain greater than 25% tree and shrub cover, and be dominated by hydrophytic tree and shrub species. It can experience variable flooding regimes and would possess 20% or more vernal pooling. During the drought periods in the late summer, the vernal pools can be dry.

This community occurs around the edge of the peninsula (in certain areas) and typically between the SWD3 community and the OAO (discussed below). The thicket swamp in this area is dominated by Speckled Alder (*Alnus incana*) with minor occurrences of Gray Dogwood (*Cornus racemosa*) and Red-Osier Dogwood (*Cornus sericea*).

As no portion of the development is proposed to occur in this community, it will remain unchanged and natural.

6. White Cedar – Hardwood Mineral Mixed Swamp Type (SWM1-1)

The ELC describes a White Cedar - Hardwood Mineral Mixed Swamp (SWM1-1) as having tree cover present in greater than 25% of the ecosite, with a relatively even mix of deciduous and coniferous species. This ecosite is dominated by Eastern White Cedar (*Thuja occidentalis)* and Hardwood species such as Trembling Aspen (*Populus tremuloides*), White Birch (*Betula papyrifera*), Green Ash (*Fraxinus pennsylvanica*), Black Ash (*Fraxinus nigra*), among others. A typically fern-rich ground cover will be subject to variable flooding regimes.

The SWM1-1 habitat occurs between the SWD3 community and MAS/SWT community described below. It occurs in the southern portion of the property and is a transition zone between the communities mentioned above.

No part of the proposed single seasonal residential development footprint will be allowed within this community. However, the proponent may clear/trim vegetation to create a narrow passage/passive use trail through this community to access the waterfront area, as indicated in Figure 6.

7. Shallow Marsh (MAS) and Thicket Swamp (SWT)

The MAS and SWT communities persist due to variable flooding regimes and water depths up to 2 m. These zones have mineral and organic substrates, are seasonally

flooded and can either represent the core or terrestrial interface area within a wetland.

This community occurs between the FOM4 and the lakeshore, and is the dominate community along the lake interface, whereby the MAS species occur within the openings of the SWT species. The reedy species occur within a patchy mosaic of openings and are part of the thicket swamp habitat. This community is typically the type of wetland vegetation that occurs directly at the shoreline and transitions to the open water habitat. The description of the open water habitat follows.

As no portion of the development is proposed to occur in this community, it will remain unchanged and natural.

8. Open Aquatic (OAO)

The ELC (2008) describes OAO as an environment containing no macrophyte vegetation and no tree or shrub cover. This ecosite tends to be dominated by plankton and has a lake trophic status.

Deer Bay is a relatively shallow area within Belmont Lake. There is some minor aquatic vegetation along the edge of this community, however, it transitions to an open aquatic environment within a few metres of the shoreline.

No part of the proposed single seasonal residential development footprint will be allowed within this community, other than if the proponent seeks approvals to construct a dock system along the shoreline.

8.3 Fauna and Flora

Fauna

According to our screening of SAR databases, the following SAR fauna are potential candidates to be either on or proximal to the site during the construction phase:

NHIC Database SAR:

Species at Risk	**Habitat Preference and Presence/Absence On-Site**
Bobolink	Prefers farmfield habitat which is not present on-site.
Eastern Meadowlark	Prefers farmfield habitat which is not present on-site.
Eastern Musk Turtle	Could occur within Deer Bay/Belmont Lake but was not detected on-site during the inspection dates, nor were there any roadside nests.

Eastern Ribbonsnake	Typically occurs within marshy areas surrounded by thicket; the combination of marsh and thicket habitats is not present on-site. Not detected during the surveys.
Midland Painted Turtle	Could occur within Deer Bay/Belmont Lake but was not detected on-site during the inspection dates, nor were there any roadside nests.
Western Chorus Frog	Could occur within the unevaluated wetland, but not detected on-site.
Wood Thrush	Prefers secondary succession woodlands which is present on-site. Not detected during the site inspections.
Greater Redhorse	Deer Bay/Belmont Lake may possess good quality habitat for this fish species. The shoreline areas associated with the subject site are mucky, whereby this species prefers hardened/bedrock surfaces with sands and gravels. Not identified during the surveys.

None of the SAR in the NHIC database were detected on-site.

OBBA Database SAR:

Species at Risk	**Habitat Preference and Presence/Absence On-Site**
Barn Swallow	Prefers farm properties and/or residences next to waterways, habitat not present on-site.
Bobolink	Discussed above.
Canada Warbler	Prefers coniferous stands next to flowing creeks and rivers; habitat present off-site to the west.
Common Nighthawk	Prefers scrubby rock barren habitats, small area of habitat present on the upland island.
Eastern Meadowlark	Discussed above.
Eastern Whip-poor-will	Prefers large woodland tracts, habitat present on-site and on neighbouring parcels.
Eastern Wood-Pewee	Prefers large woodland tracts, habitat present on-site and on neighbouring parcels.
Golden-winged Warbler	Prefers willow scrub in wetland edge, habitat present, along the lakeshore, but not detected during the surveys.
Grasshopper Sparrow	Farm fields similar to Eastern Meadowlark and Bobolink, habitat not present,
Wood Thrush	Discussed above.

None of the SAR in the OBBA database were detected on-site.

eBird Database SAR:

No hotspots were identified proximal to the subject site.

iNaturalist Database SAR:

No records were identified within a 2 km radius of the subject site.

Among those SAR listed within the databases, none were detected within the area where the proposed single seasonal residential development is proposed. Some of the avian SAR could be associated with the unevaluated wetland/lake and the upland woodland habitats on the property. The remaining species appear to occur within the local farm properties in the area. The subject site does not possess field or farm type habitats. The only potential SAR in the lists above that could be present in the unevaluated wetland in the spring season would be the Midland Painted Turtle and Eastern Musk Turtle. As for the upland wooded areas, Eastern Whip-poor-will, Eastern Wood-Pewee and Wood Thrush are potential candidates.

Provided measures are implemented to prevent the SAR turtles from entering the development areas during the construction period, these species should be able to coexist with the proposed development. Similarly, provided measures are implemented on-site to retain as much of the upland woodland on-site, the woodland related SAR avian should also be able to coexist with a single residential development.

The fauna species observed on-site are listed in Appendix E. None are considered to be SAR.

Flora

No SAR flora was detected during the database queries. The only SAR flora that could potentially occur on-site would be Butternut. Butternut is an Endangered tree species due to the canker disease that is culling this tree. ORE staff completed targeted surveys for Butternut and did not identify this tree within the upland areas of the site. The tree may occur at the edge of wetlands, however, does not occur directly within wetland habitats. As such, it would not be present within the unevaluated wetland.

No mitigation is necessary to protect/preserve any SAR flora on-site.

9.0 Impact Assessment and Mitigation

9.1 General Considerations

Based on our assessment, it is our opinion that potential impacts related to future development of the site could include the following:

1) Potential degradation/alteration/clearing of the upland woodland vegetation communities that could impact the on-site downgradient unevaluated wetland on-site, resulting in sedimentation and water quality deterioration.

2) Potential impacts related to construction activities (e.g., vegetation removal, etc.), including denuding of vegetation to prepare the site for construction or from track/tire equipment grading of the surface (with specific reference to migratory breeding birds).

3) Potential impacts related to post-construction occupation and stabilizing of bare or disturbed/altered surficial soils.

4) The subject site occurs approximately 500 m (or less) to a Mixed Wader Nesting Colony. There is also a Stratum 1 (Deer Yard) approximately 50 m south of the subject site, across the other side of the Crowe River and Stratum 2 Deer Wintering Area adjacent the Stratum 1. Potential impacts should be addressed regarding these Wildlife Concentration Areas.

5) Potential to impact SAR fauna, identified within the SAR pre-screening. Although no SAR were detected during the survey, there is a small probability that a SAR bird or turtle could be in the area during construction, considering the proximity of the unevaluated wetland, Deer Bay/Belmont Lake and the woodlands on-site. Therefore, construction mitigation should include measures that allow construction to proceed while being cognisant of the potential for these SAR fauna to occur in the area.

These general impact considerations are further discussed in the following sections.

9.2 Development Envelope

9.2.1 Development Constraints

Our field investigations have confirmed that the main concern with respect to any new residential construction is the location relative to the unevaluated wetland/KHF (as illustrated on Figure 6). The vegetation removal and disturbance of the area intended for the new residential development could result in a moderately large area of bare soils being exposed adjacent to the unevaluated wetland. ORE staff anticipates that excavations will be necessary in this area to construct the new foundation for the

structure. However, it is expected that the majority of these disturbed areas can be contained within the upland areas by applying industry-standard construction protocols.

Overall, the gradient on the property is radial, toward the unevaluated wetland that surrounds the upland building envelope. As such, on-site runoff would flow toward the wetland. Mitigating potential impacts associated with those flows should be managed prior to the wetland boundary during the construction and post construction phase.

It is anticipated that the proposed residential development will occur entirely within the central portion of the lot, displacing the upland woodland habitat area on the property. ORE staff routed the proposed road access and building envelope in areas where an existing trail opening and minor opening already occurs within the forest.

To ensure the proposed residential development does not impose upon the wetland or area directly upgradient of the wetland, ORE has applied a 6 m Vegetation Protection Zone (VPZ) to the wetland boundary identified by ORE and CVC staff (and then finely tuned by ORE to include the upland ridge/peninsula feature). Typically, a 15 m setback is the minimum required by most Conservation Authorities. However, applying a 15 m setback situates the building envelope outside the Seasonal Residential Zoned area on the subject site that was established during the rezoning exercise in 2012.

ORE staff were instructed by Mr. Bryce Sharpe (the proponents Registered Professional Planner - RPP) that the building envelope must occur within the Seasonal Residential designated area to comply with the Township's requirements. Therefore, the 6 m setback allows for a moderate-sized building envelope to occur within the Seasonal Residential designated area while being a reasonable distance back from the unevaluated wetland. It was determined by the proponent's RPP through an inquiry with HBM staff that the private services (well and septic) can be located within the Rural zoned portion of the property, without contravening zoning requirements. However, the dwelling must be located withing the Seasonal Residential zoned area on-site.

The 6 m VPZ is meant to prevent machinery from entering this buffer and prohibit grading, stockpiling of fill, or removal of vegetation within the VPZ or KHF. Considering the gradient is toward the wetland, the 6 m VPZ will also provide a buffer for runoff. Therefore, by restricting all work on the property to outside the 6 m VPZ, the wetlands/waterways will be protected. Furthermore, the identified building envelope within the Seasonal Residential zoned area is a modest size (approximately 0.25 acres), of which only the dwelling has to be located within.

ORE staff notes that the location of the private services would have to be identified within the building envelope and meet the Building Code and well construction requirements. Typically, the subsurface drainage mimics the surface drainage. Therefore, the proposed septic system location should be as far back from the wetland boundary as possible, achieving the greatest distance possible to the KHF.

Recommendations are provided in a following section for mitigation of potential impacts on the watercourse features.

9.2.2 Wetland Boundary Adjustment

ORE staff notes that the CVC wetland boundary appears to include wetland along the entire northern limit of the site, whereas, ORE staff's mapping removes the wetland mapped areas as it was determined to be an upland area that extends directly off of Fire Route 19C. The upland area occurs as ridge-like peninsula out into the wetland mapped areas on either side of the ridge feature.

Therefore, the proposed laneway, dwelling and private services can occur within the upland ridge-like peninsula on the property as illustrated on Figure 6.

9.3 Construction Related Impacts

The main potential impacts associated with construction activities could include the following:

1. loss of vegetation (i.e., primarily removal of trees and shrubs in the upland woodland on the subject property);

2. erosion and sediment generated by exposed and/or disturbed soils during excavation and grading activities to construct the building(s) on-site;

3. operation of equipment that disturbs/destabilizes the ground surface beyond the footprint of the excavated/disturbed areas for the building footprint(s);

4. presence of construction debris and waste materials;

5. wildlife entering the work area, drawn to fill materials and exposed sandy/gravelly materials (i.e., possibly turtle SAR);

6. cleanliness of machinery utilized to prepare the site for construction;

7. permanent stabilization of the construction area in the post construction era, and

8. sensitivity of the site with respect to imported fill materials and stockpiling of these materials during construction.

Recommendations are provided below to ensure that the potential for impacts relating to occupation and use of the new residential development are minimized.

10.0 Conclusions & Recommendations

10.1 Development Envelopes and Constraints

- It is recommended that the limit of the allowable *disturbance area* be defined by the 6 m Vegetation Protection Zone (VPZ) illustrated on Figure 6. The predominant sensitive/Key Hydrologic Feature is the unevaluated wetland, which surrounds the only upland area on the subject property. The wetland surrounding the upland area creates somewhat of a peninsula of upland, which is the only potential development area on the parcel. In addition to this physical constraint, ORE staff was instructed by the proponent's RPP that the building envelope must be located in the Seasonal Residential designated area. This constraint forces the proposed development to the southern portion of the upland peninsula.

  By applying a 6 m VPZ off of the ORE/CVC-delineated wetland boundary, a suitable building envelope is available that will completely contain the works outside of the VPZ and within the Seasonal Residential designated area. According to CVC, their minimum setback/VPZ for non-evaluated wetlands that are less than 2 ha is 15 m. Unfortunately, maintaining a 15 m setback or greater (which is preferred) is not possible on this existing lot of record. Applying a (typical) 15 m setback for the VPZ would be an onerous constraint with regard to the building envelope in this instance. Therefore, the authorities will need to allow the 6 m VPZ in order for the property owner to build a cottage on this property, while respecting the zoning.

  Provided the proponents are mindful of the constraints, the proposed development should meet both the zoning and natural heritage feature restrictions/constraints on the subject property.

- ORE staff have outlined an approximate area of almost 0.25 acres, which is sufficient to construct a seasonal residential dwelling and private services. If the proponent wants to construct a larger cottage, they would have to construct the dwelling higher to achieve the overall desired floor space/square footage. This site is not conducive to constructing a large garage, shop or accessory sleeping accommodation (eg. a bunkie). These concessions are necessary to minimize the overall footprint within a site that is highly sensitive and has a (proposed) reduced setback/VPZ of 6 m.

- It is ORE's opinion, the residential development can be constructed outside the 6 m VPZ without impacting the nearby unevaluated wetland feature that surrounds the upland peninsula, while maintaining the residence and private services within the confines of the existing zoning and related provisions on the

property (Figure 6).

- Both the roadway and the proposed building envelope are situated to take advantage of an existing trail alignment and a minor opening within the woodland canopy. By situating the development within these areas, tree loss will be minimized. No tree plantings or compensatory measures are necessary, as the site is completely natural and no additional existing disturbed/altered areas occur on the subject site that could be enhanced with plantings.

- To ensure construction activities are confined within the disturbance limit identified on the Site Plan, the 6 m VPZ should be demarcated on-site by installing a heavy-duty silt fence along this boundary, similar to what is illustrated by Figure 6. The 6 m VPZ limit should also be illustrated on the Site Plan once the proposed residential development details are defined.

  The 6 m VPZ development limitation will prevent the construction crew from unnecessarily increasing the overall disturbance footprint toward the on-site unevaluated wetland. The heavy-duty silt fencing will also ensure that any loose/unconsolidated materials will not migrate beyond this limit, thereby protecting the unevaluated wetland/KHF. The silt fence must be installed prior to any alterations or disturbances occurring on the subject site, including any vegetation removal.

- As there is also a potential for SAR turtles to occur within the wetland and Deer Bay/Belmont Lake (e.g., Eastern Musk Turtle, Midland Painted Turtle, etc.), the heavy-duty silt fence will serve as a turtle exclusion fence, as recommended by the Ministry of Northern Development Mines, Natural Resources and Forestry (MNDMNRF). The fence will prevent turtles from entering the site and laying their eggs in the loose unconsolidated materials of the construction area.

  Light-duty silt fence <u>is not</u> considered an exclusion fence material, and the property owner should insist on heavy-duty silt fence. Light-duty silt fence could be installed, only if the residential development is to be constructed outside the period turtles are active (i.e., prior to April 15th and after October 31st, each year).

- A Stratum 1 (Deer Yard) and Stratum 2 (Deer Wintering Area) Significant Wildlife Habitat (SWH) occurs approximately 50 m south of the subject site, across the west side of the Crowe River. Considering there is a major waterway (Crowe River) between the proposed seasonal single residential development and the deer SWH, impacts are not anticipated.

  It is possible that deer may cross along the lakefront to access this habitat during

the winter period. Therefore, no impacts are likely due to the presence of a seasonal residence in its proposed location, as the proponent is unlikely to frequent the dwelling during the winter period. Furthermore, both the zoning and wetland setback requirements forces the development envelope further north of the lakeshore, which is also favourable to any overwintering deer. No recommendations are necessary with respect to retaining the off-site Stratum 1 and Stratum 2 deer SWH.

- According to the NHIC, there is a Mixed Wader Nesting Colony within 500 m of the site. The colony occurs east of the subject site and is likely associated with a treed swamp/marsh or open water type habitats. The mixed waders could nest in dead trees and/or within the reed/cattail marsh habitats within this wildlife concentration area.

  The unevaluated wetland on-site does not possess the reed/cattail marsh habitat that Mixed Waders prefer; it does possess wooded swamp, however, there are very few dead trees within this feature. The colonies also prefer standing water in and around the nesting areas to prevent predators from accessing the nests. The wooded swamp habitat associated with the subject site did not have standing water. Therefore, the wading avian would choose not to locate their nests in the wetland habitat on the subject site. Moreover, the distance to this feature should be sufficient to mitigate impacts by the proposed single residential development in any case. Therefore, no recommendations are required with respect to mitigation for the Mixed Wader Nesting Colony habitat.

- The contractor and/or owner shall be responsible for keeping Fire Route 19C free of mud/soil deposits. The contractor and/or property owner shall scrape/remove any/all soil materials deposited on the road by machinery which may impair this privately maintained road. The machinery must also be cleaned according to the provincial protocols to prevent transportation of invasive/exotic species to and from the subject site. The contractor/property owner can review the protocol at the website address below:

  https://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/Clean-Equipment-Protocol_June2016_D3_WEB-1.pdf

- The proponent should be allowed to construct an approximately 2 m wide trail south towards the waterfront to access Deer Bay. An upland island area occurs in the southern portion of the site whereby a passive use trail could be constructed to cross the wooded swamp habitats and access the upland island. The proponent should include structures such as boardwalks to cross the wetland between the proposed building envelope and the island, in the proposed building sketches/survey.

- Grass seed and/or sod should also be applied to any exposed/bare soils resulting from site preparation and construction activities. The seed/sod mix areas should be included on the proponent's sketch drawing. The Township of HBM and/or the CVC should approve the type of stock being proposed at the Building Permit and CVC Permit stage.

10.2 General Design Considerations

- The final design/layout plan for the new seasonal residential development should demonstrate that all of the development can be completed outside the 6 m VPZ limit as illustrated on Figure 6 (Constraints). The 6 m VPZ shall also be incorporated on the proponent's building sketch/survey.

- All recommended erosion controls should be installed prior to commencing any works on the property to ensure the unevaluated wetland is not impacted and to ensure the development is entirely contained within the constraints area. Vegetation/seed/sod must be established on all bare soil areas at the end of the construction. The works cannot be considered complete until all surfaces are stable. The proponent's building sketch/survey should illustrate how all surfaces/grades will be stabilized/finished. The building sketch/survey should illustrate all interim and permanent erosion-sediment controls.

- Passive stormwater management controls should be incorporated into the development design. Examples include roof leaders being directed to an area where the flows will not gouge or destabilize soils over time. The warm flows from the roof leaders should be infiltrated into the ground, so as to reduce thermal impacts to the wetland feature. If the soils have a high infiltration rate/permeability in the area of the proposed seasonal residence, it may be possible to outlet the roof leaders onto these surfaces. Gravel can also be introduced at the end of the leaders to create an apron that dissipates the energy of the flows by distributing them over a larger area to enhance infiltration.

10.3 Construction Mitigation

- Proper erosion/sedimentation controls will be required at all times while heavy equipment operates at the site. Heavy-duty silt fence should be installed around the perimeter of the construction limit (6 m VPZ) prior to any machinery entering the construction area, as illustrated by Figure 6 and/or the building sketch/survey. Appendix F illustrates how the heavy-duty silt fence/wildlife exclusion fence is to be installed.

- It is the responsibility of either the contractor and/or owner to ensure the Erosion-Sediment Controls (ESC) is checked on a regular basis, is functioning properly, and is sufficient to mitigate runoff conditions on-site. ORE staff anticipate the Township Building Inspector will verify whether the erosion-sedimentation controls are sufficient during the construction period.

- The heavy-duty silt fence provides a solution to mitigate sheet runoff, not concentrated flows. Therefore, if concentrated flows result from filling, grading or construction drainage, another type of erosion/sedimentation control may be needed. The contractor or owner should illustrate any such supplementary controls on their Building sketch/survey .

- Only clean fill should be imported to the site. The fill should not contain organic materials such as plant debris or topsoil that may contain exotic or invasive species that could out-compete native species. If imported topsoil is required, only screened topsoil should be applied to top-dress the fill. Any imported materials that are stockpiled on-site should be surrounded by heavy-duty silt fence until the materials are applied. The fence will prevent species such as turtles from entering the construction area via the lake/wetland habitats to nest within the loose unconsolidated materials on-site during construction.

- If the applicant intends to raise the development footprint by importing fill to the site for grading, the graded slopes shall remain inside the limits illustrated on Figure 6 (or proponent's Building sketch/survey). They should also be at a reasonable grade (i.e., 3:1 or shallower), to ensure that materials are stable and do not erode past the 6 m VPZ, once the heavy-duty silt fence has been removed. Although not anticipated, any steeper embankment slopes proposed at the site would require the installation of slope stability controls, and should be incorporated into the final grading plans, if such are proposed.

- To reduce potential post-construction sedimentation, the site should be quickly seeded or sodded to re-establish the root structure within the upper soils where areas have been disturbed and soils are exposed. Once the seeding or sodding is determined to be a success and the soils are stable, the erosion/sedimentation controls (silt fence, etc.) can be removed. If approvals are granted and construction proceeds this winter/early spring season, the controls must remain in place until the seeding takes/germinates in the spring season.

- Absolutely no construction equipment can operate beyond the 6 m VPZ construction limit and/or property boundary nor enter any of the waterways to conduct the work. No new swales or other drainage works intended to direct

water toward the unevaluated wetland should be constructed, unless approved by the Township's Building Department. The existing grade on the lot appears to be toward the wetland, thus runoff should continue to be directed towards this feature.

- If runoff from precipitation is turbid and observed to be draining into the wetland during construction (or in the post construction era), any resulting sediment should be manually removed and placed within the work area. The proponent and/or contractor should then determine what steps are necessary to prevent turbid runoff from leaving the site and take the necessary steps to mitigate the erosion-sedimentation.

- We are currently outside the breeding bird window which spans from April 15th to August 31st, each year. This is a highly sensitive period for any birds that have already established their nests within trees/shrubs on the property. If vegetation removal is planned to occur this year, it should be completed prior to April 15th when the early migratory birds arrive in Ontario. If it is not completed prior to April 15th, there would be a hiatus till August 31st before the vegetation could be removed.

- Some of the bird species (potential SAR birds) that could nest within the woodland and unevaluated wetland during the breeding bird period are sensitive to light, along with a variety of herptiles such as amphibians. As such, it is recommended that any outside lighting associated with the proposed residence utilize low wattage light bulbs and should not be directed towards the wetland areas. High wattage or improperly directed bright lighting could potentially sterilize breeding areas within the wetland with respect to light-sensitive species.

10.4 Closing Remarks

It is our opinion that the applicant should be granted both a Building Permit and CVC Permit to allow construction of the new seasonal single residential development and private services on the property, provided the mitigation measures recommended herein are adhered to and are included in the final building sketch/survey attached to any permit/approval by CVC . The proponent should recognize that this *scoped* Natural Heritage Evaluation provides recommendations pertaining only to natural environmental issues. Other issues related to Land Use Planning, servicing and/or Engineering may also need to be addressed with respect to any future application(s) and/or development plans. The proponent should obtain all required permits from the agencies prior to commencing any construction on-site. Failure to do so may result in delays and/or other liabilities.

End of *Scoped* NHE Report

Yours truly,
Oakridge Environmental Limited

Rob West, HBSc. CSEB
Senior Environmental Scientist

Selected References

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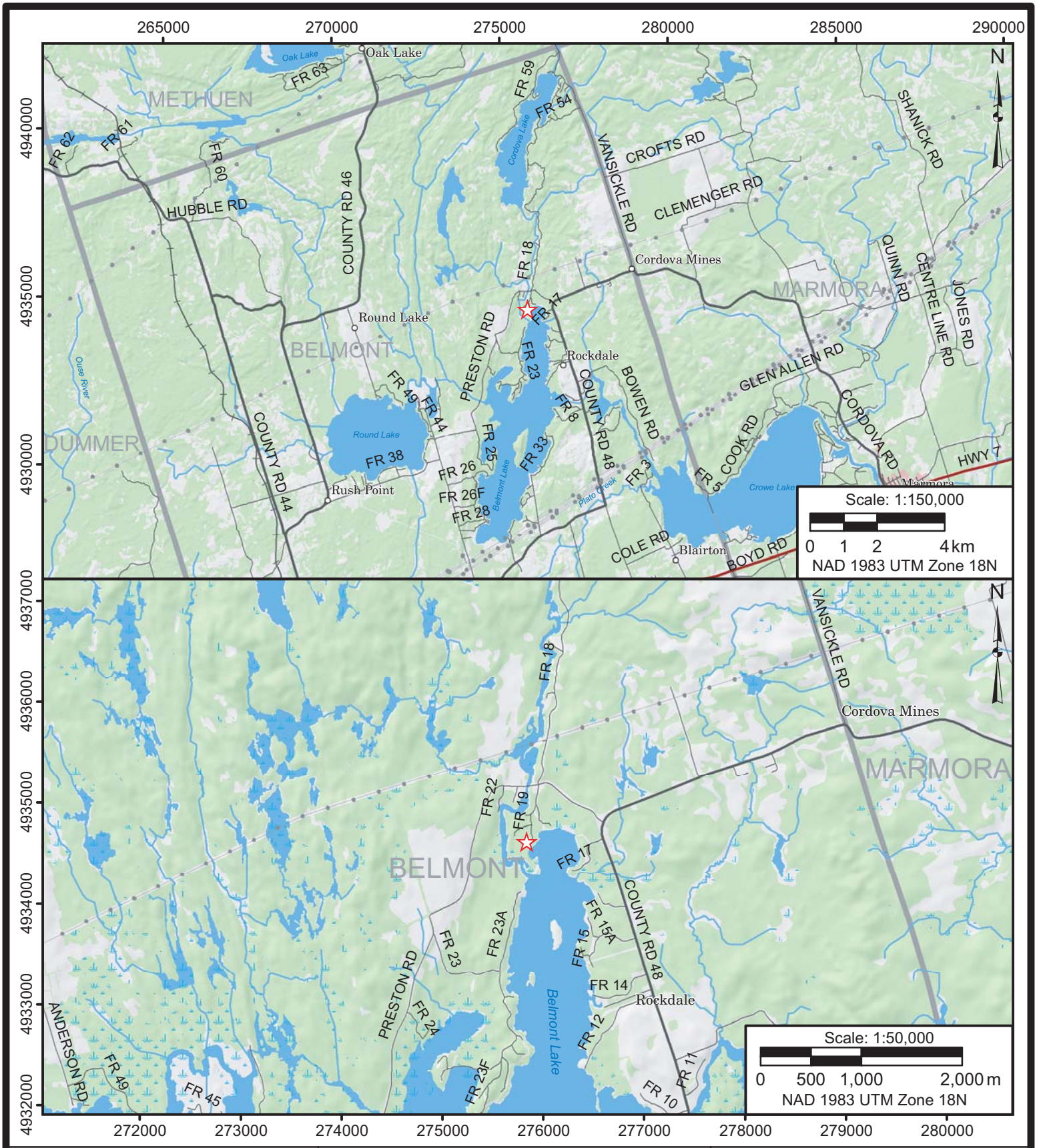
Figures



☆ Approximate Site Location

Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2022)

Optimized for Oakridge Environmental Ltd. printing

***Scoped* Natural Heritage Evaluation (*s*NHE)**
Proposed Single Seasonal Residential Development
85 Fire Route 19C, Belmont Lake
Part of Lot 20, Concession 3 (Belmont)
Township of Havelock-Belmont-Methuen,
County of Peterborough

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

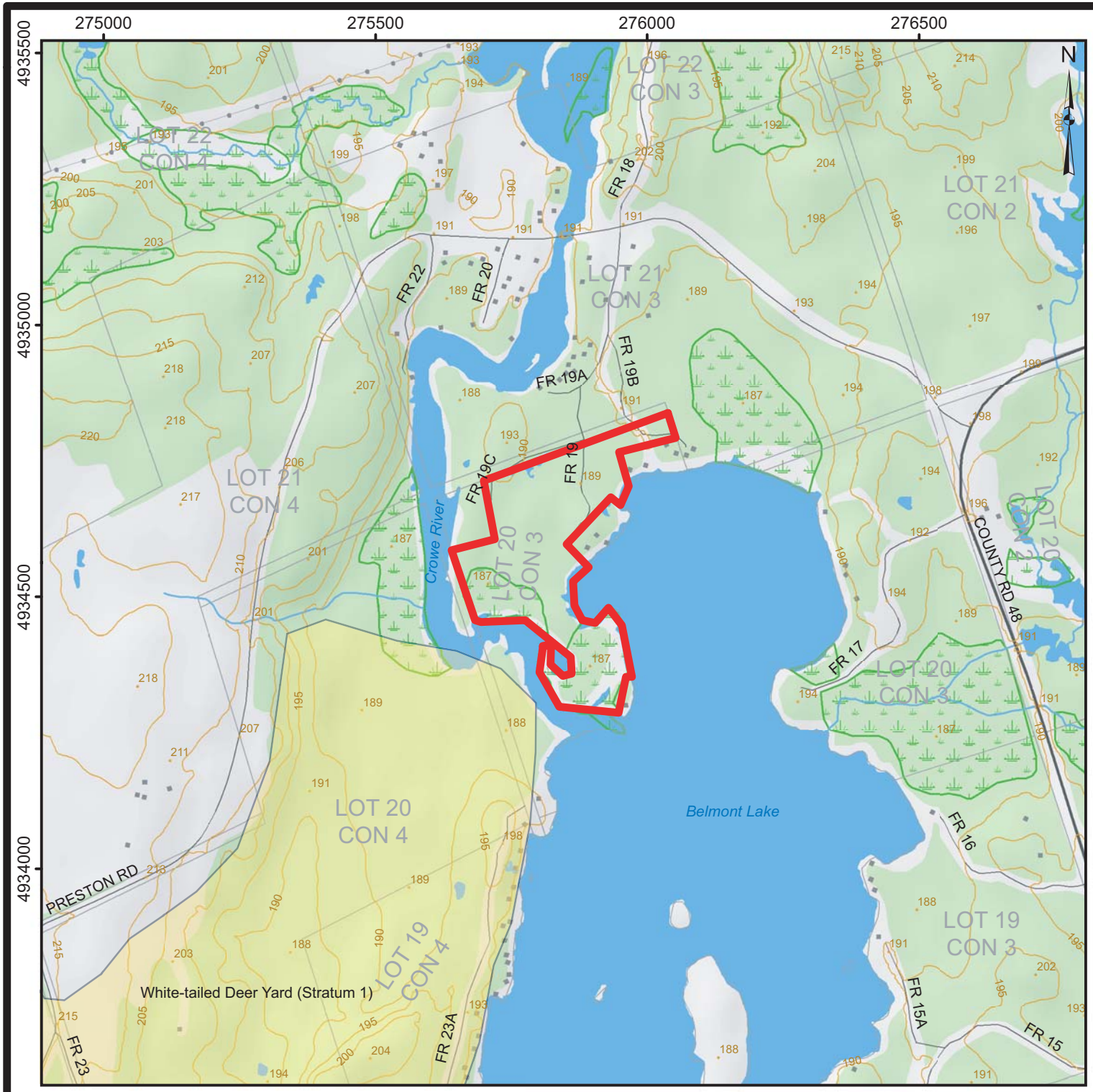
North American Datum (NAD) 1983

TITLE
General Location

PROJECT # 22-3054

DATE March 2023

FIGURE NO. **1**



***Scoped* Natural Heritage Evaluation (*s*NHE)**
Proposed Single Seasonal Residential Development
85 Fire Route 19C, Belmont Lake
Part of Lot 20, Concession 3 (Belmont)
Township of Havelock-Belmont-Methuen,
County of Peterborough

- Approximate Property Boundary
- Wetland (Unevaluated)
- Watercourse
- Waterbody
- Wooded Area
- White-tailed Deer Yard (Stratum I)
- Spot Height (m asl)
- Contour (5m Intervals)
- Building (symbol)
- Transmission Line
- Arterial Road
- Road
- Geographic Lot Fabric

Scale: 1:10,000

0 100 200 400 m

Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2022)

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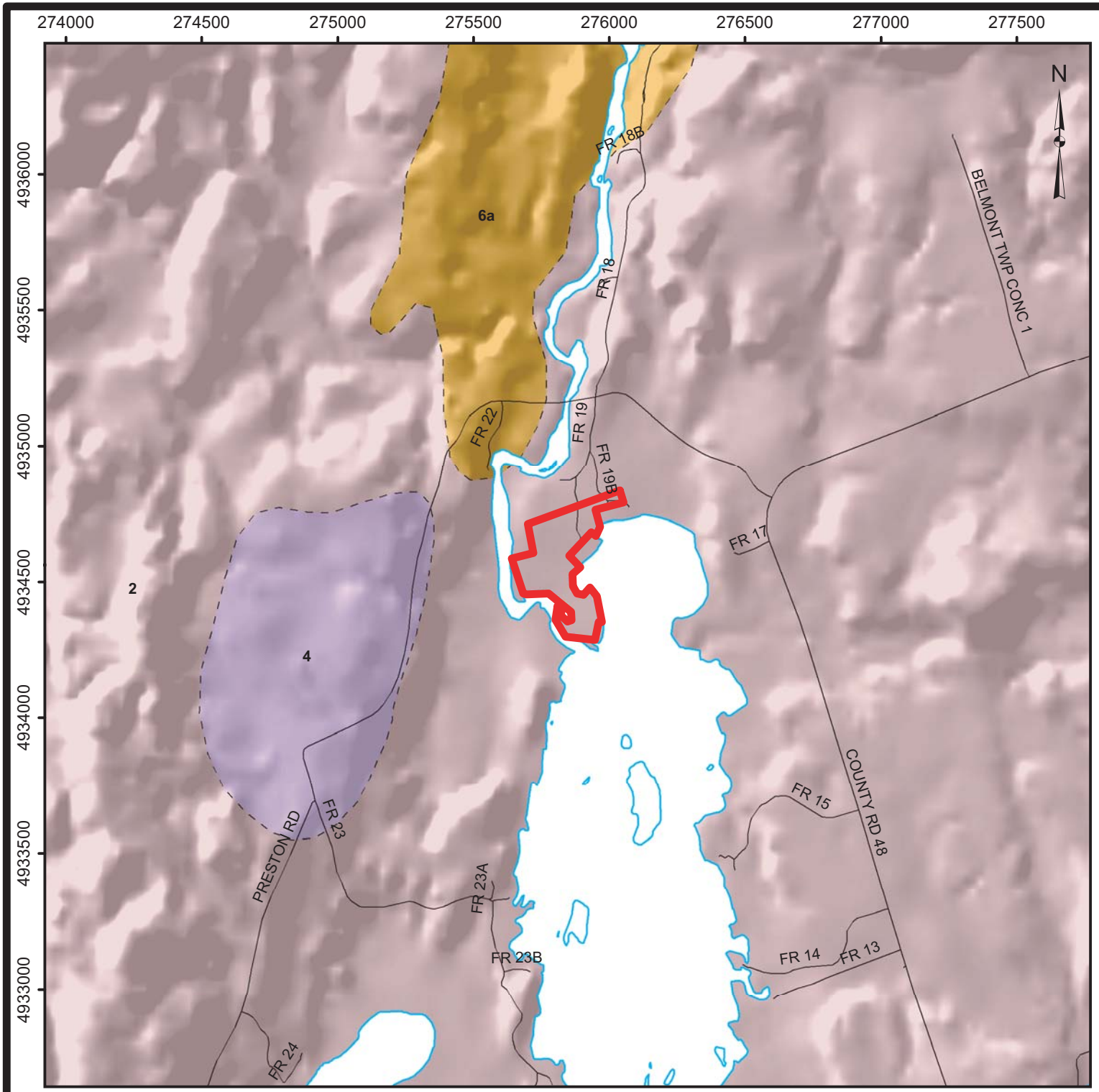
TITLE

Topography and Drainage

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
22-3054	**2**
DATE	
March 2023	



NAD 1983 UTM Zone 18N

***Scoped* Natural Heritage Evaluation (*s*NHE)**
Proposed Single Seasonal Residential Development
85 Fire Route 19C, Belmont Lake
Part of Lot 20, Concession 3 (Belmont)
Township of Havelock-Belmont-Methuen,
County of Peterborough

- Approximate Property Boundary
- Geological Contact
- Lake
- 2 — Precambrian bedrock-drift complex
- 4 — Paleozoic bedrock-drift complex
- 6a — In moraines, kames, eskers and crevasse fills

Scale: 1:20,000

0 200 400 800 m

Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2022)

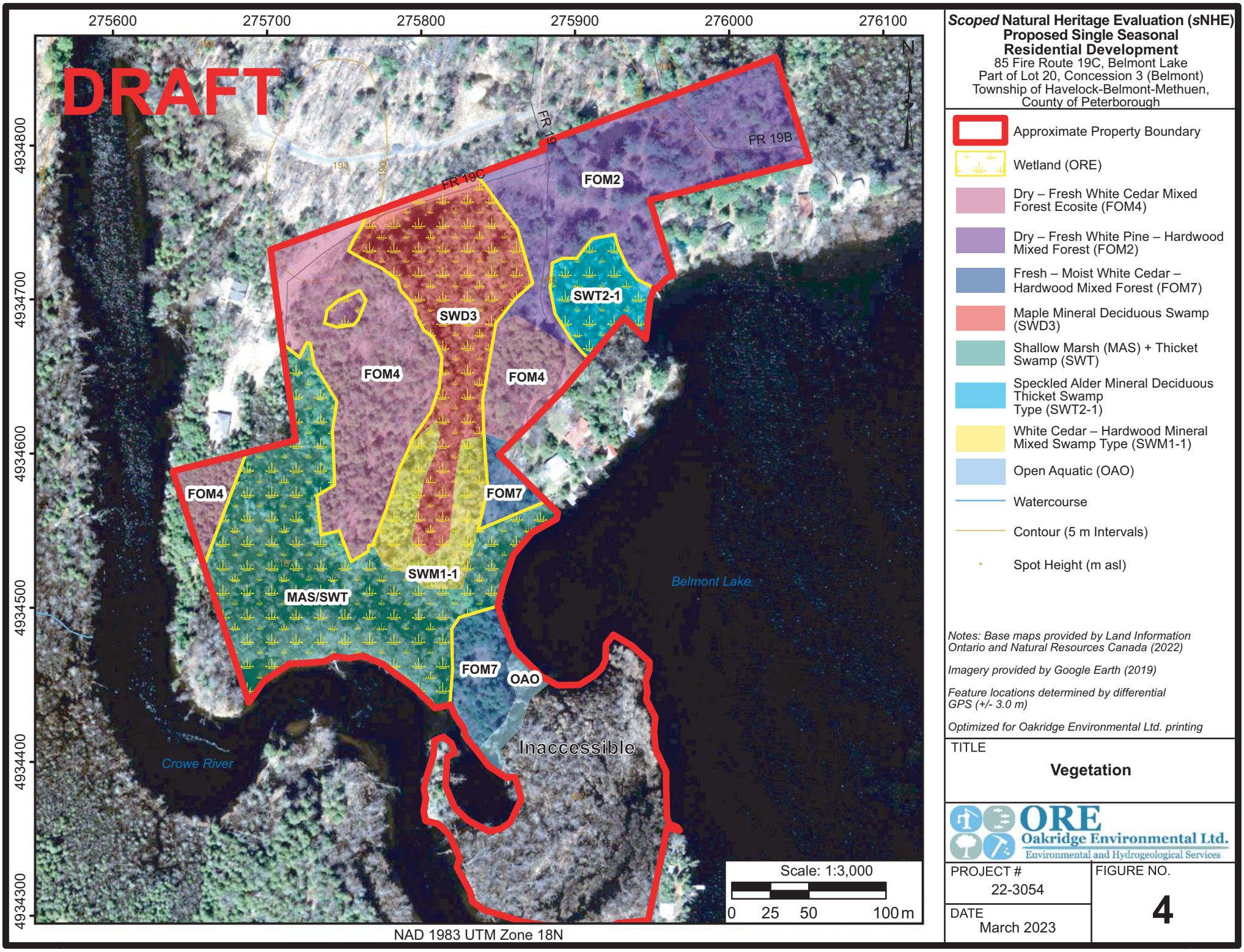
Optimized for Oakridge Environmental Ltd. printing

TITLE

Surficial Geology

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
22-3054	**3**
DATE	
March 2023	



***Scoped* Natural Heritage Evaluation (*s*NHE)**
Proposed Single Seasonal Residential Development
85 Fire Route 19C, Belmont Lake
Part of Lot 20, Concession 3 (Belmont)
Township of Havelock-Belmont-Methuen,
County of Peterborough

- Approximate Property Boundary
- Wetland (ORE)
- Dry – Fresh White Cedar Mixed Forest Ecosite (FOM4)
- Dry – Fresh White Pine – Hardwood Mixed Forest (FOM2)
- Fresh – Moist White Cedar – Hardwood Mixed Forest (FOM7)
- Maple Mineral Deciduous Swamp (SWD3)
- Shallow Marsh (MAS) + Thicket Swamp (SWT)
- Speckled Alder Mineral Deciduous Thicket Swamp Type (SWT2-1)
- White Cedar – Hardwood Mineral Mixed Swamp Type (SWM1-1)
- Open Aquatic (OAO)
- Watercourse
- Contour (5 m Intervals)
- Spot Height (m asl)

Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2022)

Imagery provided by Google Earth (2019)

Feature locations determined by differential GPS (+/- 3.0 m)

Optimized for Oakridge Environmental Ltd. printing

TITLE

Vegetation

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
22-3054	4
DATE	
March 2023	

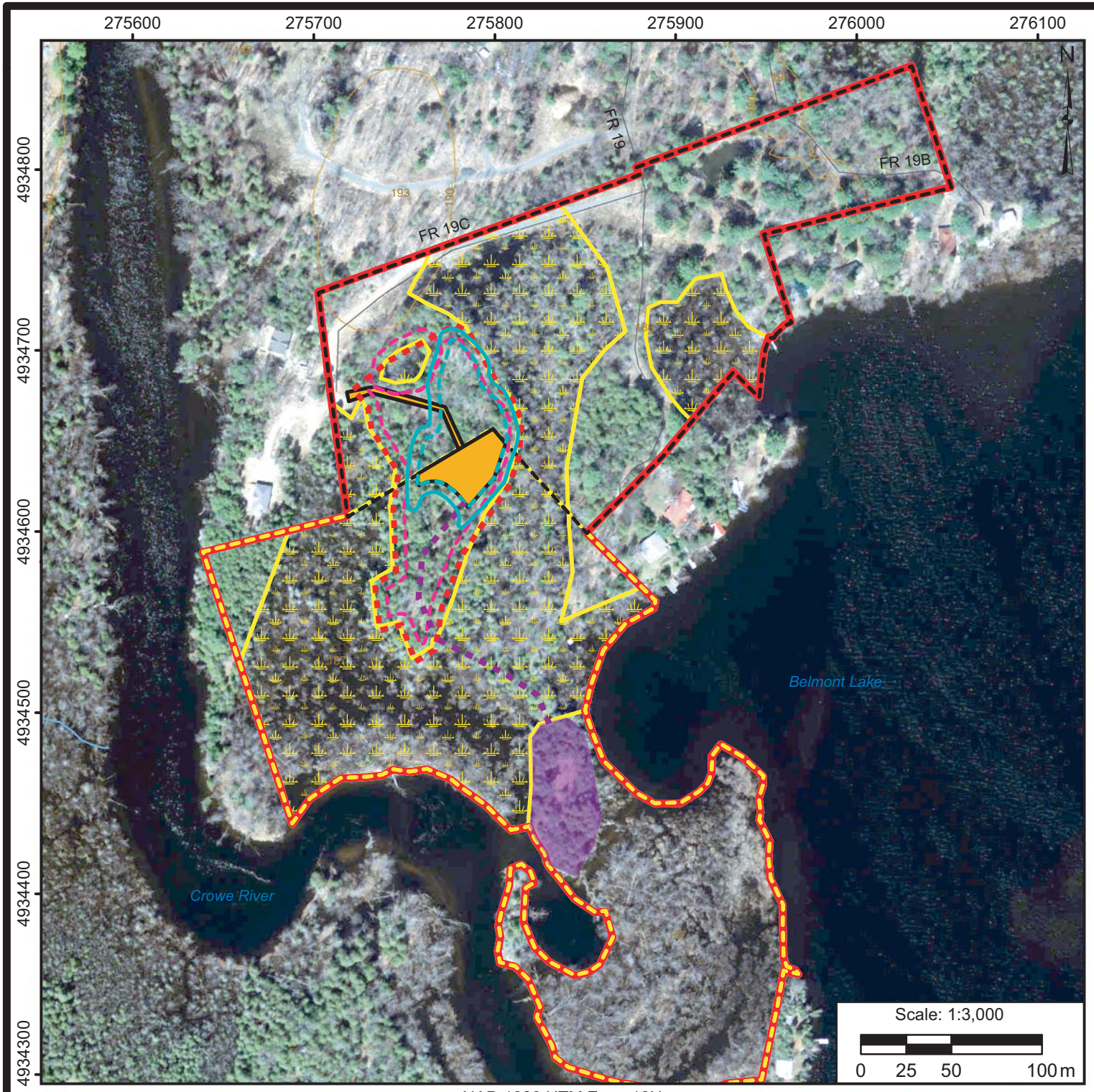
Photo A (Above): taken from the upland island area overlooking the watercourse west of the property.

Photo B (Above): taken within the upland forested area (FOM4) near the potential development area.

Photo C (Above): taken within the swamp to highlight ground conditions.

Photo D (Above): taken overlooking the MAS/SWT wetland west of upland forest (FOM4).

	***Scoped* Natural Heritage Evaluation (sNHE)** **Proposed Single Seasonal Residential Development** 85 Fire Route 19C, Belmont Lake Part of Lot 20, Concession 3 (Belmont) Township of Havelock-Belmont-Methuen, County of Peterborough	TITLE **Site Photos**
Photos Taken: September 07, 2022	ORE Oakridge Environmental Ltd. Environmental and Hydrogeological Services	PROJECT # 22-3054 DATE March 2023 FIGURE NO. **5**
Optimized for Oakridge Environmental Ltd. printing		



***Scoped* Natural Heritage Evaluation (*s*NHE)**
Proposed Single Seasonal Residential Development
85 Fire Route 19C, Belmont Lake
Part of Lot 20, Concession 3 (Belmont)
Township of Havelock-Belmont-Methuen,
County of Peterborough

- Approximate Property Boundary
- Zoning: Rural
- Zoning: Seasonal Residential
- Floodline Contour Elevation (188 m asl)
- Floodline Setback (6 m)
- CVCA Wetland Boundary
- Wetland (ORE)
- Wetland Setback (6 m)
- Developable Area and Potential Driveway (977 m2 | 0.24 acres)
- Upland Island Area
- Proposed Passive Use Trail
- Watercourse
- Contour (5 m Intervals)
- Spot Height (m asl)

Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2022)

Imagery provided by Google Earth (2019)

Wetland delineation by Crowe Valley Conservation Area (CVCA), and floodline contour elevation provided by Miller (2022)

Zoning as per Township Zone Schedule 1A

Feature locations determined by differential GPS (+/- 1.5 m)

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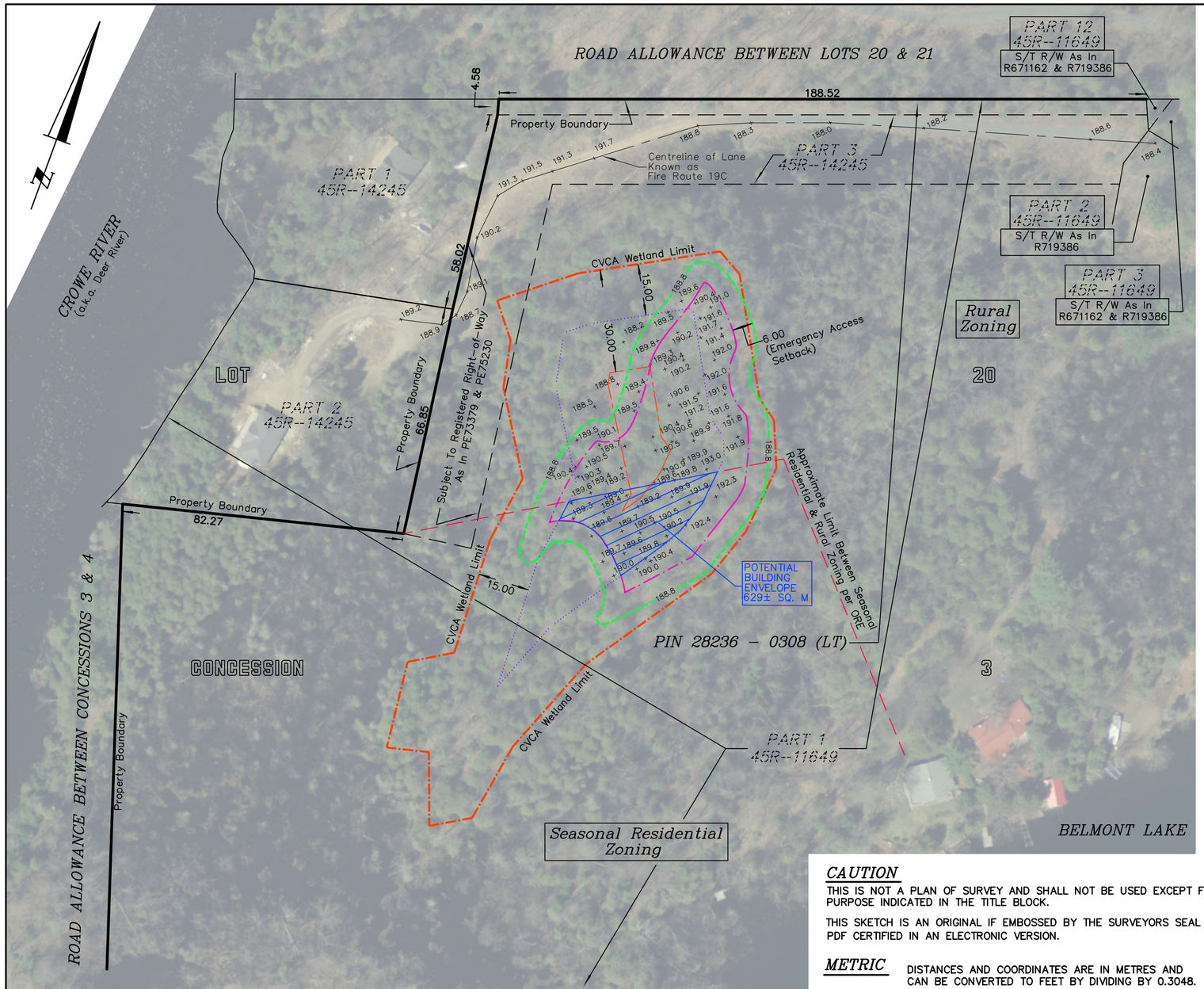
TITLE
Constraints

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
22-3054	6
DATE: March 2023	

Appendix A

PA Miller Surveying Sketch



SKETCH TO ILLUSTRATE ZONING
AND BUILDING ENVELOPE
AT 85 FIRE ROUTE 19
GEOGRAPHIC TOWNSHIP OF BELMONT
TOWNSHIP OF HAVELOCK–BELMONT–METHUEN
COUNTY OF PETERBOROUGH

SCALE 1 : 1000
KEVIN R.D. SMITH, O. L. S.

0 5 10 15 20 25 50 75 100m

NOTES

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 1.000194.

HORIZONTAL DATUM IS UTM ZONE 18N NAD83(CSRS) EPOCH 2010.

VERTICAL DATUM IS CGVD28 DERIVED FROM GNSS AND THE HT2.0 GEOID MODEL.

AERIAL IMAGERY DERIVED FROM SOUTH CENTRAL ONTARIO (SCOOP) 2013 DATASET. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENSE – ONTARIO.

LEGEND

SYMBOL	:	DENOTES
190.4 *		SPOT ELEVATION
CGVD28		CANADIAN GEODETIC VERTICAL DATUM 1928 (1978)
- - -		1:100 YEAR FLOODLINE CONTOUR ELEVATION 188.8 CGVD28
- - - -		6m EMERGENCY ACCESS SETBACK FROM 1:100 YEAR FLOODLINE
- - - -		WETLAND LIMIT DELINEATED BY CROWE VALLY CONSERVATION AUTHORITY
.....		15m SETBACK FROM WETLAND LIMIT
— - —		30m SETBACK FROM WETLAND LIMIT
ORE		OAKRIDGE ENVIRONMENTAL LTD.
S/T		SUBJECT TO
R/W		RIGHT-OF-WAY

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V–XXXXX

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29(3).

CAUTION

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK.

THIS SKETCH IS AN ORIGINAL IF EMBOSSED BY THE SURVEYORS SEAL OR IF IT IS PDF CERTIFIED IN AN ELECTRONIC VERSION.

METRIC

DISTANCES AND COORDINATES ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

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Appendix B

Species Descriptions

Birds

Barn Swallow (*Hirundo rustica*) is listed as "Threatened" by SARO and is protected under the ESA. The Barn Swallow inhabits open-rural and urban sites where buildings are situated near watercourses. Nesting is typically sporadic within loose colonies on building structures, bridges and other suitable overhanging structures. The cup-like mud nest is adhered to areas beneath the roof of the structure to conceal the nest from predators and keep it dry. The Barn Swallow feeds on insects by catching them on the wing.

Bobolink (*Dolichonyx oryzivorus*) is listed as "Threatened" by SARO and is protected under the ESA. The Bobolink prefers large tracts of tallgrass areas, either true prairies or hay fields, as it forages low to the ground in search of larvae and seeds.

Canada Warbler (*Cardellina canadensis*) is listed as "Special Concern" by SARO, and is not protected under the ESA. It prefers large tracts of mixed forests on bottomlands within wetlands or drainage courses. The species nests within the upper extremities of the canopy in deciduous and coniferous trees. The Canada Warbler feeds on beetles, caterpillars and common insects. Typically, this species prefers creeks and mixed forests with a coniferous edge along a moving creek, tributary or river system.

Common Nighthawk (*Chordeiles minor*) is listed as "Special Concern" by SARO, and is not protected under the ESA. The Common Nighthawk is part of the Nightjar family which prefers forest openings, bogs and sometimes open field/meadow areas. Nesting is on bare ground where both adults feed the young. Feeding can take place during day or night, while the species constantly forages for all types of insects.

Eastern Meadowlark (*Sturnella magna*) is listed as "Threatened" by SARO and is protected under the ESA. The Eastern Meadowlark is similar to Bobolink, as this species also prefers large tracts of agricultural fields or tallgrass prairies to nest within. Eastern Meadowlark is a ground nester, thus requires the tall grass to conceal its nest and eggs. Feeding includes beetles, crickets and spiders.

Eastern Whip-poor-will (*Anthrostomus vociferus*) is listed as "Threatened" by SARO and is protected under the ESA. The Whip-poor-will prefers a combination of large natural tracts of secondary succession forest, watercourses and edge habitat consisting of meadow areas, with open deciduous and pine woodlands. The Whip-poor-will does not construct a nest, but rather uses the soft leaf litter on the ground to form a nest and lay the eggs directly on the ground. The Whip-poor-will is a nighttime hunter, calling its own name while searching for large flying insects, beetles, moths, mosquitos and sometimes grasshoppers. The Whip-poor-will often

choose pine species adjacent to waterways to call from.

Eastern Wood-Pewee (*Contopus virens*) is listed as "Special Concern" by SARO and is not protected under the ESA. This species prefers mixed deciduous and coniferous woodlands which are open or considered edge habitat. Nesting occurs on a tree branch as the species catches insects from a perch.

Golden-winged Warbler (*Vermivora chrysoptera*) is listed as "Special Concern" by SARO and is not protected under the ESA. The Golden-winged Warbler prefers woodland edge habitat with young successional tree species and moist shrubby fields. This species gleans insects on shrubs and the forest floor and nesting occurs on the ground.

Grasshopper Sparrow (*Ammodramus savannarum*) is listed as "Special Concern" by SARO and is not protected under the ESA. The Grasshopper Sparrow prefers large (greater than 5 ha) grassland habitats where it breeds. Grassland habitats include pastures, hayfields, natural prairies, alvars. Nests are typically hidden within the grassland and its preferred diet in the summer is large insects (i.e., Grasshoppers).

Wood Thrush (*Hylocichia mustelina*) is listed as "Special Concern" by SARO and is protected under the ESA. The Wood Thrush enjoys relatively undisturbed, mature woodlands. Nesting occurs low in the fork of a tree as this species forages for berries and insects at ground level. Similar to the Eastern Wood-Pewee, this species prefers large tracts of woodland.

Amphibians & Reptiles

Eastern Musk Turtle (*Sternotherus odoratus*) is listed as "Special Concern" by SARO and is not protected under the ESA. Eastern Musk Turtles are found in ponds, lakes, marshes and rivers that are generally slow-moving have abundant emergent vegetation and muddy bottoms that they burrow into for winter hibernation.

Nesting habitat is variable, but it must be close to the water and exposed to direct sunlight. Nesting females dig shallow excavations in soil, decaying vegetation and rotting wood or lay eggs in muskrat lodges, on the open ground or in rock crevices.

Eastern Ribbon Snake (*Thamnophis sauritus*) is listed as "Special Concern" by SARO, and is not protected under the ESA. This species occurs mainly within large marshlands that have an open water content. This species uses the lily-pads and other vegetation within the wetland to bask in the sun. It also utilizes the deeper sections of the marsh to dive beneath the water when threatened by predators.

Gray Ratsnake [Frontenac Axis population] (*Pantherophis spiloides pop. 1*) is listed as "Threatened" by SARO, specifically the Frontenac Axis population. Gray Ratsnakes have prominent blotches that fade as the individual ages. The underside of the throat is a cream or white colour and their bellies have a checkered pattern of black blotches. They prefer wooded areas and savannahs adjacent to open fields or rocky outcrops. Gray Ratsnakes overwinter in rock crevices, mammal burrows and old foundations or wells. When nesting females utilize large rotten cavities in deciduous trees and stumps.

Midland Painted Turtle (*Chrysemys picta marginata*) is listed as "Special Concern" by COSEWIC and is currently under review by COSSARO. Midland Painted Turtles spend the majority of their lives in water. They prefer shallow water with aquatic vegetation, soft mud, and leaf litter at the bottom. Typically found basking on logs, rocks, and shorelines in sunlight. Midland Painted Turtles nest between mid-spring and early summer. They tend to choose gravely, sandy and loam soils for nesting.

Western Chorus Frog - Great Lakes - St. Lawrence - Canadian Shield population (*Pseudacris maculata pop. 1*) is listed as "Not at Risk" by SARO, however is listed as "Threatened" by SARA and COSEWIC. The Western Chorus Frog is a small frog which is brown to olive gray in colour. It has three dark lines on its back, a wider line on each side, and broad line across the eyes. Its call is a "cre-ee-ee-eek" sound similar to a fingernail being dragged across a comb. The Western Chorus prefers lowland habitats with open or discontinuous canopy. Also preferring areas which can become vernal pools in the spring. Vegetation to typical to find Western Chorus Frogs are: sedges (*Carex spp.*), cattails (*Typha spp.*), Reed Canary Grass (*Phalaris arundinacea*), Red Osier Dogwood (*Cornus stolonifera*), willows (*Salix spp.*), Speckled Alder (*Alnus incana ssp. rugosa*), Black Ash (*Fraxinus nigra*), and Red Maple (*Acer rubrum*).

Appendix C

NHIC Data

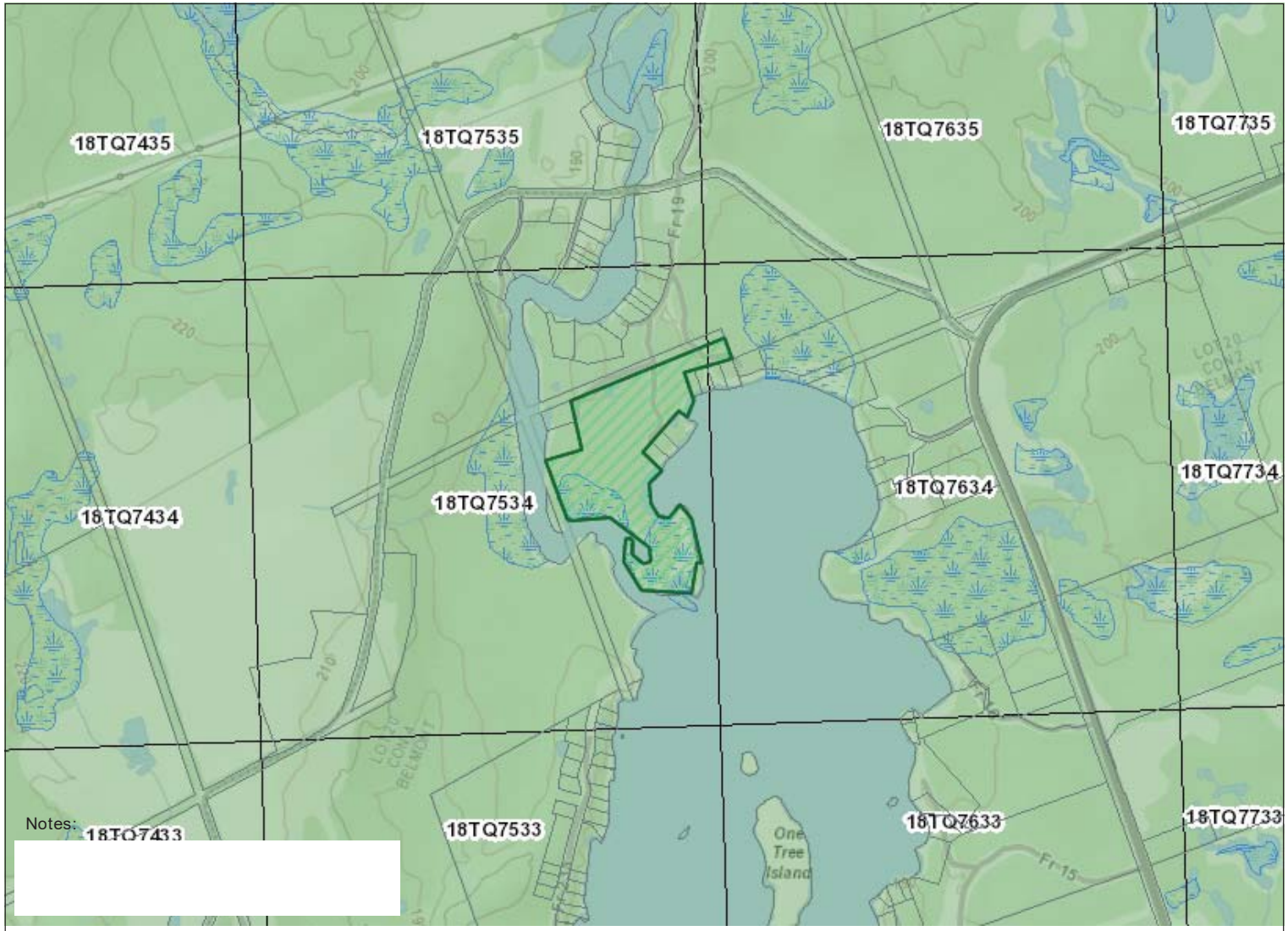
Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

NHIC Map

Map created:4/22/2022



Notes:

Legend

- Assessment Parcel
- NHIC 1 Km Grid
- ANSI
- Earth Science Provincially Significant/sciences de la terre d'importance provinciale
- Earth Science Regionally Significant/sciences de la terre d'importance régionale
- Life Science Provincially Significant/sciences de la vie d'importance provinciale
- Life Science Regionally Significant/sciences de la vie d'importance régionale
- Evaluated Wetland
- Provincially Significant/considérée d'importance provinciale
- Non-Provincially Significant/non considérée d'importance provinciale
- Unevaluated Wetland
- Conservation Reserve
- Provincial Park
- Natural Heritage System

0.7 0 0.33 0.7 Kilometres

Absence of a feature in the map does not mean they do not exist in this area.

NHIC Data

To work further with this data select the content and copy it into your own word or excel documents.

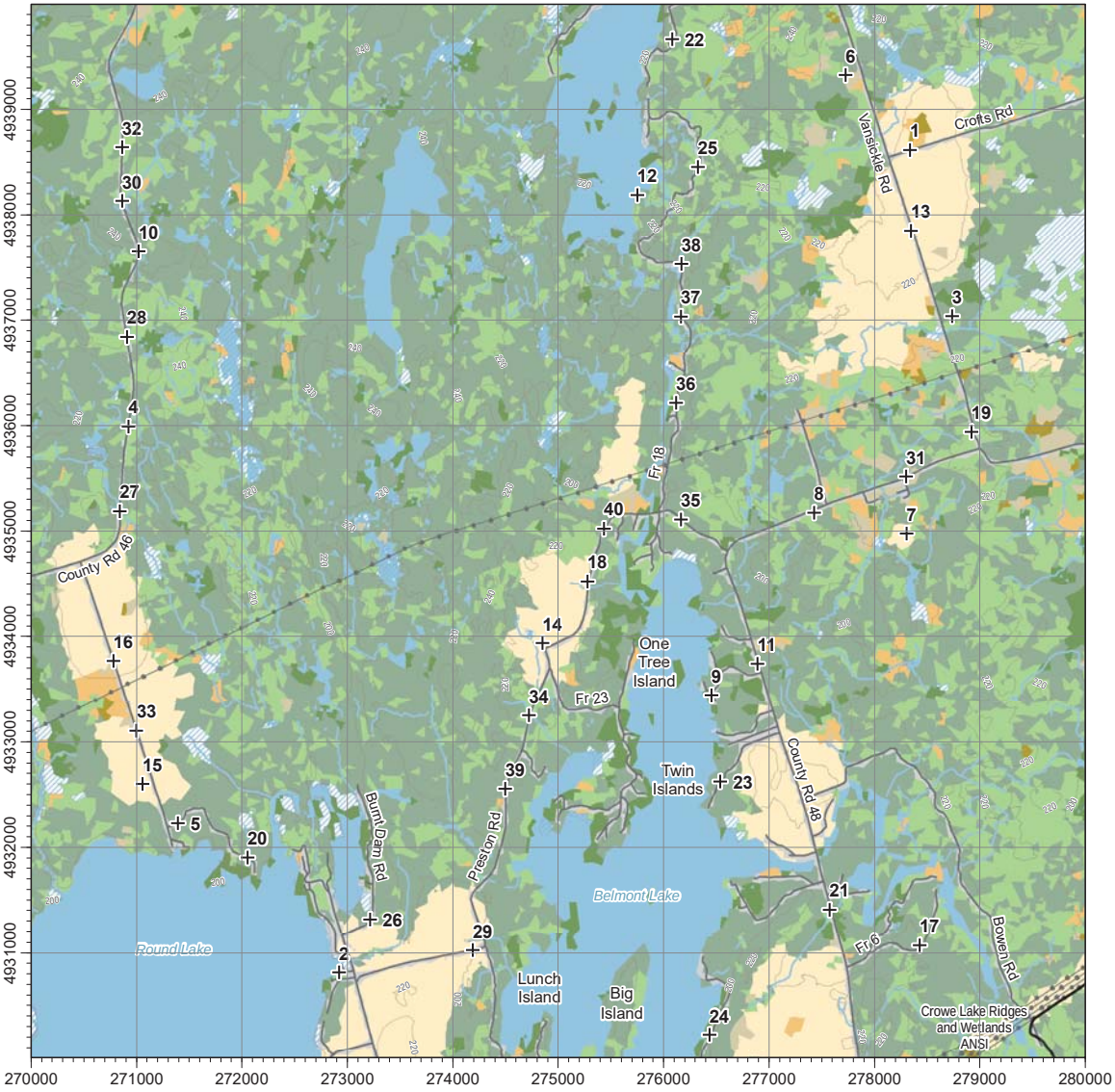
OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	ATLAS NAD83 IDENT	COMMENTS
1069520	SPECIES	Greater Redhorse	Moxostoma valenciennesi				18TQ7534	
1069520	SPECIES	Eastern Meadowlark	Sturnella magna		THR	THR	18TQ7534	
1069520	SPECIES	Bobolink	Dolichonyx oryzivorus		THR	THR	18TQ7534	
1069520	SPECIES	Western Chorus Frog - Great Lakes - St. Lawrence - Canadian Shield populati	Pseudacris maculata pop. 1		NAR	THR	18TQ7534	
1069530	WILDLIFE CONCENTRATION AREA	Mixed Wader Nesting Colony		SNR			18TQ7634	
1069530	SPECIES	Greater Redhorse	Moxostoma valenciennesi				18TQ7634	
1069530	SPECIES	Eastern Musk Turtle	Sternotherus odoratus		SC	SC	18TQ7634	
1069530	SPECIES	Midland Painted Turtle	Chrysemys picta marginata			SC	18TQ7634	
1069530	SPECIES	Eastern Ribbonsnake	Thamnophis sauritus		SC	SC	18TQ7634	
1069530	SPECIES	Wood Thrush	Hylocichla mustelina		SC	THR	18TQ7634	
1069530	SPECIES	Western Chorus Frog - Great Lakes - St. Lawrence - Canadian Shield populati	Pseudacris maculata pop. 1		NAR	THR	18TQ7634	

Appendix D

OBBA Data

Region / Région: 16

Square / Parcelle: 18TTQ73



Predefined point count coordinates
Coordonnées des points d'écoute prédéterminés

POINT +	EASTING UTM Est	NORTHING UTM Nord
1	278338	4938615
2	272920	4930813
3	278737	4937037
4	270922	4935990
5	271390	4932226
6	277727	4939323
7	278307	4934975
8	277426	4935171
9	276453	4933440
10	271020	4937652
11	276890	4933740
12	275752	4938187
13	278347	4937847
14	274850	4933935
15	271056	4932600
16	270781	4933769
17	278427	4931071
18	275280	4934521
19	278921	4935937
20	272051	4931901
21	277574	4931407
22	276080	4939665
23	276538	4932623
24	276436	4930218
25	276326	4938453
26	273215	4931313
27	270842	4935188
28	270909	4936840
29	274187	4931024
30	270865	4938130
31	278301	4935516
32	270865	4938640
33	270999	4933107
34	274721	4933250
35	276163	4935108
36	276118	4936217
37	276163	4937033
38	276171	4937533
39	274496	4932552
40	275436	4935022

Number of off-road point counts
Nombre de points d'écoute hors route

Broadleaf forest:	2	Grassland:	0
Coniferous forest:	0	Wetland:	0
Mixed forest:	3	Shrubland:	0

Predefined / Prédéterminés: 20
Off-road / Hors route: 5

Atlas-2 off-road point ● **Point hors route Atlas-2**

0 1 km

Atlas des oiseaux nicheurs Ontario Breeding Bird Atlas

Legend	Légende
Expressway or highway	Autoroute ou route nationale (asphaltée)
Regional or local road	Route régionale ou locale (asphaltée ou non)
Resource / Recreation	Ressource / route récréative
Rail line	Chemin de fer
Utility corridor	Ligne de transport d'énergie
Watercourse	Rivière ou ruisseau
Protected or conserved area	Zone protégée ou conservée
Fire disturbance since 2000	Incendie perturbé depuis 2000
Broadleaf forest 20	Forêt de feuillus
Coniferous forest 3	Forêt de conifères
Mixed forest 45	Forêt mixte
Shrubland 2	Milieu arbustif
Grassland	Prairie
Barren 1	Dénudé
Wetland 2	Milieu humide
Agriculture 9	Milieu agricole
Water 15	Eau
Developed area 3	Zone développée
Unclassified	Non classifié

The approximate percent coverage of each habitat type is indicated by the numbered box in the legend.

La couverture approximative est indiquée en pourcentage dans le rectangle coloré de la légende.

Cartographic production by Birds Canada
Production cartographique par oiseaux Canada

Note: The project partners are in no way responsible for any inaccuracies, mistakes or omissions in the information that appears on this map.

Avis : Les responsables du projet d'atlas ne peuvent être tenus responsables de toute inexactitude, erreur ou omission concernant les informations apparaissant sur cette carte.

6° Universal Transverse Mercator (UTM) Projection; Zone 18, Central Meridian -75°; North American Datum 1983 (NAD 83)

Projection universelle transverse de Mercator (UTM) 6° Zone 18, méridien central -75°; Système de référence géodésique nord-américain 1983 (NAD 83)

BIRDS CANADA OISEAUX CANADA

March 2021 / mars 2021

https://www.birdsontario.org/

18TTQ73

Peterborough

Region / Région: 16

BIRDS CANADA
OISEAUX CANADA

Square Summary (18TTQ73) [change]

	#species				#hours		#pc done	
	poss	prob	conf	total	total	peak	road	offrd
Curr.	31	25	49	105	102.9	66.9	28	0
Prev.	47	23	48	118	82.9	—	30	

Region summary (#16: Peterborough, ON)

#squares	#sq with data	#species	#squares (pc)	
			target	compl.
60	60	161	60	24
60	60	185	0	60

Target number of point counts in this square: 25 in total: 20 road side, 5 off road (Broadleaf Forest in 2, Mixed Forest in 3). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.**Predef. completed:** [01, 02, 04, 05, 08, 10, 11, 13, 14, 15, 16, 18, 19, 20, 21, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40]

SPECIES	Prev.	Code	%
Canada Goose	FY	FY	76
Mute Swan ‡			3
Trumpeter Swan		P	20
Wood Duck	FY	AE	76
Blue-winged Teal ‡	FY		8
Northern Shoveler ‡			0
Gadwall ‡			0
American Wigeon ‡			0
Mallard	T	FY	78
American Black Duck			5
Northern Pintail ‡			0
Green-winged Teal ‡			0
Redhead †			0
Ring-necked Duck			20
Lesser Scaup ‡			0
Hooded Merganser	T	H	53
Common Merganser ‡	H	FY	20
Ruddy Duck ‡			0
Wild Turkey	FY	FY	86
Ruffed Grouse	FY	FY	85
Ring-necked Pheasant ‡			0
Pied-billed Grebe			15
Rock Pigeon (Feral Pigeon)	FY	FY	48
Mourning Dove	D	NU	80
Yellow-billed Cuckoo	S	H	50
Black-billed Cuckoo	S	S	66
Coccyzus sp. ‡	S		0
Common Nighthawk §	S	S	20
Eastern Whip-poor-will §	H		33
Chimney Swift ‡			6
Ruby-throated Hummingbird	D	H	68
Virginia Rail	S	A	53
Sora	S		16

SPECIES	Prev.	Code	%
Common Gallinule ‡			10
American Coot ‡			1
Sandhill Crane ‡			21
Killdeer §	P	A	50
Upland Sandpiper †	S		8
American Woodcock	T	T	43
Wilson's Snipe	S	S	48
Spotted Sandpiper	H		40
Ring-billed Gull § ‡			1
Herring Gull §	H	AE	23
Caspian Tern ‡			0
Black Tern †			1
Common Tern § ‡	H		0
Common Loon	FY	AE	71
Double-crested Cormorant § ‡			3
American Bittern	S	S	61
Least Bittern †			21
Great Blue Heron §	H	H	60
Green Heron §	A	H	43
Turkey Vulture	H	H	85
Osprey	NY	AE	48
Northern Harrier			26
Sharp-shinned Hawk	H		20
Cooper's Hawk	H		16
Northern Goshawk ‡	H		1
Bald Eagle ‡			5
Red-shouldered Hawk	S		30
Broad-winged Hawk	FY	AE	78
Red-tailed Hawk		H	45
Eastern Screech-Owl			10
Great Horned Owl ‡		S	13
Barred Owl	S	A	38
Long-eared Owl ‡			3

SPECIES	Prev.	Code	%
Short-eared Owl †			0
Northern Saw-whet Owl			3
Belted Kingfisher	NU	NB	86
Yellow-bellied Sapsucker	NY	CF	96
Red-headed Woodpecker †			8
Red-bellied Woodpecker		T	35
Black-backed Woodpecker ‡			1
Downy Woodpecker	S	FY	81
Hairy Woodpecker	S	FY	91
Pileated Woodpecker	FY	P	86
Northern Flicker	CF	S	91
American Kestrel §	AE	FY	46
Merlin	NU	FY	38
Peregrine Falcon ‡			0
Olive-sided Flycatcher ‡			6
Eastern Wood-Pewee §	S	A	100
Yellow-bellied Flycatcher ‡			0
Alder Flycatcher	S	S	90
Willow Flycatcher	S		33
Least Flycatcher	S	T	90
Eastern Phoebe	FY	NE	98
Great Crested Flycatcher	P	CF	100
Eastern Kingbird	CF	AE	86
Yellow-throated Vireo	A	CF	30
Blue-headed Vireo	S	S	71
Philadelphia Vireo ‡			0
Warbling Vireo	S	T	71
Red-eyed Vireo	A	CF	100
Loggerhead Shrike †			0
Canada Jay ‡			0
Blue Jay	CF	CF	100
American Crow	FY	FY	93
Common Raven	NE	NB	91

SPECIES	Prev.	Code	%
Black-capped Chickadee	CF	CF	96
Boreal Chickadee ‡			0
Horned Lark ‡	S		5
Northern Rough-winged Swallow			18
Purple Martin ‡	FY		0
Tree Swallow	NY	FY	80
Bank Swallow §			10
Barn Swallow §	FY	FY	71
Cliff Swallow §			16
Ruby-crowned Kinglet ‡			0
Golden-crowned Kinglet	CF	H	26
Red-breasted Nuthatch	T	T	93
White-breasted Nuthatch	FY	T	86
Brown Creeper	T	FY	61
Blue-gray Gnatcatcher ‡			3
House Wren	T	CF	76
Winter Wren	T	D	96
Sedge Wren ‡		S	8
Marsh Wren			41
Carolina Wren ‡			5
European Starling	FY	CF	80
Gray Catbird	FY	CF	80
Brown Thrasher	FY	NE	73
Northern Mockingbird ‡			1
Eastern Bluebird	FY	AE	51
Veery	CF	T	100
Swainson's Thrush			13
Hermit Thrush	S	D	75
Wood Thrush §	S	S	85
American Robin	CF	NY	98
Cedar Waxwing	N	AE	83
House Sparrow	AE	S	33
Evening Grosbeak ‡			0

SPECIES	Prev.	Code	%
House Finch			15
Purple Finch	S	FY	95
Red Crossbill ‡			5
White-winged Crossbill ‡			3
Pine Siskin ‡		S	10
American Goldfinch	CF	D	93
Grasshopper Sparrow §	S	S	21
Chipping Sparrow	CF	FY	95
Clay-colored Sparrow ‡			15
Field Sparrow §	S	T	60
Dark-eyed Junco ‡			3
White-throated Sparrow	T	S	95
Vesper Sparrow		S	26
Savannah Sparrow	V	S	56
Song Sparrow	CF	CF	100
Lincoln's Sparrow ‡			5
Swamp Sparrow	CF	FY	98
Eastern Towhee §		S	48
Bobolink §	CF	T	50
Western Meadowlark ‡	S		0
Eastern Meadowlark §	FY	T	55
Orchard Oriole ‡			3
Baltimore Oriole	P	CF	75
Red-winged Blackbird	CF	NE	100
Brown-headed Cowbird	FY	S	60
Common Grackle	FY	CF	98
Ovenbird	T	T	98
Northern Waterthrush	A	S	91
Golden-winged Warbler †	FY		13
Blue-winged Warbler ‡			8
Brewster's Warbler (hybrid) ‡	A		0
Golden-winged/Blue-winged Warbler ‡	S		0
Black-and-white Warbler	S	CF	96

SPECIES	Prev.	Code	%
Tennessee Warbler ‡			0
Nashville Warbler	S	T	90
Mourning Warbler	S	S	65
Common Yellowthroat	A	A	100
Hooded Warbler ‡			0
American Redstart	S	NB	96
Cape May Warbler ‡			0
Cerulean Warbler †			3
Northern Parula ‡			10
Magnolia Warbler	CF		70
Bay-breasted Warbler ‡			0
Blackburnian Warbler	S		65
Yellow Warbler	CF	NB	83
Chestnut-sided Warbler	CF	FY	93
Black-throated Blue Warbler	S		53
Pine Warbler	S	CF	91
Yellow-rumped Warbler	FY	S	80
Prairie Warbler †			0
Black-throated Green Warbler	T	T	91
Canada Warbler §	S		58
Scarlet Tanager	S	T	91
Northern Cardinal		P	50
Rose-breasted Grosbeak	S	S	98
Indigo Bunting	T	S	95

This list includes all breeding species expected in the region #16 (Peterborough). Underlined species are those that you should try to add to this square (18TTQ73). They have not yet been reported in this square, but have been reported in more than 50% of the squares in this region so far. "Prev." is the code for the highest breeding evidence for that species in square 18TTQ73 in the previous atlas. "Code" is the code for the highest breeding evidence for that species in square 18TTQ73 over the last 5 years. The % columns give the percentage of squares in that region where that species was reported (this gives an idea of the expected chance of finding that species in region #16). Rare/Colonial Species Report Forms should be completed for species marked: § (Species of interest), ‡ (regionally rare), † (provincially rare). An up-to-date version of this sheet is available from https://naturecounts.ca//nc//atlas/summaryform.jsp?squareID=18TTQ73&lang=EN Data current as of **24/07/2022 22:20**.

Appendix E

Species List

Species List

KINGDOM	Common Name	Scientific Name	SARO	SARA
Animalia				
		Polistes fuscatus		
	American Crow	Corvus brachyrhynchos		
	American Robin	Turdus migratorius		
	American Woodcock	Scolopax minor		
	Autumn Meadowhawk	Sympetrum vicinum		
	Black-capped Chickadee	Poecile atricapillus		
	Blue Jay	Cyanocitta cristata		
	Brown Thrasher	Toxostoma rufum		
	Common Eastern Bumble Bee	Bombus impatiens		
	Common Grackle	Quiscalus quiscula		
	Common Loon	Gavia immer	NAR	
	Eastern Chipmunk	Tamias striatus		
	Eastern Kingbird	Tyrannus tyrannus		
	Gray Catbird	Dumetella carolinensis		
	Green Frog	Lithobates clamitans		
	Hairy Woodpecker	Dryobates villosus		
	Mallard	Anas platyrhynchos		
	Marsh Pond Snail	Stagnicola elodes		
	Milkweed Tussock Moth	Euchaetes egle		
	Northern Flicker	Colaptes auratus		
	Northern Leopard Frog	Lithobates pipiens	NAR	
	Northern Raccoon	Procyon lotor		
	Pileated Woodpecker	Dryocopus pileatus		
	Red Squirrel	Tamiasciurus hudsonicus		
	Red-spotted Newt	Notophthalmus viridescens viridescens		
	Swamp Sparrow	Melospiza georgiana		

KINGDOM	Common Name	Scientific Name	SARO	SARA
	White-tailed Deer	Odocoileus virginianus		
	Wild Turkey	Meleagris gallopavo		
	Wood Frog	Lithobates sylvaticus		
	Yellow-bellied Sapsucker	Sphyrapicus varius		
Plantae				
	Andrews' Bottle Gentian	Gentiana andrewsii		
	Balsam Fir	Abies balsamea		
	Balsam Poplar	Populus balsamifera		
	Basswood	Tilia americana		
	Black Ash	Fraxinus nigra		
	Black Cherry	Prunus serotina		
	Blue-stemmed Goldenrod	Solidago caesia		
	Bog Goldenrod	Solidago uliginosa		
	Bracken Fern	Pteridium aquilinum		
	Broad-leaved Arrowhead	Sagittaria latifolia		
	Broad-leaved Cattail	Typha latifolia		
	Bulblet Bladder Fern	Cystopteris bulbifera		
	Bull Thistle	Cirsium vulgare		
	Bur Oak	Quercus macrocarpa		
	Canada Fly Honeysuckle	Lonicera canadensis		
	Canada Goldenrod	Solidago canadensis		
	Cardinal Flower	Lobelia cardinalis		
	Coltsfoot	Tussilago farfara		
	Common Burdock	Arctium minus		
	Common Buttercup	Ranunculus acris		
	Common Dandelion	Taraxacum officinale		
	Common Hawkweed	Hieracium lachenalii		
	Common Hop	Humulus lupulus		
	Common Milkweed	Asclepias syriaca		
	Common Motherwort	Leonurus cardiaca		

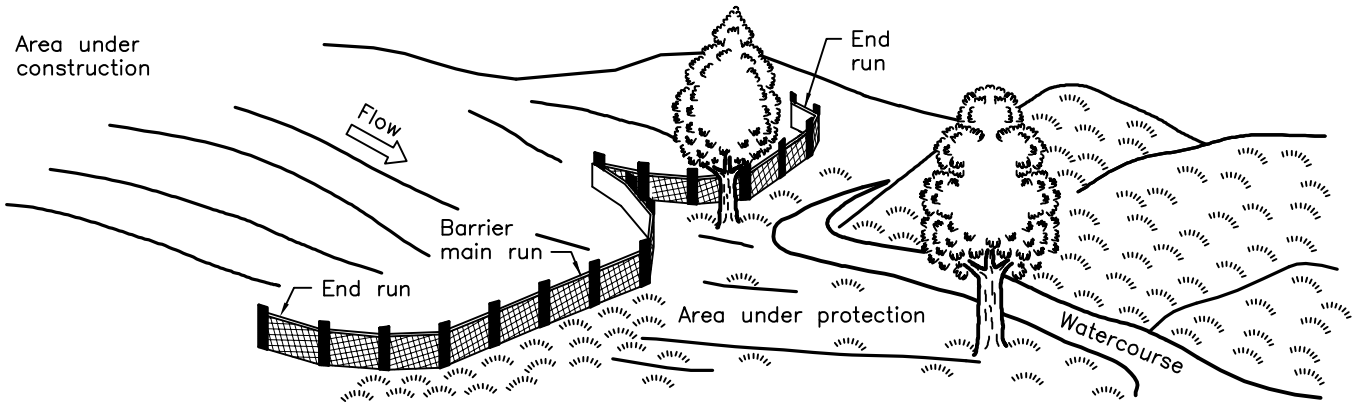
KINGDOM	Common Name	Scientific Name	SARO	SARA
	Common Mullein	Verbascum thapsus		
	Common Plantain	Plantago major		
	Common Prickly-ash	Zanthoxylum americanum		
	Common Self-heal	Prunella vulgaris ssp. vulgaris		
	Common Silverweed	Potentilla anserina ssp. anserina		
	Common Sow-thistle	Sonchus oleraceus		
	Common Speedwell	Veronica officinalis		
	Common St. John's-wort	Hypericum perforatum		
	Common Teasel	Dipsacus fullonum		
	Common Timothy	Phleum pratense		
	Common Vetch	Vicia sativa var. sativa		
	Common Viper's Bugloss	Echium vulgare		
	Common Yarrow	Achillea millefolium		
	Crested Wood Fern	Dryopteris cristata		
	Dark-green Bulrush	Scirpus atrovirens		
	Early Meadow-rue	Thalictrum dioicum		
	Eastern Buttonbush	Cephalanthus occidentalis		
	Eastern Hemlock	Tsuga canadensis		
	Eastern Poison Ivy	Toxicodendron radicans var. radicans		
	Eastern White Cedar	Thuja occidentalis		
	Eastern White Pine	Pinus strobus		
	European Buckthorn	Rhamnus cathartica		
	European Frog-bit	Hydrocharis morsus-ranae		
	European Mountain-ash	Sorbus aucuparia		
	Field Speedwell	Veronica agrestis		
	Field Woodrush	Luzula campestris		
	Fragrant Water-lily	Nymphaea odorata		
	Grass-leaved Goldenrod	Euthamia graminifolia		
	Grass-leaved Rush	Juncus marginatus		
	Hanging Bulrush	Scirpus pendulus		

KINGDOM	Common Name	Scientific Name	SARO	SARA
	Hemp Dogbane	Apocynum cannabinum		
	Knight's Plume Moss	Ptilium crista-castrensis		
	Lake Sedge	Carex lacustris		
	Low Pincushion Moss	Leucobryum albidum		
	Marsh Fern	Thelypteris palustris		
	Narrow-leaved Cattail	Typha angustifolia		
	New York Aster	Symphyotrichum novi-belgii		
	Northern Red Oak	Quercus rubra		
	Norway Spruce	Picea abies		
	Ostrich Fern	Matteuccia struthiopteris		
	Panicled Aster	Symphyotrichum lanceolatum		
	Paper Birch	Betula papyrifera		
	Pennsylvania Sedge	Carex pensylvanica		
	Red Ash	Fraxinus pennsylvanica		
	Red Maple	Acer rubrum		
	Red Raspberry	Rubus idaeus		
	Rice Cutgrass	Leersia oryzoides		
	Rough-leaved Mountain Rice	Oryzopsis asperifolia		
	Rough-stemmed Goldenrod	Solidago rugosa		
	Royal Fern	Osmunda regalis		
	Running Clubmoss	Lycopodium clavatum		
	Sensitive Fern	Onoclea sensibilis		
	Silver Maple	Acer saccharinum		
	Slender-leaved False Foxglove	Agalinis tenuifolia		
	Small Beggarticks	Bidens discoidea		
	Soft Rush	Juncus effusus		
	Southern Ground-cedar	Diphasiastrum digitatum		
	Speckled Alder	Alnus incana ssp. rugosa		
	Spinulose Wood Fern	Dryopteris carthusiana		
	Spotted Jewelweed	Impatiens capensis		

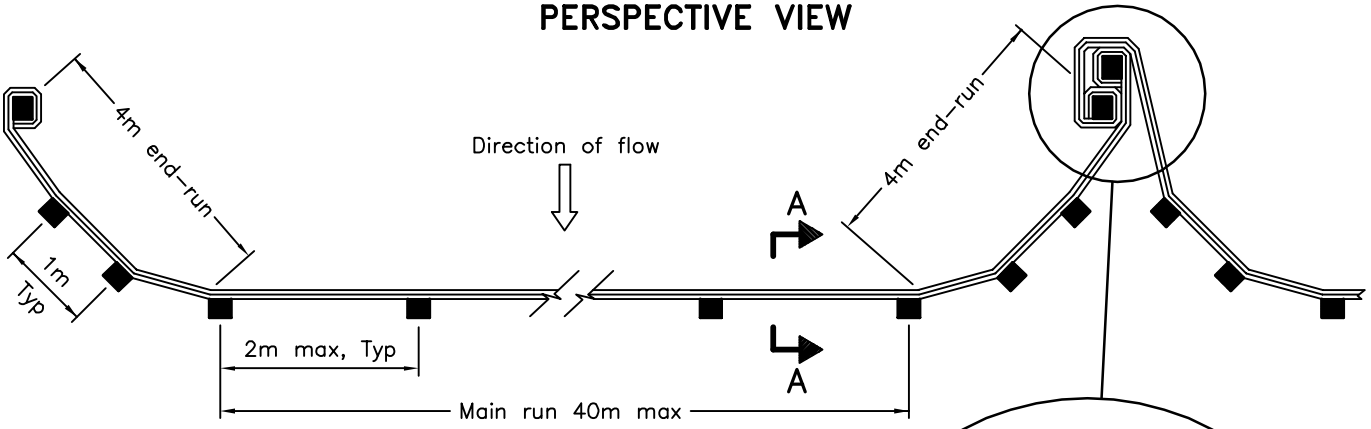
KINGDOM	Common Name	Scientific Name	SARO	SARA
	Staghorn Sumac	Rhus typhina		
	Sugar Maple	Acer saccharum		
	Swamp Dock	Rumex verticillatus		
	Tall Goldenrod	Solidago altissima		
	Tatarian Honeysuckle	Lonicera tatarica		
	Tussock Sedge	Carex stricta		
	White Ash	Fraxinus americana		
	White Elm	Ulmus americana		
	White Meadowsweet	Spiraea alba		
	White Spruce	Picea glauca		
	White Turtlehead	Chelone glabra		
	Wild Carrot	Daucus carota		
	Wild Chamomile	Matricaria chamomilla		
	Wild Chicory	Cichorium intybus		
	Wild Lily-of-the-valley	Maianthemum canadense ssp. canadense		
	Wild Raisin	Viburnum cassinoides		
	Wild Sarsaparilla	Aralia nudicaulis		
	Wild Strawberry	Fragaria virginiana ssp. virginiana		
	Yellow Birch	Betula alleghaniensis		

Appendix F

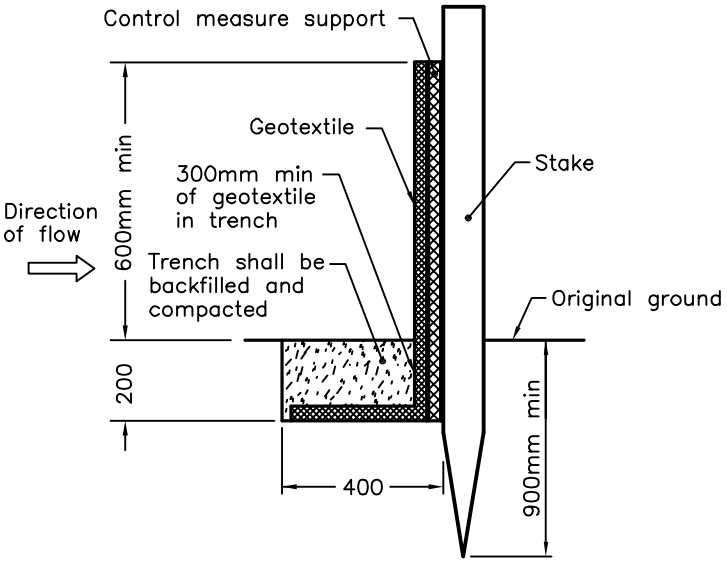
OPSD Heavy-duty Silt Fence



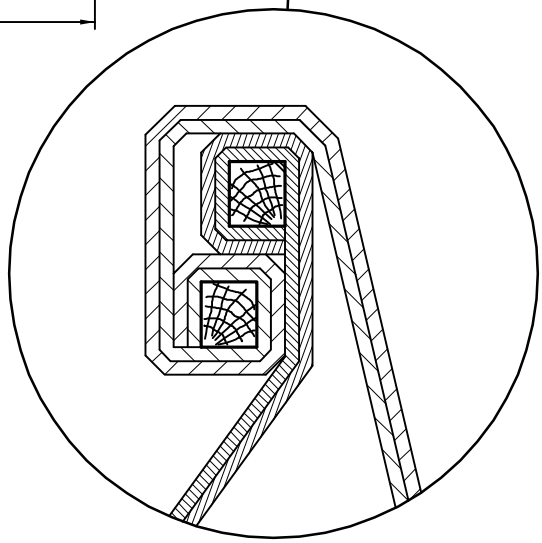
PERSPECTIVE VIEW



PLAN



SECTION A–A



JOINT DETAIL

NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
HEAVY–DUTY SILT FENCE BARRIER			
	OPSD 219.130		