Muncaster Environmental Planning Inc.

March 1, 2019

Ms. Michelle Taggart
Director Development
Tamarack (Nepean) Corporation
3187 Albion Road South
Ottawa, Ontario
K1V 8Y3

Dear Ms. Taggart:

RE: The Meadows, Barrhaven – Phases 7 & 8
Tree Conservation Report and Environmental Impact Statement - Updated

This Tree Conservation Report (TCR) and Environmental Impact Statement (EIS) addresses the existing vegetation, potential tree retention, Species at Risk utilization and other natural environment features such as significant woodlands at 3640 Greenbank Road in Barrhaven. This Phases 7 and 8 of the Meadows urban residential development is approximately 200 metres south of Cambrian Road, 300 metres east of Borrisokane Road, and one kilometre west of the current alignment of Greenbank Road. The future alignment of Greenbank Road will be along the east edge of the Phase 7 & 8 lands. The approximate 19.4 hectare site is described as part of Concession 3 (Rideau Front), Lots 9 and 10, Nepean Geographic Township, City of Ottawa.

Aggregate operations occurred in the west and central portions of the site until the early 1990s, with the east portion appearing to have been used for pasture with tree cover in the northeast. Since then tree cover has increased in the central and east portions of the site. A north-south wooden pole hydro line is along the east site edge. A berm is along much of the south property edge, with extensive aggregate operations to the south of the berm.

For the purposes of this report the existing Greenbank Road is assumed to be in a north-south orientation. This TCR/EIS has been updated to include the results of the 2018 field surveys, assess a revised Draft Plan of Subdivision and address comments from City staff.

Background and Project Description

Tamarack Homes is proposing to subdivide the site into lots intended to accommodate a total of 349 residential units, including 126 single detached dwellings, 181 townhomes, and 42 back-to-back townhomes. Additionally, the proposal includes one 2.8-hectare school block in the southwest portion of the site, and one 1.4-hectare parkland block in the centre (Map 2). The development of the subject property is expected to occur in two phases. The first phase will focus on the lands on the east side of the site and the second phase will focus on the west side.

Access to the site will be via the west side of the realigned Greenbank Road along the east edge of the site and a road from the north to be constructed as part of the Mattamy residential development to the north of the east portion of the site. The site will be on full municipal services as discussed in IBI (2018). Stormwater from the site will be directed to the storm sewers constructed by Mattamy Homes during the Phase 1 of the Half Moon Bay West development and the Clarke stormwater management pond to be constructed the north of Cambrian Road.

The site is designated *General Urban Area* on Schedule B of the City`s Official Plan, with a portion of the site in the northeast portion designated *Urban Natural Features.* This northeast portion of the site is also part of the Natural Heritage System, as shown on Schedule L2 of the Official Plan and is identified with an orange line on Map 1. The east portion of the site is zoned Development Review (*DR),* with the west portion zoned Mineral Reserve (*MR*). No constraints are shown for the site on Schedule K. As shown by the purple line on Map 1, much of the central and east portions of the site and lands to the north and northwest are part of the high-rated Cambrian Road Woods Urban Natural Area. There are no provincially significant wetlands or Areas of Natural and Scientific Interest in proximity to the site, with the closest feature the Twin Elms Moraine ANSI approximately 1.5 kilometres to the west.

Cambrian Road Woods Urban Natural Area

This high-rated 55.1 hectare site scored above average for the size and shape, regeneration, habitat maturity, wildlife habitat, and representative flora criteria, while the Natural Area was rated below average for the connectivity, natural communities and significant flora and fauna categories (Muncaster and Brunton, 2005). The level of disturbance was considered average. The mature coniferous swamp forest of white cedar, balsam fir and white spruce associated with seepage and spring areas reported in the Urban Natural Area site summary is to the northwest of this site, south of Cambrian Road. The swamp forest also contained the rare flora species reported in the Urban Natural Area site summary. The coniferous and mixed wetland swamps were considered high quality, with unusual vegetation associated with seepage and spring hydrology (Muncaster and Brunton, 2005). The flora of the Urban Natural Area represented a high native biodiversity and had a high native flora co-efficient of conservation and the impact of invasive plants was considered moderate. Raptors utilization was reported for the Urban Natural Area. The Cambrian Road Natural Area, as defined in the former Region of Ottawa-Carleton's Natural Environment System Strategy (NESS), was rated moderate overall relative to other sites in the entire area of the former Region (now City of Ottawa) (Brunton, 1997).

City of Ottawa staff in January 2006 defined a core forested area for the Cambrian Road Woods north and south of Cambrian Road to be protected through acquisition by the City. This area is to the northwest of the site and includes the swamp features described above. These lands are now zoned Environmental Protection (*EP1*) and abut the northwest site edge (Map 1).

Methodology

This EIS was prepared in accordance with Section 4.7.8 of the City of Ottawa Official Plan (2010) following the EIS Guidelines and the Guidelines for City of Ottawa Tree Conservation Reports, found at: http://ottawa.ca/en/development-application-review-process-0/environmental-impact-statement-guidelines and http://ottawa.ca/en/env_water/tlg/trees/preservation/guidelines/index.html, with guidance from the Natural Heritage Reference Manual (OMNR, 2010).

The major objective of this EIS is to determine the feature and functions of the on-site and adjacent natural environment conditions and to assess the anticipated impacts associated with the proposed development on these features and functions.

The following items were identified for particular attention in this EIS, recognizing that many of these issues are interrelated:

- what are the terrestrial habitat features of the site and adjacent lands and the associated sensitivities?
- is there any aquatic habitat potential on the site?
- as required what are the recommended areas of tree retention and other mitigation measures to avoid unacceptable impacts on any significant natural heritage features? and,
- does the site support any other significant natural heritage features, including Species at Risk and significant woodlands, that should be considered in development of the site?

Colour aerial photography (1976 - 2017) was used to assess the natural environment features in the general vicinity of the site. A field review of the site and adjacent lands was completed by Bernie Muncaster between 08:10 and 11:15 on July 20th, 2017 under partly cloudy skies, calm winds, and an air temperature of 24° C. This survey covered the entire site in a grid fashion to ensure all portions of the site were observed. Another survey of the central and east portions of the site was completed by Shaun St. Pierre between 06:45 and 10:45 on May 7th, 2018 (sunny skies, light breeze, and air temperatures between 5 and 12° C) to search for butternut, cavity trees, and other flora and fauna observations. The search area and adjacent lands was walked in a grid manner to ensure the search for butternut was complete. Following this survey, trees were removed from portions of the east and central parts of the site as outline in a Tree Cut Permit issued on April 30th, 2018. Approximately 6.4 hectares of the site was cut. The balance of the site and associated adjacent lands was surveyed by Shaun St. Pierre for butternuts, cavity trees, and other flora and fauna observations between 07:30 and 10:45 on August 16th, 2018 (sunny skies, light breeze, and air temperatures between 17 and 21° C).

The field survey and this report were completed by Bernie Muncaster, who has a Master's of Science in Biology and over thirty years of experience in completing natural environment assessments. The purpose of the Tree Conservation Report component is to assess the vegetation and determine which will be retained and protected on the site. The owner of the site is Taggart (Nepean) Corporation. It is proposed to remove the remaining woody vegetation not to be retained in 2019 before the breeding bird season.

Existing Conditions

Greater tree coverage is on the site following regeneration over the last three decades from extraction and agricultural land use. An elevated ridge is through the centre of the site running east-west prior to dropping down towards the excavated west portion of the site (Paterson, 2018). The property generally slopes from southwest to northeast with the lowest portion of the site being the northeast corner (IBI, 2018).

Paterson (2018) described the soil conditions as a thin layer topsoil followed be a layer of silty sand overlying either a sensitive silty clay deposit or a compact to dense glacial till and/or a loose, brown silty fine sand. Paterson (2018) concluded that the north and much of the central portion of the site (see Area 2 of Drawing PG4242- 3 in Appendix 2 of Paterson (2018)) would be subject to a maximum grade raise of one metre due to the sensitive silty clay layer. Based on available mapping, Paterson (2018) noted the bedrock is dolomite of the Oxford formation with an overburden drift thickness ranging between 15 and 25 metres. Groundwater levels were noted by Paterson (2018) at between 0.2 and 3.1 metres below ground elevation.

Ponded water was common in the excavated areas in the west portion of the site. A former north-south agricultural drain tributary of the Jock River, the West Clarke Municipal Drain, was along the east site edge. Flow entering this channel has been removed as a result of the adjacent urban residential developments. A temporary drainage system to replace the West Clarke Municipal Drain has been constructed, including along the east and east portion of the north site boundaries. The temporary drain continues to the north across the Mattamy lands and under Cambrian Road. The removal of 2.7 km of intermittent aquatic habitat of the channel to the Jock River to the north has been compensated for with a permanently wet outlet channel, designed with natural channel design principles, from the Clarke stormwater management pond and other fish habitat enhancements including construction of a large wetland area on the north side of the Jock River (west of the existing Foster Pond) (Stantec, 2007: Kilgour, 2017).

<u>Upland Poplar Deciduous Forest</u>

Trembling aspen is dominant in the deciduous forests in the east and northwest portions of the site, with other poplar species, balsam poplar, and eastern cottonwood well represented in areas (Photos 1 and 2). Green ash, white birch, grey birch, yellow birch, crack willow, bur oak, basswood, white cedar, white elm, Manitoba maple, and black cheery were also present. Much of the area was open in 1976 but a few older trees reflect the trees present at that time, including eastern cottonwood and white elm up to 70 cm diameter at breast height (dbh) (Photo 3) and crack willow in the 50cm – 60cm dbh range. The largest trembling aspen were in the 40cm to 45cm dbh range. Wind throw was extensive in many areas of the deciduous forest. Fungus was noted on many of the poplars with emerald ash borer and reduced leaf out on many of the ash trees. Stumps indicate historical selective logging in the deciduous forest was common.

Common and glossy buckthorn were dominant in much of the understory of the deciduous forests (Photo 4), with red raspberry, staghorn sumac, tartarian honeysuckle, red-osier dogwood, common juniper, grey dogwood, purple-flowering raspberry, wild gooseberry, wild currant, white elderberry, and wild raisin shrubs also present. Regenerating ash, poplar, white spruce,

Manitoba maple, and white elm stems were noted. Much of the ground flora in the deciduous forest was reflective of disturbed conditions including wild grape, thicket creeper, common strawberry, Canada goldenrod, small white aster, cow vetch, white avens, yellow wood sorrel, purple loosestrife, daisy fleabane, helleborine, filed horsetail, tall buttercup, bittersweet nightshade, heal-all, and enchanter's nightshade. White snakeroot, colt's-foot, lady fern, sensitive fern, ostrich fen, and fragile fern were also present.

Upland White Cedar Coniferous Forest

White cedar is dominant in the upland forests in the central portion of the site (Photo 5). The largest white cedars noted were in the 45cm to 50cm dbh range. White spruce was common in areas, ranging in size between 15cm and 32cm dbh. White birch up to 34cm dbh and smaller trembling aspen, balsam fir, and bur oak were also present. As with the deciduous forest to the east, wind throw was extensive in the coniferous forest (Photo 5). The understory was limited by the thickness of the cedar stems in many areas but included red raspberry, glossy buckthorn, common buckthorn, and grey dogwood. Examples of the ground flora were lady fern, ostrich fern, wild sarsaparilla, thicket creeper, wild grape, poison ivy, common burdock, and common strawberry.

Cultural Meadow

Pockets of cultural meadows and thickets are scattered through the site (Photos 6 and 7). Regenerated ground vegetation in the open areas included tall buttercup, common mullein, common plantain, red clover, white clover, black medic, bird's-foot trefoil, brome grass, meadow grass**,** wild parsnip, Philadelphia fleabane, ox-eye daisy, curled dock, evening primrose, wild parsnip, common yarrow, wild grape, chicory, heal-all, wild carrot, Canada goldenrod**,** Canada thistle, field sow-thistle**,** purple loosestrife, common ragweed, common milkweed, silvery cinquefoil, common burdock, and common mugwort.

Woody vegetation in the cultural habitats included staghorn sumac, red raspberry, common buckthorn, tartarian honeysuckle, nannyberry, Bebb's willow, and slender willow shrubs were common in the meadow habitat along with regenerating poplar and ash stems. Where the shrub cover was greater than 25 percent but the tree cover less than 25 percent, the cultural habitat is shown as a cultural thicket on Map 1.

Cultural Woodland

Areas with trees, but where the coverage is less than 60 percent, are identified as cultural woodlands on Map 1 (Photo 8). Trembling aspen, white cedar, Manitoba maple and white elm were common along with common buckthorn, red raspberry and staghorn sumac shrubs. Canada goldenrod, small white aster, common ragweed, common burdock, and ox-eye daisy were well established in the ground flora.

Cattail Marsh and Meadow Marsh

Pockets of wetland habitat have developed in some of the former aggregate areas (Photo 9). Broad-leaved cattail was dominant in areas, with purple loosestrife, fowl manna grass, reed canary grass, slender willow and glossy buckthorn well represented in others. Standing water was common in some of the marshes during the July, 2017 survey, but not present in the wetland parcels on August 16th, 2018 except the west representation.

Wildlife observed on and adjacent to the site included ring-billed gull, turkey vulture, red-winged blackbird, American goldfinch, song sparrow, chipping sparrow, black-capped chickadee, white-breasted nuthatch, downy woodpecker, northern flicker, American woodcock, yellow warbler, common yellowthroat, great-crested flycatcher, least flycatcher, American robin, American crow, blue jay, northern cardinal, Baltimore oriole, rose-breasted grosbeak, grey squirrel, white-tailed deer tracks, and beaver cuttings. Two white cedars, one in the northwest and one in the north-central, contained cavities which could be used by bats or other wildlife, although there was no evidence these cavities were being used. No stick nests or other evidence of raptor utilization were observed on the site. Road noise from Highway 416 was noticed through the site.

The northwest portion of the site is adjacent to the core area of the Cambrian Road Woods to be retained. However, no natural areas are to the south, west or east of the site, with extensive aggregate operations, the Highway 416 corridor, and an urban residential portion of Barrhaven in these directions, respectively. Thus, the site is not anticipated to perform a significant linkage function as there are no natural areas to travel from and through the site to the Cambrian Road Woods.

Photo 1 – Typical condition of the poplar deciduous forest in the southwest portion of the site.

Photo 2 – Another view of the poplar deciduous forest – this example is the forest edge in the northwest portion of the site.

Photo 3 – Largest tree observed was a 70cm dbh eastern cottonwood in the east portion of the site

Photo 4 – Buckthorn was dominant in the understory of many areas of the deciduous forest. This example is in the east portion of the site.

Photo 5 – Windthrow is common in the on-site forests. This example is in the cedar coniferous forest in the north-central portion of the site.

Photo 6 – Cultural meadows are scattered through the site.
This example is in the southeast portion of the site with view looking north

Photo 7 – Meadow habitat dominated by common ragweed on former extraction area in the northwest portion of the site

Photo 8 –Cultural woodlands in the west portion of the site

Photo 9 – Meadow marsh in the west portion of the site. View looking south

Species at Risk

No Species at Risk were observed during the field survey. On July 18th, 2017 MNRF's Make a Map: Natural Heritage Areas website was reviewed (www.giscoeapp.lrc.gov.on.ca/web/MNR/NHLUPS/NaturalHeritage/Viewer/Viewer.html). This site allows for a search of Threatened and Endangered species covered by the 2008 *Endangered Species Act*, as well as other species of interest. A search was conducted on the 1 km squares including the site and adjacent areas (18VR41-10 and -20). No Species at Risk were identified for these 1 km squares, with one provincially rare fish species, greater redhorse. Greater redhorse utilizes clear, relatively fast-moving rivers and is known from the Rideau River, approximately three kilometres to the east of the site. No suitable aquatic habitat is on or adjacent to the site for this species

The breeding birds listed in the Ontario Breeding Bird Atlas for the 10 km square 18VR41 identified barn swallow, bank swallow, chimney swift, eastern meadowlark, and bobolink as Species at Risk in the overall 10 km square including the site. Bobolink and eastern meadowlark utilize large grassland areas including hay fields. The on-site meadow habitats are much too small to provide nesting habitat for these grassland Species at Risk. Barn swallows feed in open areas and nest in structures with accessible rafters such as barns, storage sheds, and the underside of bridges. Chimney swifts nest predominantly in open chimneys and historically in tree hollows. No structures are present on or adjacent to the site. Bank swallow is a colonial nester; burrowing in eroding silt or sand banks and sand pit walls; exposed sand habitat was not present on the site.

Blanding's turtle, butternut, eastern whip-poor-will, northern long-eared bat, eastern small-footed myotis, little brown bat, and tri-coloured bat were other Species at Risk identified in MNRF correspondence (Appendix A) that may be found in the general area of the site. No butternuts were observed on or within 50 metres of the site. The small wetland habitats in former aggregate areas are considered too small to be suitable Blanding's turtle habitat and lack structure such as sunning logs. No Blanding's turtle sightings have been reported within two kilometres of the site (Kilgour, 2017). The two white cedar cavity trees are well less than the 10 suitable cavity trees per hectare for an area to be considered a candidate for bat summer maternity colonies. No caves and mines, used for overwintering by bats, are not present. The understory in the on-site forests appears too thick for utilization by eastern whip-poor-will, which utilize rock or sand barrens with scattered trees, savannahs, old burns, or other disturbed sites in a state of open early to mid-forest succession, or open conifer plantations.

The site summary by Muncaster and Brunton (2005) describes the Cambrian Road Woods area as having an exceptional floristic diversity of uncommon native flora. Unusual vegetation and flora associated with seepage and spring hydrology was in a portion of the woods northwest of the site and south of Cambrian Road within the Environmental Protection zone. The unusual vegetation included one regionally rare plant species (a sedge - *Carex prasina*) and three regionally uncommon plant species (a sedge - *Carex magellenica*, rose twisted-stalk and highbush blueberry), as well as the possible presence of northern avens (Muncaster and Brunton, 2005).

The potential Species at Risk in the City of Ottawa were also reviewed. Endangered and threatened species reported in the overall City include butternut, American ginseng, eastern prairie fringed-orchid, wood turtle, spiny softshell, Blanding's turtle, musk turtle, Henslow's sparrow, loggerhead shrike, little brown myotis, northern long-eared bat, olive hickorynut, chimney swift, eastern meadowlark, barn swallow, bank swallow, bobolink, eastern whip-poor-will, bald eagle, golden eagle, cerulean warbler, least bittern, eastern cougar, lake sturgeon and American eel.

The habitat requirements of the above species along with those listed as special concern were reviewed. The only Species at Risk considered to have the potential to be on the lands site is butternut, which is found in a variety of habitats in the Ottawa area. No butternuts were observed during the three field surveys on and adjacent to the site.

Significant Wildlife Habitat

The potential for significant wildlife habitat was assessed using the guidance in OMNR (2010) and MNRF (2015). Potential components which may lead to a designation of significant wildlife habitat include seasonal concentration areas of animals, rare vegetation communities or specialized habitat for wildlife, habitat for species of conservation concern and animal movement corridors.

Some amphibian use may be occurring in the former excavation areas which are now meadow marshes. The extent of amphibian use is not anticipated to be significant as the marsh habitats are human-made features resulting from excavation, they are no inlets or outlets, and adjacent spoil piles are extensive in areas. No other field observations which would trigger a significant wildlife habitat designation with respect to the ELC communities present were noted. For example, the cultural habitats do not support waterfowl stopover or staging areas, colonial nesting bird breeding habitat, or other examples of seasonal concentration areas. No rare vegetation communities as noted in MNRF (2015), Provincially rare species, evidence of animal movement corridors, or rare or specialized habitats were observed. No old growth forest or forest interior habitat are present, although some older mapping does show forest interior habitat for the site when the lands to the north of the east portion of the site were wooded. Due to the lack of forest interior habitat, potential Species of Special Concern such as eastern wood pewee and wood thrush are not anticipated to nest in the on-site forests. No potential bat hibernacula or large cavity trees for potential maternity colonies were observed. The areas of the Cambrian Road Woods with seepage and spring hydrology and associated unique flora and fauna are to the northwest of the site closer to Cambrian Road. Areas of broken and fissured rock for potential use by snakes, including potential reptile hibernaculum, were not observed. No stick nests or other evidence of raptor utilization was observed.

As described above, no significant linkage functions are anticipated for the site due to the adjacent aggregate operations, Highway 416 corridor, and urban residential developments.

Significant Woodlands

The significance of woodlands is evaluated using the criteria in the Natural Heritage Reference Manual (OMNR, 2010). The on-site forests have reduced function due to their relatively young age, extensive non-native flora in many areas, lack of forest interior habitat, historical logging and extensive wind throw. However, the forests are contiguous with forests to the northwest which have many more features and functions as described in Muncaster and Brunton (2005) and Kilgour (2017). The overall contiguous forest is approximately 30 hectares, less than the 50 hectare threshold required in OMNR (2010) for the 42 percent tree cover in the Jock River subwatershed. The amount of forest interior habitat in the contiguous forest to the north is less than two hectares, also less than the applicable eight hectare threshold. However, uncommon characteristics of the contiguous forest, including the swamps and associated hydrology would result in the overall contiguous forest assessed as a significant woodlands. Mapping by Kilgour (2017) indicate that the closest swamp habitat is approximately 140 metres to the northwest of the northwest corner of the site. As the uncommon characteristics are to the north of the site and given the distance and lack of hydrological connection, the contiguous forest to the north will continue to function as a significant woodlands following removal of the on-site forests as part of the proposed development.

Impact Analysis and Recommendations

The significant woodlands on and adjacent to the site are the only natural heritage features, as identified in the Provincial Policy Statement and OMNR (2010), noted for the site. As assessed removal of the disturbed on-site forests will not impact the ability of the overall contiguous forest to function as a significant woodlands and the core area and key features of the associated Urban Natural Area will be retained.

Important mitigation measures are presented in this section to protect the adjacent Environmental Protection lands to the north of the west portion of the site, and the environment in general. The portion of the site that abuts the Environmental Protection lands was not treed in 1976 and thus the adjacent vegetation to the north is not anticipated to be sensitive to removal of the on-site regenerating vegetation and associated potential impacts such as wind throw and sunscald.

The minimal amount of forest interior habitat in the Environmental Protection lands to the northwest of the site begins 100 metres east of Borrisokane Road and 100 metres south of Cambrian Road. Most of the west edge of the site closest to this area is not forested, with the removal of the on-site forest not impacting the forest interior habitat to the northwest.

The project engineer from Paterson Group provided the following response to address groundwater movement and potential impacts on the wetland habitat within the Environmental Protection lands to the northwest of the site:

Based on the soil profile and anticipated grading, the development will be well above the existing groundwater table, so a significant lowering of the groundwater table is not anticipated within the northwest portion of the site. The wetland area to the northwest of the site is over a silty clay deposit that has limited water infiltration, so groundwater lowering at the Meadows

Phase 5 site, if any, would not impact the presence of perched water within the wetland area to the northwest. The groundwater movement within the Meadows Phase 5 site is heavily influenced by the deep silty clay deposit to the north, which limits movement to the north with the exception of groundwater movement through the glacial till deposit underlying the silty clay layer. Generally, the water table would build up in the sand below the Meadows Phase 5 site and move east and west with some minor movement to the north.

The project engineer from Paterson Group provided the following response to address potential changes in the water budget of the Cambrian Woods woodlot due to an increase in the post-development surface elevation of the site:

The current water sources contributing to the Cambrian Woods woodlot to the northwest of the site are comprised primarily of surface water runoff from the rural lands to the south of the woodlot and west of the proposed development, as well as the Ottawa Valley Kars Esker that will continuously transmit large quantities of groundwater to the woodlot. Due to the impervious nature of the clay soil and existing lower ground surface elevation on the proposed development lands relative to the Cambrian Woods woodlot, it is expected that pre-development surface water infiltration is currently minimal with the majority of the water being directed away from the woodlot as runoff towards the east, south and west. Although the elevation of the site will rise with the required grade raises, this will not increase the extent of surface runoff directed towards the Cambrian Woods woodlot as the stormwater associated within the proposed urban development will be collected in the site servicing infrastructure and removed off-site to the east for treatment. As with the current condition, the surface runoff from the site will not contribute to the water budget of the woodlot. Therefore, the proposed residential development is not anticipated to impact the post-development water balance of the Cambrian Woods woodlot.

No Species at Risk were observed and no natural channels with aquatic habitat potential were observed.

Potential impacts during construction and operation of the residential development include impacts on wildlife from vegetation removal, increased erosion and release of sediments and other potential contaminants from truck traffic and construction activity, harm to wildlife remaining in the work area during construction, and impacts associated with an increase in noise, dust and light. Some amphibian use may be occurring in the former excavation areas which are now meadow marshes. As this habitat will be removed, it is important the marshes are searched for amphibians during the active period for amphibians. The following mitigation measures are recommended to address these potential impacts during construction and operation of the residential development:

<u>Recommended Mitigation Measures</u>

1. Due to the anticipated grading and other servicing requirements for the urban residential development no tree retention is anticipated for the site. Figure 5.1 in Appendix E of IBI (2018) identifies grade raises of at least one metre for much of the site. Plantings of native vegetation are recommended as part of the development, especially infill plantings to re-establish native vegetation along new and disturbed edges adjacent to the natural

features to remain to the north. Lands owned by the applicant to the west of this site will not be disturbed at this time. Plantings are also recommended along the west edge of the site to minimize impacts on the lands outside of the Plan of Subdivision, though the lands immediately to the west are not heavily treed. Planting details will be provided on a Landscape Plan to be produced as a draft condition.

Potential native species to plant include nannyberry, elderberry and dogwood shrubs along with sugar maple, red maple, basswood, balsam fir, bur oak, tamarack, and white spruce trees. Sourcing native species from local seed sources is strongly recommended to ensure adaptability and longevity. In areas where the root structures may reach clay soils, tree and shrub species that have a high water demand are not recommended. These species include willows, poplars, and elm. Also, Paterson (2018) noted that limiting planting of trees to areas away from the buildings may reduce the impacts of the proposed development on the long-term groundwater level.

2. Due to the sensitive clay soils, Paterson (2018) identified tree planting setback areas for the north and much of the central portion of the site (see Area 2 of Drawing PG4242- 3 in Appendix 2 of Paterson (2018)). The tree planting setback recommendations by Paterson (2018) included large trees (mature height over 14 m) can be planted within Area 2 provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g. in a park or other green space). Paterson (2018) noted that the tree planting setback limits may be reduced to 4.5 m for small (mature tree height up to 7.5m) and medium size trees (mature tree height 7.5 m to 14 m) provided that the conditions with respect to available soil volume, mature tree size, local grading, and reinforced foundation walls are met as outlined in Section 6.7 of Paterson (2018). No tree planting setbacks were recommended for the south and portions of the central part of the site due to the lack of sensitive clay deposits (see Area 1 on Drawing PG4242- 3).

3. To further reduce the impacts on the long-term groundwater level Paterson (2018) also recommended placing clay dykes in the service trenches, reducing the sizes of paved areas, and leaving green spaces, such as the park and school fields, to allow for groundwater recharge. This is anticipated to avoid potential indirect impacts on the coniferous swamp forest to the northwest of the site within the Environmental Protection lands.

4. To provide sediment and erosion control, delineate the work area, and protect adjacent vegetation and their associated critical root zones, silt fencing is to be installed along the perimeter of the work areas. The fencing will be placed by a qualified contractor before additional site alterations occur at the outside edge of the critical root zones of the adjacent trees to protect, which is defined as ten time the tree trunk diameter. The fencing must be properly keyed in to filter runoff and assist in keeping wildlife out of the work area. The fencing will need to be maintained as required including repair of broken sections and removal of accumulated sediment. The fencing will be inspected frequently, at least weekly and after every storm event. Signs, notices or posters are not to be attached to any tree. No grading, heavy machinery traffic, stockpiling of material, machinery maintenance and refueling or other activities that may cause soil compaction

are to occur outside of the work areas delineated by the silt fencing. The root system, trunk or branches of the trees to be retained are to be protected and not damaged. If any roots of trees to be retained are exposed during site alterations, the roots shall be immediately reburied with soil or covered with filter cloth, burlap or woodchips and kept moist until the roots can be buried permanently. A plastic covering should be used to retain moisture during an extended period when watering is not possible. Any roots that must be cut are to be cut cleanly to facilitate healing and as far from the tree as possible. Exhaust fumes from all equipment during construction will not be directed towards the canopy of trees to be retained. The silt fencing is to be retained and kept in proper working order until all site servicing and construction has been completed and the site has been stabilized.

5. Once the fencing has been installed, prior to any site disturbances the work area is to be thoroughly searched and any wildlife at risk including turtles and snakes are to be safely relocated to the Environmental Protection lands to the north. Animals should be moved only far enough to ensure their immediate safety. See Appendix 1 and the links in Section 4 of City of Ottawa (2015) for suggestions on how to effectively relocate turtles and snakes.

6. To protect breeding birds, the woody vegetation removal should not occur between April 15th and August 15th, unless a breeding bird survey conducted by a qualified biologist within five days of the woody vegetation removal identifies no active nests in the trees or shrubs. An important note is that is can be very difficult in forests with a thick understory to determine if bird nests are present in the upper portions of the canopy. Although not anticipated to utilize the site, by removing trees outside of the nesting period, if potential Species of Special Concern such as eastern wood pewee and wood thrush are utilizing the site, the individuals will not be harmed and remaining habitat to the northwest can be utilized;

7. The woody vegetation removal is to be cleared such that existing connections to adjacent areas of natural habitat are maintained until the final stage of clearing, so that wildlife can use these connections to leave the site. This involves clearing the trees and shrubs from east to northwest as has been done by the existing vegetation removal;

8. Prior to filling in the former excavation areas which are now meadow marshes, these areas are to be searched for amphibians during the active period from May 1st to October 15th. Amphibians present are to be relocated to suitable habitat within the Jock River corridor to the north. Once the former excavation areas have been cleared of any amphibians, it is important that these areas are immediately filled in or otherwise altered so there is no potential for amphibians to return;

9. Many helpful wildlife oriented mitigation measures are detailed in the City's Protocol for Wildlife Protection during Construction (City of Ottawa, 2015). The contractor is to be aware of the potential Species at Risk in the vicinity of the site including butternut. Appendix 1 of City of Ottawa (2015) describes these species. Bernie Muncaster (613-748-3753) is project biologist for this development. Any Species at Risk sightings are to

be immediately reported to the project manager and the MNRF and work that may impact the species suspended immediately; and,

10. As recommended in the City of Ottawa (2015) prior to beginning work each day, the work areas are to be checked for wildlife by conducting a thorough visual inspection of the work space and immediate surroundings. See Section 2.5 of the City's Protocol for Wildlife Protection during Construction (City of Ottawa, 2015) for additional recommendations on construction site management.

Additional recommended mitigation measures for sediment and erosion control and general environmental protection include:

- Any groundwater that must be removed from the work areas will be pumped into a proper filter mechanism such as a sediment trap or filter bag prior to release to the environment;
- The extent of exposed soils is to be kept to a minimum at all times. Re-vegetation of exposed, non-developed areas is to be achieved as soon as possible. The objective with respect to erosion and sediment controls will be to ensure that the surface water runoff leaving the site is not degraded with respect to water quantity or quality. Erosion and sediment control will focus on best management practices such as grassed swales with a reduced slope, and direction of roof runoff to grass or other permeable surfaces;
- During construction, seepage barriers such as silt fencing, straw bale check dams and other sediment and erosion control measures will be installed as required to OPSD requirements in any temporary drainage ditches and around disturbed areas during construction and stockpiles of fine material. These control measures must be properly maintained to maximize their function during construction;
- Municipal by-laws and provincial regulations for noise will be followed and utilities will be located as required in the vicinity of the site prior to construction; and,
- Waste will be managed in accordance with provincial regulations. The contractor will have a spill kit on-hand at all times in case of spills or other accidents.

Schedule of Proposed Works

The remaining woody vegetation not to be retained is proposed for removal in 2019, before the breeding bird season. An additional Tree Cut Permit will be required for removal of trees on private land that are greater than 10cm dbh. City of Ottawa staff (Forester – Planning) is to be contacted at least two business days prior to any tree removal so that staff have the opportunity to verify that the protective fencing, if applicable, has been properly constructed.

Cumulative Effects

The Canadian Environmental Assessment Agency (CEAA) defines cumulative effects as…"*the effects on the environment caused by an action in combination with other past, present, and future human actions*…" They occur when two or more project-related environmental effects, or two or more independent projects, combine to produce an augmented effect. These cumulative effects may be positive or negative.

The site has been historically disturbed through aggregate extraction and agricultural use. Removal of younger forests with extensive wind throw, non-native vegetation and historical logging will occur. It is anticipated that wildlife using these areas will relocate to the Environmental Protection lands on both sides of Cambrian Road and not be impacted provided the important mitigation measures in this report are properly implemented. No significant cumulative effects are anticipated on the general landscape as a result of the proposed development.

Conclusion

The site has a high level of historical disturbance through aggregate extraction and agricultural. The on-site forests have reduced function due to their relatively young age, extensive non-native flora in many areas, lack of forest interior habitat, historical logging and extensive wind throw. The forests are connected with less disturbed woods with more ecological features and functions to the northwest of the site. These forests will be retained and the overall contiguous forest would be considered a significant woodlands. The assessment in this report concludes that with proper implementation of the recommended mitigation measures removal of the on-site forests will not impair the ability of the remaining forests to the north to function as a significant woodlands. No Species at Risk were observed or are anticipated for the site other than butternut. No butternut was observed.

It is important that the mitigation measures outlined in this EIS and TCR are properly implemented and maintained.

References

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City of Ottawa. 2010. City of Ottawa Official Plan. As adopted by City Council, May, 2003 and Updated 2010. Publication: 1-28. 227 pp & Sched.

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IBI Group. 2018. Assessment of Adequacy of Public Services. The Meadows in Half Moon Bay - Phase 5. Project: 115496-5.2.2. December, 2018. 16 pp. & Append.

Kilgour & Associates Limited. 2017. Environmental Impact Statement. Mattamy – Half Moon Bay West. November 16, 2017. 31 pp. & Append.

Ontario Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. March 2010. 233 pp.

Ontario Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. January, 2015. 38 pp.

Paterson Group. 2018. Geotechnical Assessment, Proposed Residential Dev, The Meadows Phase 5. Cambrian Road - Ottawa. March 16, 2018. Report: PG4242-1. 23 pp. & Append.

Stantec Consulting. 2007. Jock River Reach One Subwatershed Study. Final Report, June 2007. 8 Sections & append.

Please call if you have any questions on this updated EIS and Tree Conservation Report.

Yours Sincerely,
MUNCASTER ENVIRONMENTAL PLANNING INC.

Bernie Muncaster, M.Sc.
Principal

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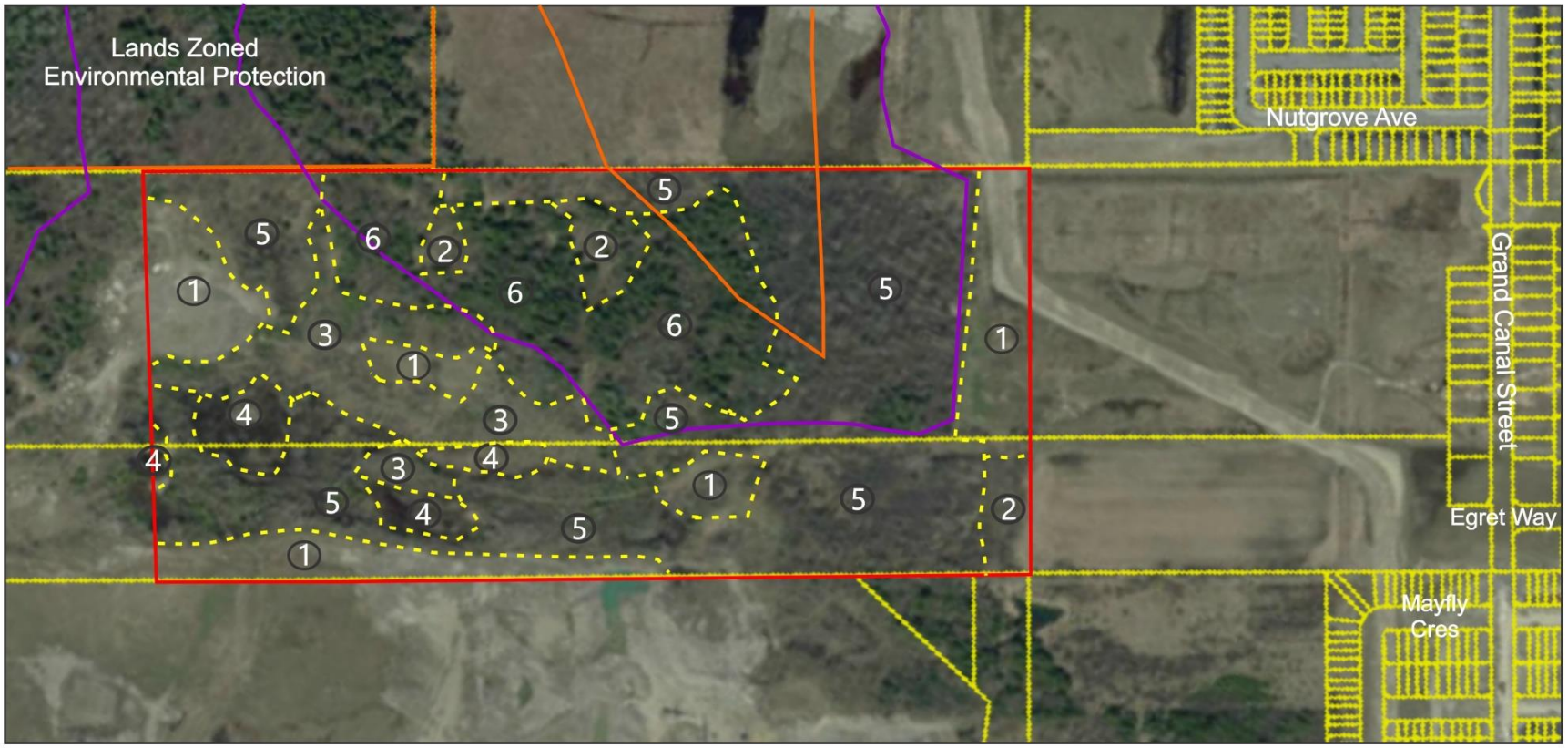


Legend

- Phase 5 Lands
- Cambrian Road Woods Urban Natural Area
- Natural Heritage System per Schedule L2

Vegetation Communities

1. Cultural meadow
2. Cultural thicket
3. Cultural woodland
4. Meadow marsh
5. Upland poplar deciduous forest
6. Upland cedar coniferous forest

2014 airphoto base from geoOttawa

Approx. Scale 1:5,000

0 50 100 150 200
METRES

August 30, 2018 | **FILE: 09-31** | **Map 1**

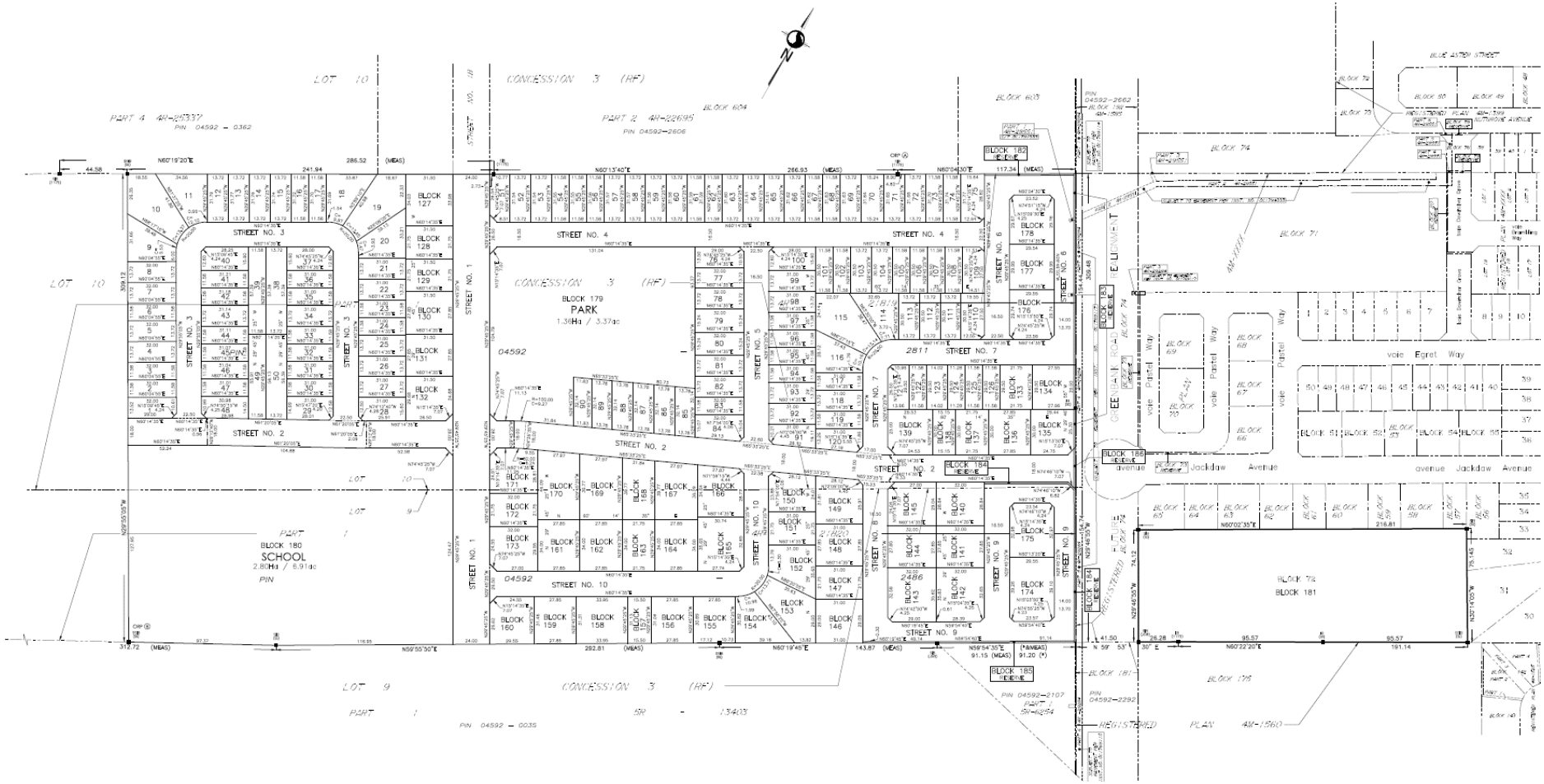
Prepared for: Tamarack (Nepean) Corporation

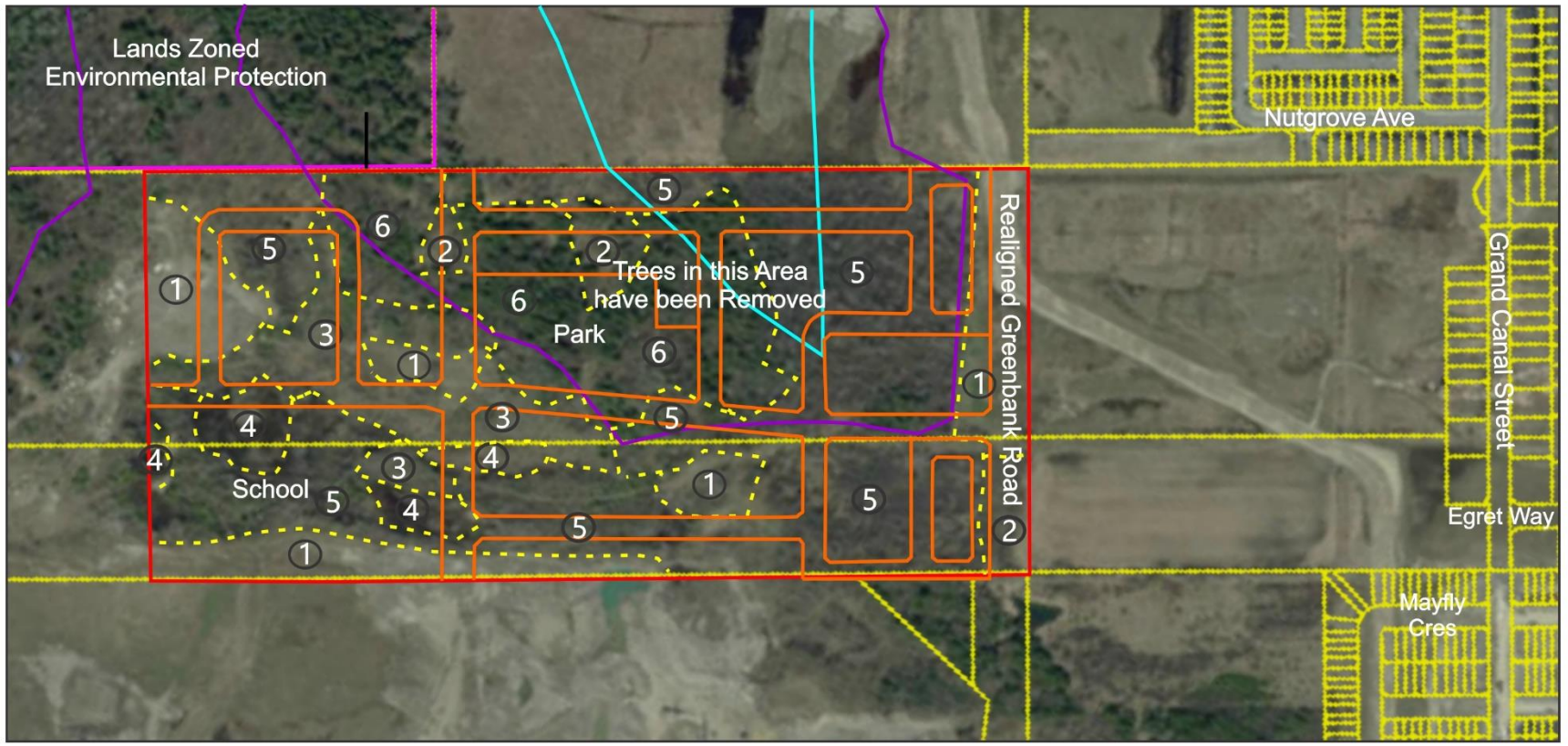
Prepared by: Muncaster Environmental Planning Inc.

NATURAL ENVIRONMENT FEATURES

THE MEADOWS, PHASES 7 & 8
BARRHAVEN SOUTH, CITY of OTTAWA

MAP 2 – PLAN OF SUBDIVISION





Legend

- Phase 5 Lands
- Cambrian Road Woods Urban Natural Area
- Natural Heritage System per Schedule L2

Note: Due to Significant Grade Raises and Other Urban Servicing Constraints No Tree Retention is Anticipated

Vegetation Communities

1. Cultural meadow
2. Cultural thicket
3. Cultural woodland
4. Meadow marsh
5. Upland poplar deciduous forest
6. Upland cedar coniferous forest

2014 airphoto base from geoOttawa

Approx. Scale 1:5,000

0 50 100 150 200 METRES

November 23, 2018 | FILE: 09-31 | Map 3

Prepared for: Tamarack (Nepean) Corporation

Prepared by: Muncaster Environmental Planning Inc.

PROPOSED CONSERVED VEGETATION

THE MEADOWS, PHASES 7 & 8
BARRHAVEN SOUTH, CITY of OTTAWA

APPENDIX A

MINISTRY of NATURAL RESOURCES and FORESTRY

CORRESPONDENCE

Ministry of Natural Resources and Forestry

Kemptville District

10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts

District de Kemptville

10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Mon. Aug 21, 2017

Bernie Muncaster
Muncaster Environmental Planning Inc.
491 Buchanan Crescent
Ottawa
K1J 7V2
(613) 748-3753
bmuncaster@rogers.com

Attention: Bernie Muncaster

Subject: Information Request - Developments
Project Name: Halfmoon Bay West - Meadows Phase 4
Site Address: 3640 Greenbank Rd, Ottawa
Our File No. 2017_NEP-4177

Natural Heritage Values

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

The following Natural Heritage values were identified for the general subject area:

- Fish Nursery, Brook Stickleback Nursery Area (Non-Sensitive)
- Fish Nursery, White Sucker Nursery Area (Non-Sensitive)
- Lake (Non-Sensitive)
- Pit, 4074 (Non-Sensitive)
- Pit, 4219 (Non-Sensitive)
- Pond (Non-Sensitive)
- Private Drain, Clarke East Drain (Non-Sensitive)
- Private Drain, Clarke West Drain (Non-Sensitive)
- Private Drain, Todd Drain (Non-Sensitive)
- River, Jock River (Non-Sensitive)
- Spawning Area, Pumpkinseed Spawning Area (Non-Sensitive)
- Spawning Area, Shorthead Redhorse Spawning Area (Non-Sensitive)
- Spawning Area, Smallmouth Bass Spawning Area (Non-Sensitive)
- Spawning Area, Walleye Spawning Area (Non-Sensitive)
- Unevaluated Wetland (Not evaluated per OWES)

Municipal Official Plans contain information related to natural heritage features. Please see the local municipal Official Plan for more information, such as specific policies and direction pertaining to activities which may impact natural heritage features. For planning advice or Official Plan interpretation, please contact the local municipality. Many municipalities require environmental impact studies and other supporting studies be carried out as part of the development application process to allow the municipality to make planning decisions which are consistent with the Provincial Policy Statement (PPS, 2014).

The MNRF strongly encourages all proponents to contact partner agencies and appropriate municipalities early on in the planning process. This provides the proponent with early knowledge regarding agency requirements, authorizations and approval timelines; Ministry of the Environment and Climate Change (MOECC) and the local Conservation Authority may require approvals and permitting where natural values and natural hazards (e.g., floodplains) exist.

As per the Natural Heritage Reference Manual (NHRM, 2010) the MNRF strongly recommends that an ecological site assessment be carried out to determine the presence of natural heritage features and species at risk and their habitat on site. The MNRF can provide survey methodology for particular species at risk and their habitats.

The NHRM also recommends that cumulative effects of development projects on the integrity of natural heritage features and areas be given due consideration. This includes the evaluation of the past, present and possible future impacts of development in the surrounding area that may occur as a result of demand created by the presently proposed project.

In Addition, the following Fish species were identified: banded killifish, blackchin shiner, blacknose shiner, bluegill, bluntnose minnow, brassy minnow, bridle shiner, brook stickleback, brown bullhead, Carps and Minnows, central mudminnow, common carp, common shiner, creek chub, fallfish, fathead minnow, finescale dace, golden shiner, greater redhorse, hornyhead chub, johnny darter, johnny darter/tesselated darter, logperch, longnose dace, mottled sculpin, muskellunge, northern pike, northern redbelly dace, pumpkinseed, rock bass, shorthead redhorse, silver redhorse, smallmouth bass, spottail shiner, stonecat, Unidentifiable, walleye, white sucker.

Wildland Fire

MNRF woodland data shows that the site contains woodlands. The lands should be assessed for the risk of wildland fire as per PPS 2014, Section 3.1.8 "*Development shall generally be directed to areas outside of lands that are unsafe for development due to the presence of hazardous forest types for wildland fire. Development may however be permitted in lands with hazardous forest types for wildland fire where the risk is mitigated in accordance with wildland fire assessment and mitigation standards*". Further discussion with the local municipality should be carried out to address how the risks associated with wildland fire will be covered for such a development proposal. Please see the Wildland Fire Risk Assessment and Mitigation Guidebook (2016) for more information.

Significant Woodlands

Section 2.1.5 b) of the PPS states: *Development and site alteration shall not be permitted in significant woodlands unless it has been demonstrated that there will be no negative impacts on*

the natural features or their ecological functions. The 2014 PPS directs that significant woodlands must be identified following criteria established by the Ontario Ministry of Natural Resources and Forestry, i.e. the Natural Heritage Reference Manual (NHRM), 2010. Where the local or County Official Plan has not yet updated significant woodland mapping to reflect the 2014 PPS, all wooded areas should be reviewed on a site specific basis for significance. The MNRF Kemptville District modelled locations of significant woodlands in 2011 based on NHRM criteria. The presence of significant woodland on site or within 120 metres should trigger an assessment of the impacts to the feature and its function from the proposed development.

Significant Wildlife Habitat

Section 2.1.5 d) of the PPS states: *Development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.* It is the responsibility of the approval authority to identify significant wildlife habitat or require its identification. The MNRF has several guiding documents which may be useful in identification of significant wildlife habitat and characterization of impacts and mitigation options:

- Significant Wildlife Habitat Technical Guide, 2000
- The Natural Heritage Reference Manual, 2010
- Significant Wildlife Habitat Mitigation Support Tool, 2014
- Significant Wildlife Habitat Criteria Schedule for Ecoregion 5E and 6E, 2015

The habitat of special concern species (as identified by the Species at Risk in Ontario list) and Natural Heritage Information Centre tracked species with a conservation status rank of S1, S2 and S3 may be significant wildlife habitat and should be assessed accordingly.

Water

If any in-water works are to occur, there are timing windows for which work in water should not take place (see below). Appropriate measures should be taken to minimize and mitigate impact on water quality and fish habitat, including:

- installation of sediment and erosion control measures;
- avoiding the removal, alteration, or covering of substrates used for fish spawning, feeding, over-wintering or nursery areas; and
- debris control measures to manage falling debris (e.g. spalling).

Timing windows (no in-water works) in MNRF Kemptville District*:

Warmwater and cool water	→ March 15 – June 30
St. Lawrence River & Ottawa River	→ March 15 – July 15
Coldwater	→ October 1 – May 31
Big Rideau Lake & Charleston Lake	→ October 1 – June 30

* *Please note: Additional timing restrictions may apply as they relate to endangered and threatened species for works in both water and wetland areas.*

Timing windows when in-water work is restricted – based on species presence:

FISH SPECIES	TIMING WINDOW (No in-water works)

Spring:	Walleye	March 15 to May 31
	Northern Pike	March 15 to May 31
	Lake Sturgeon	May 1 to June 30
	Muskellunge	March 15 to May 31
	Largemouth/Smallmouth Bass	May 1 to July 15
	Rainbow Trout	March 15 to June 15
	Other /Unknown Spring Spawning Species	March 15 to July 15

	FISH SPECIES	**TIMING WINDOW (No in-water works)**
Fall:	Lake Trout	October 1 to May 31
	Brook Trout	October 1 to May 31
	Pacific Salmon	September 15 to May 31
	Lake Whitefish	October 15 to May 31
	Lake Herring	October 15 to May 31
	Other /Unknown Fall Spawning Species	October 1 to May 31

Additional approvals and permits may be required under the Fisheries Act. Please contact Fisheries and Oceans Canada to determine requirements and next steps. There may also be approvals required by the local Conservation Authority or Transport Canada. As the MNRF is responsible for the management of provincial fish populations, we request ongoing involvement in such discussions in order to ensure population conservation.

Species at Risk

A review of the Natural Heritage Information Centre (NHIC) and internal records indicate that there is a potential for the following threatened (THR) and/or endangered (END) species on the site or in proximity to it:

- Sensitive Species (END)
- Bank Swallow (THR)
- Barn Swallow (THR)
- Blanding's Turtle (THR)
- Bobolink (THR)
- Butternut (END)
- Eastern Meadowlark (THR)
- Eastern Small-footed Myotis (END)
- Little Brown Bat (END)
- Northern Long-eared Bat (END)
- Tri-Colored Bat (END)
- Whip poor will (THR)

All endangered and threatened species receive individual protection under section 9 of the ESA and receive general habitat protection under Section 10 of the ESA, 2007. Thus any potential works should consider disturbance to the individuals as well as their habitat (e.g. nesting sites). General habitat protection applies to all threatened and endangered species. Note some species in Kemptville District receive regulated habitat protection. The habitat of these listed species is protected from damage and destruction and certain activities may require authorization(s) under

the ESA. For more on how species at risk and their habitat is protected, please see: https://www.ontario.ca/page/how-species-risk-are-protected.

If the proposed activity is known to have an impact on any endangered or threatened species at risk (SAR), or their habitat, an authorization under the ESA may be required. It is recommended that MNRF Kemptville be contacted prior to any activities being carried out to discuss potential survey protocols to follow during the early planning stages of a project, as well as mitigation measures to avoid contravention of the ESA. Where there is potential for species at risk or their habitat on the property, an Information Gathering Form should be submitted to Kemptville MNRF at sar.kemptville@ontario.ca.

The Information Gathering Form may be found here:
http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/FormDetail?OpenForm&ACT=RDR&TAB=PROFILE&ENV=WWE&NO=018-0180E

For more information on the ESA authorization process, please see:
https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization

One or more special concern species has been documented to occur either on the site or nearby. Species listed as special concern are not protected under the ESA, 2007. However, please note that some of these species may be protected under the Fish and Wildlife Conservation Act and/or Migratory Birds Convention Act. Again, the habitat of special concern species may be significant wildlife habitat and should be assessed accordingly. Species of special concern for consideration:

- Eastern Wood-Pewee (SC)
- Snapping Turtle (SC)
- Wood Thrush (SC)

If any of these or any other species at risk are discovered throughout the course of the work, and/or should any species at risk or their habitat be potentially impacted by on site activities, MNRF should be contacted and operations be modified to avoid any negative impacts to species at risk or their habitat until further direction is provided by MNRF.

Please note that information regarding species at risk is based largely on documented occurrences and does not necessarily include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNRF's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed, and that their habitat is not damaged or destroyed through the activities carried out on the site.

The MNRF continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNRF for technical advice and to discuss what activities can occur without contravention of the Act. For specific questions regarding the Endangered Species Act (2007) or SAR, please contact MNRF Kemptville District at sar.kemptville@ontario.ca.

The approvals processes for a number of activities that have the potential to impact SAR or their habitat have recently changed. For information regarding regulatory exemptions and associated online registration of certain activities, please refer to the following website: https://www.ontario.ca/page/how-get-endangered-species-act-permit-or-authorization.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species; or
- Additional occurrences of species are discovered on or in proximity to the site.

This letter is valid until: Tue. Aug 21, 2018

The MNRF would like to request that we continue to be circulated on information with regards to this project. If you have any questions or require clarification please do not hesitate to contact me.

Sincerely,

Jane Devlin
Management Biologist
jane.devlin@ontario.ca

Encl.\
-ESA Infosheet
-NHIC/LIO Infosheet