Preliminary Environmental Impact Study for the Proposed Parking Lot Expansion at the Ottawa-Carleton Detention Centre, 2244 Innes Road, Ottawa

January 11, 2024

Version 3

Prepared for:
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Version History

Version	Date	Description of revisions
1	May 2, 2022	
2	December 22, 2022	Updated mitigations to reflect input from NCC
3	January 5, 2024	Minor update to address City of Ottawa comments and note completed tree removals

Distribution List

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3	Megan Perez (EOCH Management Inc.)	January 11, 2024	1 digital

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1.0 INTRODUCTION

This report is an updated Environmental Impact Study (EIS) prepared by Kilgour & Associates Ltd. (KAL; Appendix A) on behalf of Environmental Consulting and Occupational Health (ECOH) Management Inc. This report addresses the proposed expansion of the parking lot at the Ottawa-Carleton Detention Centre at 2244 Innes Road, Ottawa ("the Site"; Figure 1) led by Infrastructure Ontario. This report replaces the original Species at Risk Assessment Report initially submitted for the project (McKinley Environmental Solutions, 2020).

The project will interact with municipal, provincial, and federal entities and will involve review by the following agencies that have oversight:

- The City of Ottawa.
- Rideau Valley Conservation Authority (RVCA).
- The Province of Ontario through involvement of Infrastructure Ontario.
- The National Capital Commission (NCC), a federal entity. The NCC owns the lands associated with the Ottawa-Carleton Detention Centre.

This report has been prepared to primarily satisfy the environmental requirements of the NCC for the proponent's application for a Federal Land Use and Design Approval (FLUDA). This report also satisfies environmental requirements of the City of Ottawa, including those required to obtain municipal Site Plan Control Approval by incorporating information required in a Tree Conservation Report. In the case of conflict between federal and municipal planning policies, the more restrictive planning policy shall apply, as indicated by the NCC in their initial comments on the proposed project (Appendix B).

The goals of this report are to 1) identify natural heritage features on and adjacent to the Site, 2) identify potential impacts of the proposed development to those features, and 3) provide mitigation measures to minimize or eliminate those impacts. The primary foci of this report are on the potential for the project to interact with provincially and federally listed species at risk (SAR) and their habitat as well as potential impacts to wetland functions associated with a shallow depression on the Site. This preliminary EIS addresses the 66% design concept plan for the project; additional details required for the FLUDA and Site Plan Control Approval will be incorporated into a revised version of this report or other document supporting the project as they become available (e.g., revised 66% design or 99% design). This report also includes the results of a detailed tree inventory to support the eventual application for a tree cut permit from the City of Ottawa and to assist the NCC in their determination of tree compensation requirements for the project.

1.1 Property Information

The Site is approximately 7.3 hectares (ha) in size and is owned by the NCC (contact person: Marion Gale, Senior Land Use Planner). The Site is zoned as Rural Institutional (RI5) and falls within the City of Ottawa's Suburban Area. This report focuses on the northwestern corner of the Site where the proposed parking lot expansion would occur. Land cover on the Site is dominated by jail facilities associated with the Ottawa-

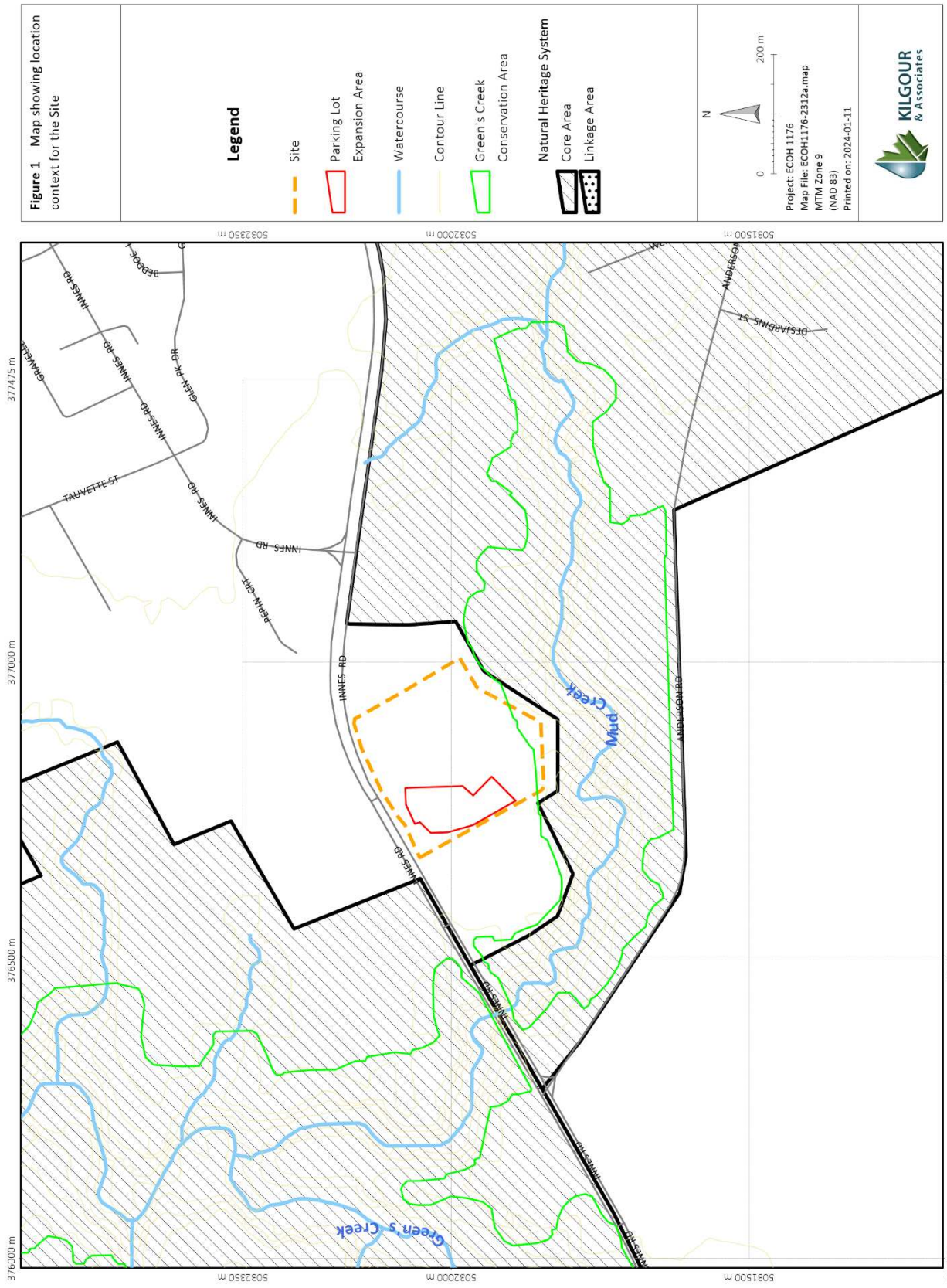


Figure 1 Map showing location context for the Site

Carleton Detention Centre and the existing parking lot. The Site itself is largely devoid of natural features but the broader area contains features such as woodlands and watercourses. Tree cover on the Site is mostly limited to scattered standalone trees on the lawn fronting Innes Road and a hedgerow along the northwestern edge of the Site. Trees on the Site flagged for removal under the previous EIS (KAL, 2022) were removed early in 2023. A small wetland exists towards the centre of the existing parking lot and is discussed in detail throughout this report from a wetland functions perspective as requested by the NCC (Appendix B).

The Site is surrounded by:

- Innes Road and rural lands to the north.
- Environmental Protection lands to the east.
- Green's Creek Conservation Area (a provincially significant Life Science Area of Natural and Scientific Interest) and Mud Creek to the south.
- Rural Institutional lands occupied by churches, followed by Green's Creek Conservation Area to the west.

2.0 ENVIRONMENTAL POLICY CONTEXT

Natural heritage policies and legislation relevant to this report are outlined below.

2.1 Federal Policies

2.1.1 *Impact Assessment Act*, 2019

The *Impact Assessment Act* (IAA) is administered by Environment and Climate Change Canada (ECCC) and outlines a process for assessing the impacts of major projects and projects carried out on federal lands. Before an NCC Federal Approval can be issued or construction can begin, the NCC must determine pursuant to the IAA that the project is not likely to cause significant adverse environmental effects.

2.1.2 Canada's Capital Greenbelt Master Plan

Canada's Capital Greenbelt Master Plan was created by the NCC and guides the preservation and use of Canada's Capital Greenbelt. Canada's Capital Greenbelt is a horseshoe-shaped green space stretching from west to east just south of Ottawa's urban core, with both extremities on the shores of the Ottawa River. The Greenbelt is divided into six main sectors, each with unique land features.

The Site is designated Non-Federal Facility & Operations in the Canada's Capital Greenbelt Master Plan (GMP). The NCC must be satisfied that the proposed project aligns with the policies, guidelines, and objectives of the GMP. Federal and Non-Federal Facilities in the GMP will be carefully managed to control their footprint and ecological impact. Existing Non-Federal Facilities are permitted; however, they are required to complement the roles of the Greenbelt and contribute positively to the Greenbelt's visual landscapes. The goal is to guide these facilities to be consistent with and complementary to the roles of

the Greenbelt. Minor expansions of Non-Federal Facilities are permitted; however, the expansion must be consistent with the policies of the GMP.

2.1.3 Federal Policy on Wetland Conservation

Federal lands are subject to the Federal Policy on Wetland Conservation with the goal of "no net loss of wetland functions". The federal wetland classification system uses the National Wetlands Working Group's (1988) definition of a wetland: "land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity which are adapted to a wet environment" (Hanson et al., 2008). The removal of wetland features on federal lands may trigger compensation requirements and project review by ECCC.

2.1.4 *Species at Risk Act*, 2002

The federal *Species at Risk Act*, 2002 (SARA) is administered by ECCC and provides direction to protect and ensure the survival of wildlife species in Canada. The purpose of SARA is to prevent populations of wildlife from becoming Extirpated, Endangered, or Threatened, provide recovery strategies for Endangered and Threatened species, and to manage other species to prevent them from becoming Endangered or Threatened.

All species listed on Schedule 1 of SARA are afforded protection on federal lands. Aquatic species and species of migratory birds protected by the *Migratory Birds Convention Act*, 1994 and listed as Endangered, Threatened, or Extirpated under Schedule 1 of SARA are protected wherever they occur in Canada, regardless of land ownership.

2.1.5 *Migratory Birds Convention Act*, 1994

The *Migratory Birds Convention Act*, 1994 (MBCA) is federal legislation administered by ECCC that provides protection for migratory birds listed under the Act. The disturbance, destruction, take, and killing of migratory birds, their eggs, and their nests are prohibited under the Act. The "incidental take" and work that would result in the destruction of active nests, or the wounding or killing of bird species protected under the MBCA and/or associated regulations (e.g., SARA) is prohibited.

2.1.6 *Fisheries Act*, 1985

The federal *Fisheries Act,* 1985 is administered by Fisheries and Oceans Canada (DFO) and provides protections to fish, fish habitat, and fisheries. Specifically, the *Fisheries Act* provides:

- Protection for all fish and fish habitat.
- Prohibition against the "harmful alteration, disruption or destruction of fish habitat (HADD)".
- Prohibition against causing "the death of fish by means other than fishing".

Projects with a scope that does not fall within DFO defined standards and codes of practice require submission of a request for review to DFO.

2.2 Provincial Policies

2.2.1 The Provincial Policy Statement, 2020

The Provincial Policy Statement (PPS) was issued under Section 3 of the *Planning Act* (1990). The current PPS came into effect on May 1, 2020. Natural features are afforded protections under Section 2.1 of the PPS. Protections may include maintenance, restoration, and improved function of diversity, connectivity, ecological function, and biodiversity of natural heritage systems. These protections restrict development and site alteration in significant natural areas (e.g., woodlands, wetlands, wildlife habitat) unless it can be demonstrated that there will be no negative effects on the features and ecological functions of those natural areas. Technical guidance for implementing the natural heritage policies of the PPS is found within the second edition of the *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005* (NHRM; Ministry of Natural Resources (MNR), 2010). This manual recommends the approach and technical criteria for protecting natural heritage features and areas in Ontario.

2.2.2 *Endangered Species Act*, 2007

The provincial *Endangered Species Act*, 2007 (ESA) is administered by the Ministry of Environment, Conservation, and Parks (MECP) and provides protection for SAR and their habitat. The Act prohibits killing, harming, harassing, possessing, transporting, buying, or selling Extirpated, Endangered, and Threatened species. Species listed as Endangered, Threatened, or Extirpated and their habitats (e.g., areas essential for breeding, rearing, feeding, hibernation, and migration) are automatically afforded legal protection under the ESA.

2.2.3 *Fish and Wildlife Conservation Act*, 1997

The provincial *Fish and Wildlife Conservation Act*, 1997 (FWCA) governs the hunting and trapping of a variety of wildlife including mammals, birds, reptiles, amphibians, and fish in Ontario, thereby facilitating the protection of wildlife and their habitat. The FWCA outlines the prohibition of hunting or trapping of specially protected species and the requirement for provincially issued licenses for the hunting or trapping of “furbearing” or “game” animals.

2.2.4 *Conservation Authorities Act*, 1990

Conservation Authorities were created to address erosion, flooding, and drought concerns regionally by managing at the watershed level. Conservation Authorities were given the ability to regulate under Section 28 of the *Conservation Authorities Act*, 1990. The Act provides mechanisms to regulate works and site alterations that have a potential to affect erosion, flooding, land conservation, and waterbodies within their jurisdiction. It is the obligation of all Conservation Authorities to implement Ontario Regulations 42/06 and 146/06 to 182/06 *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*.

2.2.5 *Invasive Species Act*, 2015

The provincial *Invasive Species Act*, 2015 regulates the prevention and management of invasive species in Ontario. As defined in the Act, an invasive species is one that is not native to Ontario and is harming, or is likely to harm, the natural environment of Ontario. Species are chosen for regulation under the Act

based on their invasive qualities and their potential impact on the environment, the economy, and societal well-being. Species regulated under the Act are listed as Prohibited or Restricted.

2.2.6 *Weed Control Act,* 1990

The intent of the *Weed Control Act* is to reduce a) the infestation of noxious weeds that negatively impact agriculture and horticulture lands, b) plant diseases by eliminating plant disease hosts, and c) health hazards to livestock and agricultural workers caused by poisonous plants. The Act states that if a species on the Schedule of Noxious Weeds occurs on a property and are negatively impacting agriculture and horticulture lands, then it must be destroyed.

2.3 Municipal Policies

2.3.1 City of Ottawa Official Plan

The City of Ottawa Official Plan (2021a) provides direction for future growth in the City and is a policy framework to guide physical development for the next 25 years.

2.3.2 City of Ottawa Tree Protection By-law (No. 2020-340)

The City of Ottawa's Tree Protection By-law respects the protection of municipal trees and municipal natural areas in the City of Ottawa and trees on private property in the Urban and Suburban Areas of the City of Ottawa. Since the Site is private property greater than 1 ha in area within the City's Suburban Area, the Tree Protection By-law applies to all trees with a diameter at breast height (DBH) of 10 centimetres (cm) or greater. Removal of such trees requires formal permission from the City of Ottawa through a tree cut permit. Distinctive trees in the Suburban Area are those with a DBH of 50 cm or greater. Given the size and location of the Site and its association with a *Planning Act* application, tree compensation for the project would normally be determined through the City's development review process. However, tree compensation requirements for this project will be determined by the NCC, which are determined on a context-sensitive basis and are guided by the principles of "no net loss" at a minimum and preferably according to the principle of "net environmental gain".

2.3.3 City of Ottawa Site Alteration By-law (No. 2018-164)

The City of Ottawa's Site Alteration By-law regulates site alteration activities such as placing or dumping fill, removing topsoil, clearing, or stripping vegetation, and altering the grade of land. The Site is subject to the City's Site Alteration By-law and therefore site alteration as defined under the By-law requires formal permission from the City.

3.0 METHODS

3.1 Agency Consultation

The Site is located within the jurisdictions of the following agencies that have environmental oversight: the NCC, DFO, the Kemptville District of the MECP, RVCA, and the City of Ottawa. At the time of writing this report, the following consultations with agencies had been undertaken:

- A request for confirmation of the potential presence of SAR related to the Site was submitted by KAL to the MECP on June 21, 2021. Their response did not indicate the potential presence of SAR beyond those considered in this report.

- The NCC provided preliminary comments on the project on February 25, 2021 (Appendix B). The project team also held a consultation meeting with the NCC on August 5, 2021 regarding the environmental scope of the project, including this EIS report and the supporting field studies.

- Representatives of the proponent attended a pre-consultation meeting with the City of Ottawa on August 17, 2021 (Appendix C). This report addresses the environmental requirements indicated by the City, including a Tree Conservation Report.

- RVCA provided preliminary comments on the project on September 28, 2021 (Appendix D). RVCA's main recommendation was related to natural hazards outside of the scope of this report. Their recommendation was to conduct geomorphological and slope stability studies to understand the risk of landslide along Mud's Creek as a result of the proposed parking lot expansion. Due to concerns related to landslide risk, RVCA advised that stormwater management plans for the project consider potential erosion and slope stability issues associated with Mud Creek, particularly if stormwater is to be discharged to the creek.

    - The NCC may choose to consult with RVCA regarding the project's potential interaction with a small, wet depression on the Site that is considered a wetland by federal definitions (details in Sections 4.3 and 4.4).

Since the project currently does not involve direct alterations to potential fish habitat areas, consultation with DFO is not necessary at this time.

3.2 Records Review

Colour digital aerial photographs from geoOttawa (City of Ottawa, 2021b) were used to initially identify natural environment features in the area through a desktop review. Additional background information in this report was obtained from a combination of studies and reports performed within the general area of the Site to review relevant information and to guide field studies. The review of existing information also included a desktop assessment of species listed under the ESA and SARA having some potential to occur in the broader area. Existing information was obtained from online sources, which include but are not limited to:

- Aquatic Species at Risk Map (DFO, 2019)
- Ontario Ministry of Natural Resources and Forestry (MNRF):
    - Natural Heritage Information Centre (MNRF, 2021a)
    - Land Information Ontario Provincially Tracked Species Grid Detail (MNRF, 2021b)
    - *Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) in Ontario* (Humphrey & Fotherby, 2019)

  - *Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario* (Humphrey, 2017)

- Species at Risk in Ontario (MECP, 2021)
- Species at Risk Public Registry (Government of Canada, 2021)
- Atlas of the Breeding Birds of Ontario 2001-2005 (Bird Studies Canada et al., 2009)
- Herp Atlas (Ontario Nature, 2019)
- iNaturalist (California Academy of Sciences and National Geographic Society, 2021)
- eBird (Cornell Lab of Ornithology, 2021)
- Bumble Bee Sightings Map (Bumble Bee Watch, 2021)
- Early Detection & Distribution Mapping System (EDDMapS Ontario, 2021)
- RVCA Regulations Mapping (RVCA, 2021)
- Official Plan Schedules (City of Ottawa, 2021a)
- *2244 Innes Road (Ottawa) – Species at Risk Survey for Parking Area Expansion* (McKinley Environmental Solutions, 2020)
- *Ecological Site Assessment for the Proposed Development at the Ottawa-Carleton Detention Centre at 2244 Innes Road* (KAL, 2017)

3.3 Field Studies

3.3.1 Vegetation

3.3.1.1 Ecological Land Classification

Vegetation communities in the proposed parking lot expansion area were identified and mapped in the field on June 23 and July 9, 2021 using standard Ecological Land Classification (ELC) methods for Ontario (Lee et al., 1998). This method provides a consistent approach to identify, describe, name, and map vegetation communities or physiographic features on the landscape based on soils and plant species composition. This method results in a standardized description of each vegetation community to determine the natural diversity and variability of communities within a site, and to provide insight into available habitat and the type of species that may be present. More specifically, the classifications from ELC provide a basis for determining whether potential habitat for a given SAR or other ecological value may be present.

Desktop reviews of available aerial imagery and preliminary field visits informed how the proposed parking lot expansion area may be divided into vegetation communities based on variation in land cover, topography, and vegetation structure. The dominant plant species were recorded within each proposed ecosite in the field to further divide ecosites into vegetation types (the finest resolution in ELC), where possible. Representative photos of each ELC unit in the proposed parking lot expansion area were taken and are included with the community descriptions in this report.

3.3.1.2 Tree Inventory

A detailed tree survey was performed on June 23, 2021, following Tree Conservation Report guidelines set forth by the City (2020). All trees with a DBH ≥ 10 cm having potential to be removed under the proposed development were identified, enumerated, mapped, their DBH measured, and their general health and condition documented. "Wildlife" trees with DBH > 25 cm were specifically looked for to assess bat habitat potential. "Wildlife" trees are standing live or dead trees with cracks, crevices, hollows, cavities, and/or loose or naturally exfoliating bark in early stages of decay (decay class 1-3; MNRF, 2015a; 2017). Butternut (*Juglans cinerea*) trees (Endangered under ESA and SARA) were also specifically looked for. Trees identified for removal in the KAL (2022) report to support the parking lot expansion were subsequently removed in early 2023.

3.3.1.3 Exotic, Invasive, and Noxious Plant Inventory

A detailed inventory for exotic, invasive, and noxious plant species within the proposed parking lot expansion area as requested by the NCC (Appendix B) was performed on August 10, 2021. Species were identified as exotic, invasive, or noxious under the Ontario *Invasive Species Act* and as listed on the Ontario Ministry of Agriculture, Food and Rural Affairs' Noxious Weed List (MAFRA, 2015) and the Ontario Invasive Plant Council's Invasive Plant List (Ontario Invasive Plant Council, 2021). Exotic, invasive, and noxious species occurrence records for the general area were reviewed from the Early Detection and Distribution Mapping System (EDDMapS Ontario, 2021). While not listed as invasive, species known to be hazardous to human health, including Poison Ivy (*Toxicodendron radicans*), Giant Hogweed (*Heracleum mantegazzianum*), Wild Parsnip (*Pastinaca sativa*), and Stinging Nettle (*Urtica dioica*) were also specifically looked for.

Species considered exotic, invasive, or noxious as described above and observed in the vicinity of the proposed parking lot expansion area were identified and photographed. Approximate distributions were mapped; localized concentrations and widespread infestations were documented. Where relevant, estimates of the number of individuals in an infestation were also made.

3.3.2 Wetland Assessment

A small depression exists near the centre of the proposed parking lot expansion area. This feature does not meet provincial definitions of a wetland based on feature size and presence of water but is considered a wetland under federal definitions (details in Sections 4.3 and 4.4). For full due diligence, the feature was classified (class, form, and type) using *The Canadian Wetland Classification System* manual prepared by the National Wetlands Working Group (1997). The wetland was characterized using the federal *Wetland Ecological Functions Assessment: An Overview of Approaches* (Hanson et al., 2008) using data collected from the present field studies and desktop background review.

3.3.3 Breeding Birds

Morning breeding bird surveys were performed using point counts following the Ontario Breeding Bird Atlas Guide for Participants (Bird Studies Canada et al., 2001). Breeding bird surveys are to be completed from survey stations that, combined, provide suitable viewing of all habitats on a site on calm weather

days with light wind (less than 3 on the Beaufort Scale[1]) and no precipitation. As per the Ontario Breeding Bird Atlas, two rounds of surveys must take place between sunrise and five hours after sunrise between May 24 and July 10, with a minimum of 15 days between survey dates.

Breeding bird surveys were conducted from two survey stations (BBS-1 and BBS-2; Figure 2) within the proposed parking lot expansion area on June 23 and July 9, 2021. All incidental observations were recorded while moving between survey points as well as during other visits to the Site. Birds were identified by song and/or direct visual observation.

Bird species were classed as regionally rare based on an analysis of data from the Atlas of Breeding Birds of Ontario (Cadman et al., 1987) based on Hill's Site Regions, now Ecoregions. The federal and provincial significance of bird species were classed based on species' listings under Schedule 1 of SARA and the ESA, and species tracked by the Natural Heritage Information Centre (MNRF, 2021a; for non-SAR species considered provincially significant).

4.0 RESULTS

4.1 Landforms, Soils, and Geology

Most of the Site is underlain by Manotick Association soils that consist of poorly drained Orthic Humic Gleysol in combination with significant areas of imperfectly drained Gleyed Sombric Brunisol (Marshall et al., 1979). These soils overlay neutral, moderately fine to fine-textured marine materials. The area is composed of sandy loam and fine sandy loam with gently sloping topography (Marshall et al., 1979).

A small portion of the east side of the Site is composed of Uplands Association that consists of excessive to well-drained Orthic Sombric Brunisol in combination with significant areas of imperfectly drained Gleyed Sombric Brunisol (Marshall et al., 1979). This area contains gently sloped and undulating slope topography with long, gently sloping depressions.

The Site is bordered by Green's Creek Conservation Area to the south and west of the Site. This area comprises narrow, continuous, and steeply sloping banks between 5% and 40% (RVCA, 2016). The relief of the slope associated with Mud Creek south of the Site is approximately 18-19 m in height. Several types of landslides have been documented along Mud Creek, such as simple rotational slides, retrogressive rotational slides, translational slides, and flows, with most landslides occurring within the past 100 years (Appendix D).

1 The Beaufort Wind Force Scale is an empirical measure that relates wind speed to observed conditions at sea or land. The scale is as follows: **0**: calm, smoke rises vertically, wind speed <1km/hr; **1**: light air, smoke drift indicates wind direction, leaves and wind vanes are stationary, wind speed = 1.1-5.5km/hr; **2**: light breeze, wind felt on exposed skin, leaves rustle, wind vanes begin to move, wind speed = 5.6-11km/hr, **3**: gentle breeze, leaves and small twigs constantly moving, light flags extended, wind speed = 12-19km/hr.

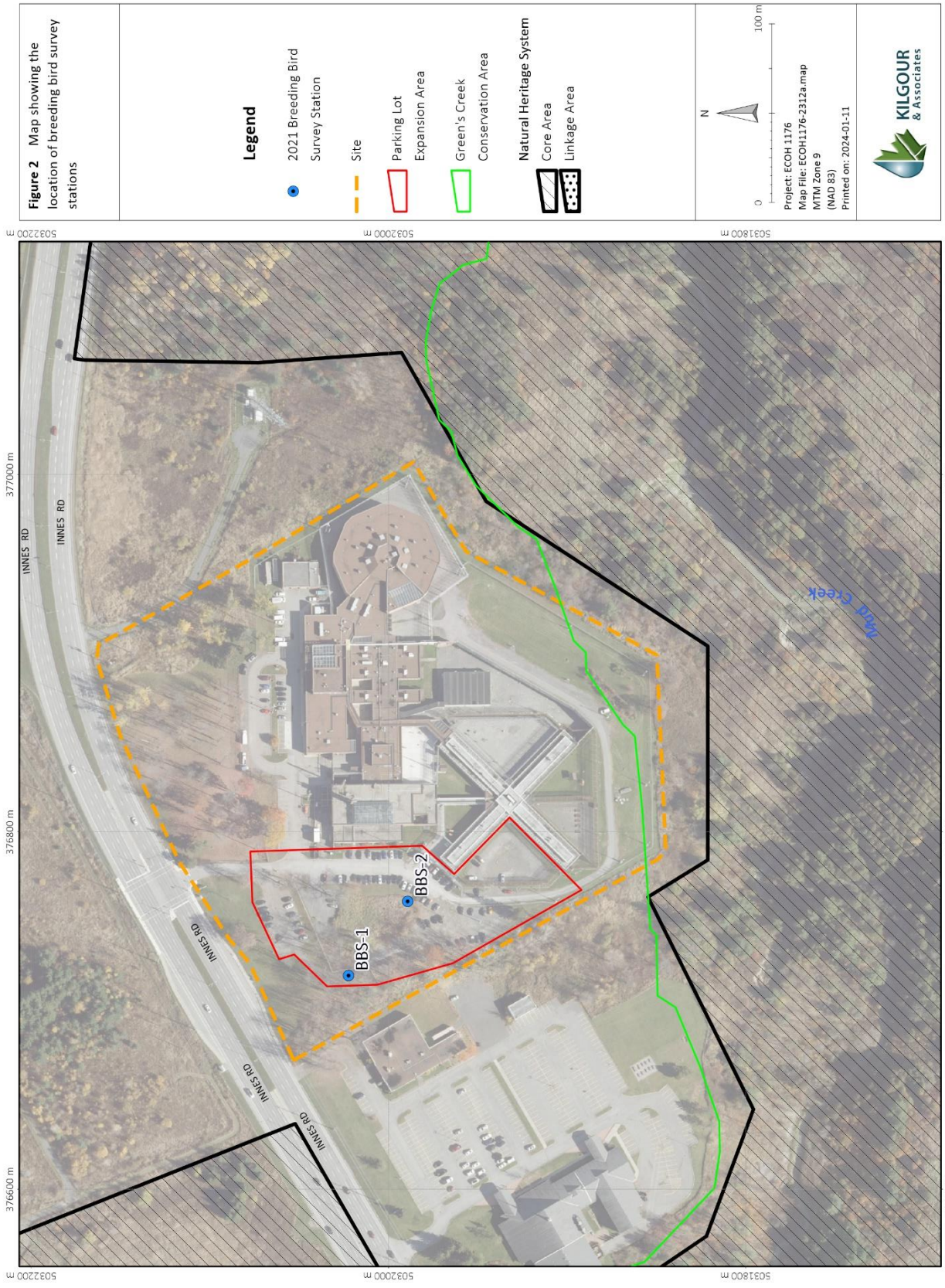


Figure 2 Map showing the location of breeding bird survey stations

4.2 Surface Water and Fish Habitat

A shallow swale exists within a hedgerow along the northwestern edge of the Site. The small wetland towards the centre of the parking lot on the Site drains into this swale, which then drains into a municipal ditch inlet (grate) at Innes Road (Figure 3). The grate discharges to Mud Creek under Innes Road and eventually into Green's Creek. The swale and the depression were both dry at the time of field studies during the late spring and summer of 2021. The small wetland is described in more detail in Sections 4.3 and 4.4. No other surface water features were observed in or directly adjacent to the parking lot expansion area.

Mud Creek is located approximately 47 metres (m) south of the southern boundary of the Site, and approximately 100 m from the parking lot expansion area (Figure 3). Mud Creek is approximately 6 kilometres (km) long and is one of five major tributaries to Green's Creek, which is located approximately 600 m northwest of the Site. Mud Creek begins at the provincially significant Mer Bleue Bog to the southeast and flows through NCC lands, crossing Renaud Road and Innes Road, before joining Green's Creek to the north of Innes Road and the Site. Riparian communities along Mud Creek are dominated by natural vegetation, including forests and meadows. A significant portion of the Mud Creek catchment comprises agricultural lands, with smaller areas of residential, commercial, and industrial land uses (RVCA, 2018).

RVCA (2018) determined that the Mud Creek system is dominated by clay and silt substrates, with moderate amounts of gravel and sand, with diverse morphological conditions, including runs, riffles, and pools. In-stream aquatic vegetation tends to be relatively limited, due in part to the clay substrates; however, narrow-leaved emergent and submerged vegetation are widespread. Mud Creek is classified as a warmwater fishery, with cool-warm reaches; dissolved oxygen, conductivity and pH are sufficient to support warmwater aquatic life (RVCA, 2018). A total of 16 fish species were identified in RVCA's 2018 assessment, representing cool to warmwater species (RVCA, 2018). Game fish included Largemouth Bass (*Micropterus salmoides*) and Pumpkinseed (*Lepomis gibbosus;* RVCA, 2018). No SAR fish were identified in the 2018 assessment (RVCA, 2018).

4.3 Vegetation

4.3.1 Ecological Land Classification

Four distinct ELC units (ecosites, vegetation types, or other) were delineated within the proposed parking lot expansion area (Figure 3). Two of the four ELC units are of anthropogenic nature (i.e., open lawn and parking areas) consistent with the lack of natural features in the existing parking lot. The other two ELC units consist of a deciduous hedgerow and a small wetland.

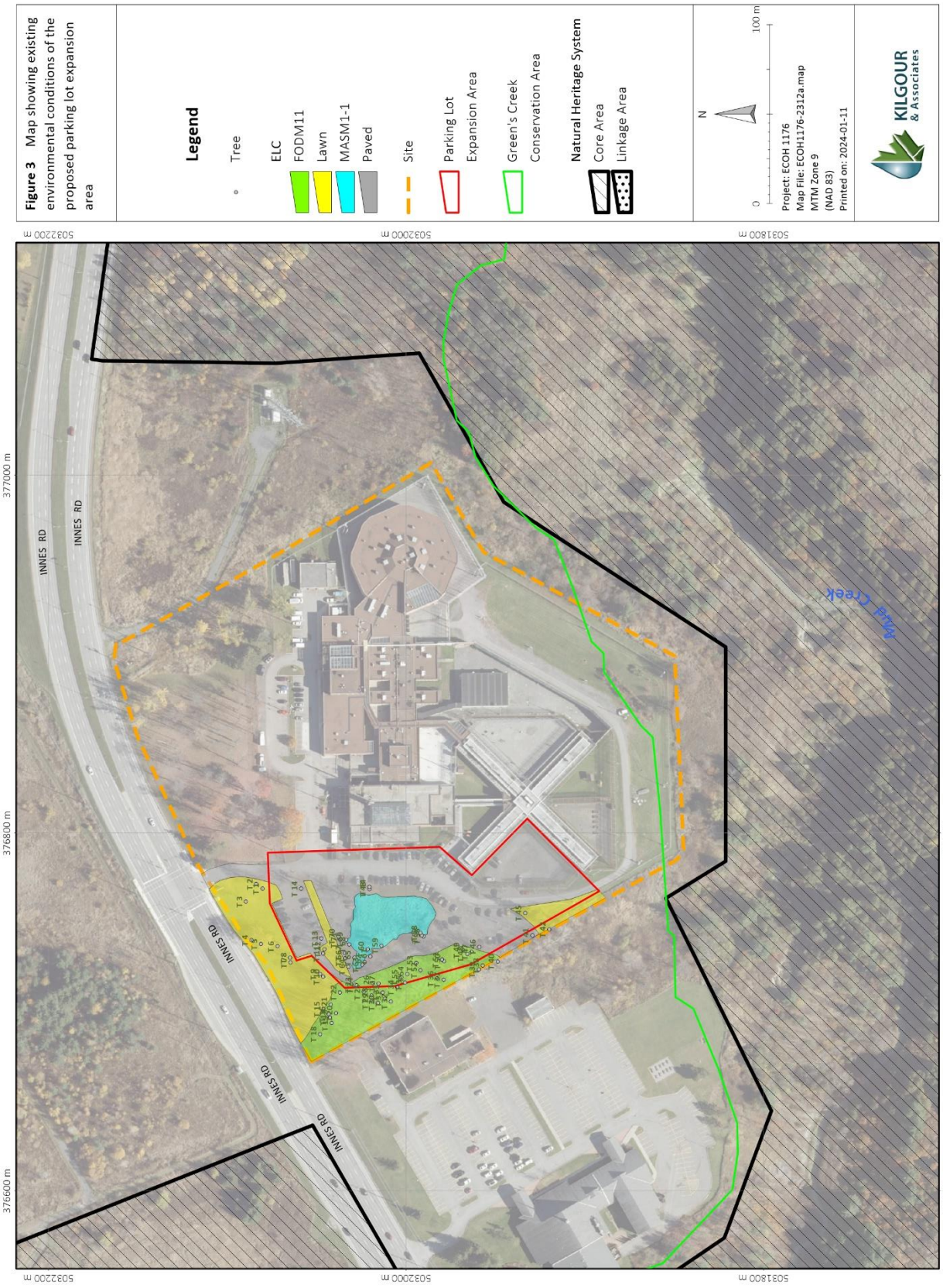


Figure 3 Map showing existing environmental conditions of the proposed parking lot expansion area

Existing Parking Lot (no ELC code)

The proposed parking lot expansion area is dominated by packed gravel and paved surfaces associated with the existing parking lot and the entrance to the Ottawa-Carleton Detention Centre (Figure 4).

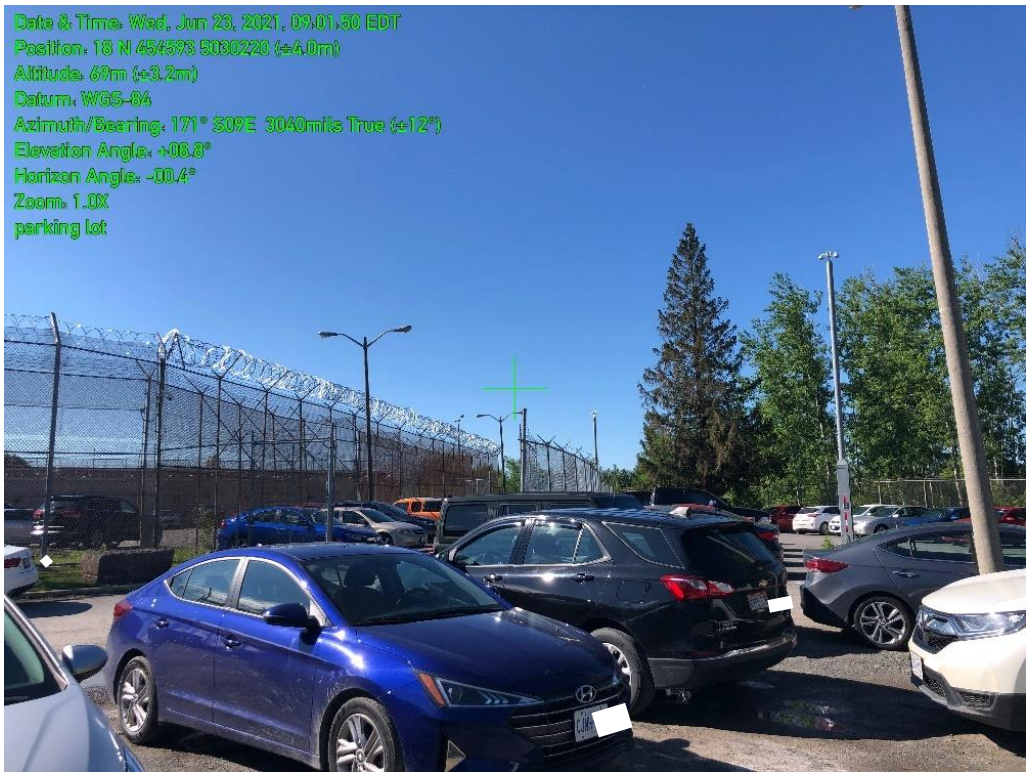


Figure 4 Photo of the existing parking lot on the Site (taken June 23, 2021)

Open Lawn (no ELC code)

The northwestern portion of the Site fronting Innes Road is dominated by open lawn (Figure 5). This area contained scattered cover of mature, standalone trees such as Silver Maple (*Acer saccharinum*) and Basswood (*Tilia americana*).

Figure 5 Photo of the open lawn area north of the existing parking lot on the Site (taken July 9, 2021)

Naturalized Deciduous Hedgerow Ecosite (FODM11)

A naturalized deciduous hedgerow exists along the northwestern edge of the Site (Figure 6). This hedgerow is dominated by Silver Maple and includes Basswood and Trembling Aspen (*Populus tremuloides*). The subcanopy consists primarily of Common Buckthorn (*Rhamnus cathartica*) and the shrub layer is covered with Wild Grape (*Vitis riparia*). Ground cover includes Sensitive Fern (*Onoclea sensibilis*), Canada Goldenrod (*Solidago canadensis*), and Reed Canary Grass (*Phalaris arundinacea*). Soils here are characterized by sandy loam. As mentioned in Section 4.2, this hedgerow contains a shallow swale which receives flows from the small wetland towards the centre of the existing parking lot, and then drains into a grate at Innes Road into Mud Creek, followed by Green's Creek.

Figure 6 Photo of the Naturalized Deciduous Hedgerow along the northwestern edge of the Site (taken June 23, 2021)

Cattail Mineral Shallow Marsh Type (MASM1-1)

Towards the centre of the existing parking lot is a wet depression approximately 0.1 ha in size that is dominated by emergent wetland vegetation. The northern portion of this features consists of a dense stand of Common Reed (*Phragmites australis*; an invasive species) while the southern portion is dominated by Common Cattail (*Typha latifolia*; Figure 7). The fringes of this feature are highly disturbed given its location within the existing parking lot. Some edges of the depression contain weeds and invasive species such as Perennial Sow-thistle (*Sonchus arvensis*), Common Buckthorn, and Purple Loosestrife (*Lythrum salicaria*), while other edges consist of mowed lawn and gravel.

Figure 7 Photo of the Cattail Mineral Shallow Marsh Type towards the centre of the existing parking lot on the Site (taken June 23, 2021)

The feature has soils reflective of poor drainage, with approximately 40 cm of organic soils underlain by sand and clay with signs of gley, an indication of prolonged water saturation. The soil surface was dry in the late spring and early summer, suggesting that the water table is rarely or only briefly above the substrate surface in the spring, but with soil water remaining in the rooting zone for most of the growing season. According to Ottawa-Carleton Detention Centre staff, this feature is a result of a pond that was originally dug in the 1970s, which is visible in geoOttawa imagery from 1976 through the early 2000s. Water was held in the pond via a dike (Figure 8) that was eventually released to allow water to drain from the pond, resulting in current shallow marsh conditions. The feature is currently used as a snow management area which would contribute to higher water levels during the spring freshet. Gravel and stumps were observed throughout the feature, likely a result of being pushed in from snow plows.

Figure 8 Photo showing the remnants of a dike in the northwestern portion of the wetland on Site (taken June 23, 2021)

While this small depression has wetland plant species cover comprising >50% of total plant cover, it does not meet the size requirements (≥0.5 ha) of the Ontario Wetland Evaluation System (OWES) to be considered a "true" wetland (MNRF, 2014). Further, this area does not have standing water or pools comprising >20% ground coverage, per the ELC wetland definition (Lee et al., 1998). Therefore, this feature does not meet provincial definitions of wetland. However, federal lands are subject to the Federal Policy on Wetland Conservation, and the federal wetland classification system uses the National Wetlands Working Group's (1988) definition of a wetland: "land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity which are adapted to a wet environment" (Hanson et al., 2008). This definition does not specify size criteria for wetlands as in OWES and ELC, and therefore the subject wet depression is considered a wetland from a federal perspective simply due to the presence of hydrophytic vegetation and poorly drained soils. Given the federal ownership of the Site and involvement of the NCC on the project, the federal definition of a wetland will be used in this report.

4.3.2 Tree Survey

Details from the tree inventory are presented in Appendix E. In general, the parking lot expansion area contains 71 trees with DBH ≥10 cm from 11 species (Figure 3), with over 70% of trees observed dominated by two species: Silver Maple and Basswood (Table 1). Fifty-six trees were assessed as "wildlife" trees (Appendix E).

Table 1 Tree species count and percent composition for the proposed parking lot expansion area prior to completion of tree removals

Common Name	Taxonomic Name	Count	Percent Composition (%)
American Elm	*Ulmus americana*	1	1.4
Basswood	*Tilia americana*	17	23.9
Green Ash	*Fraxinus americana*	1	1.4
Honey Locust	*Gleditsia triacanthos*	1	1.4
Red Maple	*Acer rubrum*	1	1.4
Silver Maple	*Acer saccharinum*	34	47.9
Sugar Maple	*Acer saccharum*	5	7.0
Trembling Aspen	*Populus tremuloides*	8	11.3
Weeping Willow	*Salix babylonica*	1	1.4
White Oak	*Quercus alba*	1	1.4
White Spruce	*Picea glauca*	1	1.4
TOTAL		**71**	**100**

4.3.2.1 Ecological Significance of Trees

The Site does not contain any federally or provincially significant tree species (i.e., those listed under the ESA or SARA, or those tracked by the Natural Heritage Information Centre (MNRF, 2021a)). The Site contains a single White Oak (*Quercus alba*) and a single Honey Locust (*Gleditsia triacanthos*) which are considered regionally significant and rare, respectively, in the Ottawa area (Muncaster Environmental Planning Inc. and Brunton Consulting Services, 2005). The Site contains 13 distinctive trees (≥50 cm DBH per the City of Ottawa (2020); Appendix E).

Compared to forest cover in the vicinity and the Site's location within the Greenbelt, the limited tree cover on the Site likely contributes limited ecological services. Trees in the proposed parking lot expansion area likely contribute to shading and reduction of urban heat island effects and filtration of dust, noise, and light pollution associated with the jail facility and Innes Road. Trees on the Site likely provide habitat for common bird and small mammal species in the Ottawa area. They are unlikely to provide unique, rare, or specialized habitat, or habitat for SAR, especially given that much more optimal habitat for a variety of wildlife species exists south and west of the Site in Green's Creek Conservation Area. Tree cover on the Site does not appear to provide a greenspace linkage/corridor to Green's Creek Conservation Area.

4.3.3 Exotic, Invasive, and Noxious Plant Inventory

The proposed parking lot expansion area contained six plant species considered exotic, invasive, or noxious (Figure 9, Table 2).

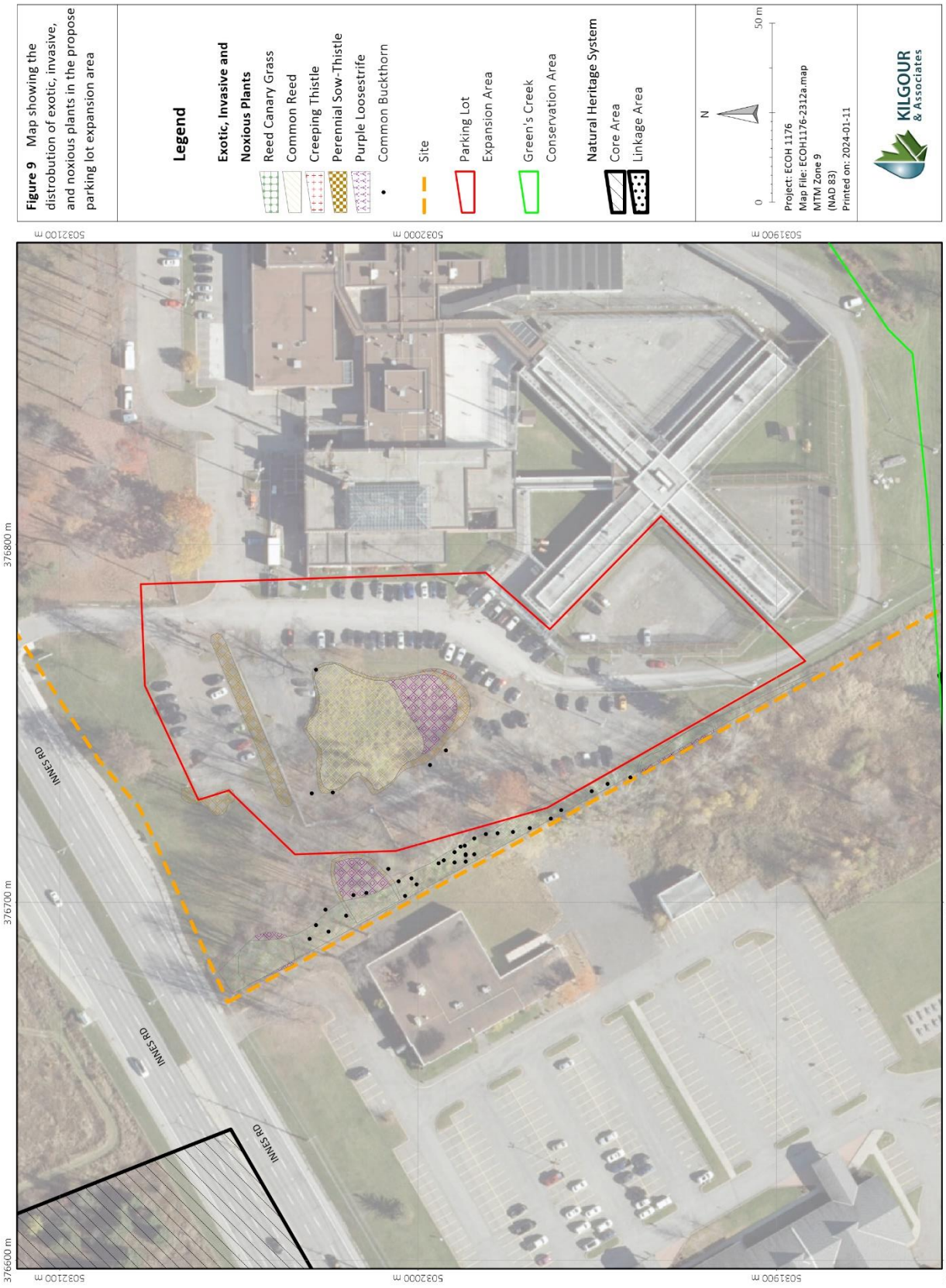


Figure 9 Map showing the distrobution of exotic, invasive, and noxious plants in the propose parking lot expansion area

Table 2 Exotic, invasive, and noxious plants observed in the proposed parking lot expansion area

Common Name	Taxonomic Name	*Invasive Species Act*	*Weed Control Act*	Ontario Invasive Plant Council	EDDMapS Ontario
Common Reed	*Phragmites australis*	X Restricted		X	X
Creeping Thistle	*Cirsium arvense*		X		X
Perennial Sow-thistle	*Sonchus arvensis*		X		
Common Buckthorn	*Rhamnus cathartica*		X	X	X
Purple Loosestrife	*Lythrum salicaria*			X	X
Reed Canary Grass	*Phalaris arundinacea* spp. *arundinacea*			X	X

Species listed under the *Invasive Species Act* and the *Weed Control Act* have associated regulatory requirements, while species listed by the Ontario Invasive Plant Council or tracked by EDDMapS Ontario do not have any associated requirements.

Common Reed is a Restricted species under the *Invasive Species Act* and is the only species regulated under the Act that was observed in the proposed parking lot expansion area. Under that Act, it is illegal to import, deposit, release, breed/grow, buy, sell, lease, or trade a Restricted species. Common Reed is also identified as an invasive species by the Ontario Invasive Plant Council and is tracked under EDDMapS Ontario. Common Reed dominated approximately half of the wetland in the parking lot area, forming a dense monoculture stand in the north part of the wetland (Figure 10).

Figure 10 Photo of the dense stand of Common Reed in the wetland on Site (taken August 10, 2021; note that the foreground contains Common Cattail)

Common Buckthorn, Creeping Thistle (*Cirsium arvense*), and Perennial Sow-thistle are listed as noxious weeds under the Ontario *Weed Control Act*. Common Buckthorn is also identified as an invasive species by the Ontario Invasive Plant Council and is tracked under EDDMapS Ontario. Creeping Thistle is also tracked under EDDMapS Ontario. Under the *Weed Control Act*, landowners have a legal obligation to manage weed species on their properties; specifically, landowners are required to destroy weeds listed as noxious.

Five Common Buckthorn individuals were observed around the perimeter of the wetland and is widespread in the deciduous hedgerow along the northwestern edge of the Site (Figure 11). Within this hedgerow, Common Buckthorn formed the dominant species in the shrub layer.

Figure 11 Photo of Common Buckthorn in the deciduous hedgerow along the northwestern edge of the Site, where it represented the dominant species in the shrub layer (photo taken August 10, 2021)

Observations of Creeping Thistle in the proposed parking lot expansion area were restricted to six individuals, three of which were noted near the south edge of the wetland and three situated on the perimeter of the deciduous hedgerow. The individuals were short and not flowering at the time of the survey and appeared to be controlled by mowing, particularly between the hedgerow and the fence line (Figure 12).

Figure 12 Photo of Creeping Thistle at the edge of the deciduous hedgerow along the northwestern edge of the Site (taken August 10, 2021)

Perennial Sow-thistle was abundant and widespread throughout the proposed parking lot expansion area. It occurred along disturbed paved areas, including the perimeter of the existing parking area, and was one of the dominant species around the perimeter of the wetland. It was also widespread along the edges of the deciduous hedgerow, with increased abundances where the canopy was relatively more open (Figure 13).

Figure 13 Photo of Perennial Sow-thistle at the perimeter of the wetland on the Site (taken August 10, 2021)

Purple Loosestrife (*Lythrum salicaria*) is listed on the Ontario Invasive Plant Council's weed list; this listing is not accompanied by regulatory requirements. Purple Loosestrife occurred in relatively low abundances in both the wetland and the hedgerow. In general, it grew as scattered individuals in the south half of the wetland, especially around the perimeter, where it was interspersed with other vegetation (Figure 14). Within the hedgerow, it tended to occur as scattered individuals along the edge. A relatively larger concentration occurred at the north end of the hedgerow, near Innes Road (Figure 15).

Figure 14 Photo of Purple Loosestrife individuals along the south edge of the wetland (taken August 10, 2021)

Figure 15 Photo of Purple Loosestrife at the north end of the deciduous hedgerow at Innes Road (taken August 10, 2021)

Reed Canary Grass (*Phalaris arundinacea* ssp. *arundinacea*) is an invasive species per the Ontario Invasive Plant Council and its occurrences are tracked on EDDMapS Ontario; this listing is not accompanied by regulatory requirements. Differentiation between native Reed Canary Grass (*P. arundinacea*) and the invasive subspecies (*P. arundinacea* ssp. *arundinacea*) is challenging in the absence of genetic analysis (Anderson, 2012). Habitat occurrences can give some qualitative indications of which subspecies may be detected, with the invasive subspecies more frequently detected in ditches and marshes, while the native subspecies typically occurs in shallow waters along the shorelines of lakes and rivers.

On-Site, Reed Canary Grass had scattered occurrences throughout the deciduous hedgerow, where it was interspersed with native groundcover species including Sensitive Fern and Canada Goldenrod. While it could not be conclusively determined, the presence of Reed Canary Grass in this somewhat disturbed, moist hedgerow suggests that this is the invasive subspecies.

4.4 Wetland Assessment

The classification of the on-Site wetland (class, form, subform, and type) based on *The Canadian Wetland Classification System* (National Wetlands Working Group, 1997) is presented in Table 3. Wetlands at the class level are recognized based on properties of the wetland that reflect the overall origin of the wetland ecosystem and the nature of the wetland environment. Wetland forms are subdivisions of each wetland class based on surface morphology, surface pattern, water type, and morphology characteristics of underlying mineral soil. Some forms can be further subdivided into subforms. Wetland types are subdivisions of the wetland forms and subforms based on physiognomic characteristics of the vegetation communities (National Wetlands Working Group, 1997).

Table 3 Federal classification of the on-Site wetland

Wetland Class	Wetland Form	Wetland Subform	Wetland Type
Marsh: Periodic or persistent standing water or slow-moving surface water which is circumneutral to alkaline and generally nutrient-rich. Vegetation is dominated by graminoids, shrubs, forbs, or emergent plants	**Basin marsh**: Not situated along the shores of deep and large lakes; confined to topographically defined basins and shallow depressions that collect surface runoff and receive groundwater seepage; water fresh and saline.	**Isolated basin marsh**: Situated in closed shallow depressions that collect surface runoff and drain via seepage outflow.	**Graminoid**: Dominated by undifferentiated grass-like plants.

Wetland functions were qualitatively characterized using Appendix A of the federal *Wetland Ecological Functions Assessment: An Overview of Approaches* (Hanson et al., 2008) based on data collected from field studies and desktop background reviews (Appendix F). In this assessment tool, a series of "yes" or "no" questions are provided regarding seven categories of wetland functions: special features, vegetation diversity, wildlife and fish habitat, flood and stormwater storage/attenuation, water quality protection, shoreline protection, and groundwater recharge/discharge. Positive answers to questions indicate the presence of factors important for the given wetland function category.

The wetland does not appear to provide important functions related to special features, vegetation diversity, wildlife and fish habitat, shoreline protection, or groundwater recharge/discharge. The wetland lacks special features because it is not directly associated with an environmentally sensitive area or natural feature corridor, nor is it known to provide habitat for federally, provincially, or regionally significant species. In terms of vegetation diversity, the wetland is dominated by one vegetation community and one dominant form (robust emergent). The vegetation community is dominated by two species, one of which is invasive (Common Reed). It also includes exotic and noxious vegetation species. Due to the wetland's lack of native vegetation diversity and open water along with its location within a parking lot, it also does not provide important habitat for fish or other wildlife. Throughout the field visits, only one wildlife species was observed utilizing the wetland (Red-winged Blackbird (*Agelaius phoeniceus*); this species was exhibiting nesting behaviour). The wetland habitat provided for this species is not unique or scarce to the region. The wetland also does not provide functions relating to shoreline protection because it is not located within a lake fringe or riverine or coastal setting. No signs of groundwater discharge (e.g., marl soil or vegetative indicators) or recharge were observed in the wetland, and the wetland is unlikely to contribute to the maintenance of base flow of other watercourses.

The wetland may artificially provide functions related to flood and stormwater storage since it is used as a snow management area. Considering the size of the wetland (0.1 ha) relative to the estimated size of its catchment (0.7 ha), the wetland is likely to reach its water storage capacity due to melt associated with accumulated snow. The wetland may therefore be important for holding and storing water associated with spring snowmelt. It likely receives stormwater from the adjacent parking lot. The wetland has sufficient vegetative density to decrease water energy and allow settling of suspended materials associated with snowmelt and stormwater, and thus likely provides some water quality protection functions for downstream watercourses, including Mud Creek.

4.5 Breeding Birds

Weather conditions during the two rounds of breeding bird surveys are provided in Table 4. A total of 15 bird species were observed (Table 5). No federally, provincially, or regionally significant bird species were observed. Red-winged Blackbird was the most observed species, followed by American Goldfinch (*Spinus tristis*), American Robin (*Turdus migratorius*), Cedar Waxwing (*Bombycilla cedrorum*), Northern Cardinal (*Cardinalis cardinalis*), and Song Sparrow (*Melospiza melodia*). Red-winged Blackbird observations were mostly associated with the wetland on the Site, whereas observations of the other commonly observed bird species were mostly associated with the hedgerow along the northwestern edge of the Site. Note that loud background noise due to traffic on Innes Road was a limitation of the breeding bird surveys.

Table 4 Summary of weather conditions during breeding bird surveys

Date	Wind (Beaufort Scale)	Air Temperature (°C)	Cloud Cover (%)	Precipitation
2021-06-23	1	11 to 12	0-25	None
2021-07-09	2	14	100	None

Table 5 Summary of bird observations

Common Name	Scientific Name	Station(s) Observed	Date(s) Observed	Highest Breeding Evidence[1]
American Crow	*Corvus brachyrhynchos*	BBS-1, BBS-2	2021-07-09	Observed
American Goldfinch	*Spinus tristis*	BBS-1, BBS-2	2021-06-23, 2021-07-09	Probable
American Robin	*Turdus migratorius*	BBS-1, BBS-2	2021-06-23, 2021-07-09	Possible
Black-capped Chickadee	*Poecile atricapillus*	BBS-2	2021-07-09	Possible
Cedar Waxwing	*Bombycilla cedrorum*	BBS-1, BBS-2	2021-06-23, 2021-07-09	Probable
Chipping Sparrow	*Spizella passerina*	BBS-2	2021-06-23	Possible
Common Grackle	*Quiscalus quiscula*	BBS-1	2021-07-09	Possible
Common Yellowthroat	*Geothlypis trichas*	BBS-2	2021-06-23	Possible
Gray Catbird	*Dumetella carolinensis*	BBS-2	2021-06-23	Possible
Mourning Dove	*Zenaida macroura*	BBS-2	2021-07-09	Possible
Northern Cardinal	*Cardinalis*	BBS-1, BBS-2	2021-06-23, 2021-07-09	Possible
Northern Flicker	*Colaptes auratus*	BBS-1	2021-07-09	Observed
Red-winged Blackbird	*Agelaius phoeniceus*	BBS-1, BBS-2	2021-06-23, 2021-07-09	Confirmed
Ring-billed Gull	*Larus delawarensis*	BBS-1, BBS-2	2021-07-09	Possible
Song Sparrow	*Melospiza melodia*	BBS-1, BBS-2	2021-06-23, 2021-07-09	Observed

[1]Breeding evidence is based on the following:

- **Observed** = species observed in its breeding season (no breeding evidence).
- **Possible** = species observed in its breeding season in suitable breeding habitat; singing male(s) present or breeding calls heard in suitable nesting habitat in breeding season.

- **Probable** = at least seven individuals singing or producing other sounds associated with breeding (e.g., calls or drumming), all heard during the same visit and in suitable nesting habitat during the species' breeding season; pair observed in suitable nesting habitat in nesting season; permanent territory presumed through registration of territorial song or the occurrence of an adult bird at the same place in breeding habitat on at least two days a week or more apart during the breeding season; courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation; visiting probable nest site; agitated behaviour or anxiety calls of an adult; brood patch on adult female or cloacal protuberance on adult male.
- **Confirmed** = nest-building or excavation of nest hole by a species other than a wren or a woodpecker; distraction display or injury feigning; used nest or eggshells found (occupied or laid within the period of the survey); recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight; adult leaving or entering nest sites in circumstances indicating an occupied nest; adult carrying fecal sac; adult carrying food for young; nest containing eggs; nest with young seen or heard.

4.6 Incidental Wildlife Observations

In addition to the species noted above, Eastern Cottontail (*Sylvilagus floridanus*) and Raccoon (*Procyon lotor*) were incidentally observed while on-Site.

4.7 Species at Risk

An assessment of species listed under SARA and ESA was completed to identify species having some potential to occur on or near the proposed parking lot expansion area, including Extirpated, Endangered, Threatened, and Special Concern species. The SAR assessment evaluated whether the proposed parking lot expansion area would or could provide suitable habitat for SAR and whether they have potential to interact with the project. An assessment of the potential for SAR and their potential habitat was completed based on the results of the field visit, ELC, and a desktop review that considered known species ranges, historic observation records, and preferred habitat requirements of these species (Appendix G). A total of 35 SAR were identified with some potential (i.e., low or moderate potential) to occur in the broader vicinity of the Site. Six SAR had a moderate potential to occur on the Site and/or interact with the project (Table 6). Those with a moderate potential are known to occur within 10 km of the Site, and suitable habitat for the species exists within the proposed parking lot expansion area. No SAR were assessed as having a high potential to occur on the Site and/or interact with the project. SAR with a high potential are those that are known to occur on or adjacent to the Site (i.e., were observed by KAL or others during field surveys), with suitable habitat for the species in the proposed parking lot expansion area. All other SAR with potential to occur in the region based on their documented ranges were assessed as having a low, negligible, or no potential to occur within the proposed parking lot expansion area due to lack of occurrences records and/or suitable habitat (Appendix G).

Potential interactions with and impacts to the SAR presented in Table 6 are discussed in Section 6.4.

Table 6 Species at risk with moderate potential to interact with the project

Common Name	Taxonomic Name	Status under *Endangered Species Act*	Status under *Species at Risk Act* (Schedule 1)	Potential to Interact with the Project
Birds				
Barn Swallow	*Hirundo rustica*	Threatened	Threatened	Moderate
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Special Concern	Threatened	Moderate
Mammals				
Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered	Moderate
Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered	Moderate
Tri-coloured Bat	*Perimyotis subflavus*	Endangered	Endangered	Moderate
Vascular Plants				
Butternut	*Juglans cinerea*	Endangered	Endangered	Moderate

SAR presented in Table 6 that are listed as Special Concern under the ESA (i.e., Red-headed Woodpecker) do not receive individual or habitat protection under the ESA, whereas Threatened and Endangered species do. However, individuals of these species are protected under other regulations addressing wildlife conservation generally, such as the FWCA, the MBCA, and the PPS. In addition, species listed as Special Concern under the ESA may receive habitat protection by the municipality if they are observed in habitats that meet the criteria for designation as Significant Wildlife Habitat for Special Concern Species (MNRF, 2015a). In the case of Red-headed Woodpecker, it is listed as Threatened under SARA and is therefore afforded protections under that Act regardless of the designation of Significant Wildlife Habitat.

4.8 Other Significant Natural Heritage Features

The Site does not contain Significant Woodlands, Significant Valleylands, Earth/Life Science Areas of Natural and Scientific Interest, or potentially significant wildlife corridors or greenspace linkages.

The proposed parking lot expansion area is situated approximately 40 m from the northern edge of Green's Creek Conservation Area, a provincially significant Life Science Area of Natural and Scientific Interest. Green's Creek Conservation Area extends along the south and west boundaries of the Site and provides a link between the provincially significant Mer Bleue Bog and the Ottawa River. It comprises steep-sided ravines and plateaus along its length and supports diverse vegetation communities, which in turn provide habitat for SAR (RVCA, 2016). Green's Creek is also part of the City of Ottawa's Natural Heritage System (City of Ottawa, 2003).

Guidelines and criteria for the identification of Significant Wildlife Habitats in Ecoregion 6E are provided by MNRF (2015a). Significant Wildlife Habitats are identified based on the presence of certain habitat types (identified through ELC codes) and the presence and/or groupings of certain species. The hedgerow along the northwestern edge of the Site has potential to support Red-headed Woodpecker, which is listed as Special Concern under the ESA. If this species were to occur in suitable habitat areas on the Site, these areas may meet the criteria for Significant Wildlife Habitat for Special Concern Species. However, given the involvement of a federal entity on the project and Red-headed Woodpecker's Threatened status under SARA, the more restrictive habitat designations and protections under SARA would apply. No other potential Significant Wildlife Habitats are expected to occur on the Site.

The southern portion of the broader parcel upon which the OCDC facility is located extends into a Natural Heritage System Core Area as designated under the City's Natural Heritage System Overlay. It is recognized that, within Natural Heritage System Core Areas, development and/or site alteration are required to maintain or enhance the integrity, biodiversity and ecosystem services of the area. Moreover, development and/or site alteration must not compromise the potential for long-term enhancement and restoration of the ecological integrity, biodiversity and ecosystem services of the area. Regardless, neither the OCDC facility itself (i.e. the Site) nor the specific work area within the Site are located within the Natural Heritage System Core Area (Figure 1).

5.0 DESCRIPTION OF THE PROPOSED PROJECT

The proposed project involves the expansion of the existing parking lot area at the Ottawa-Carleton Detention Centre to include a total of 256 parking spaces (an addition of 32 parking spaces; Figure 16). The intent of the 66% design concept plan is to formalize existing ad-hoc parking in gravel areas. The existing gravel parking area will be reconstructed as asphalt. Current asphalt areas will be resurfaced. The paved parking area east of the entry gate and in front of the main building of the Ottawa-Carleton Detention Centre is not included in the design scope.

The wetland on the Site would be preserved and the project would respect a 5 m setback from this feature. The 5 m buffer around the wetland would be planted with native vegetation species (e.g., trees, shrubs, and perennials) appropriate for the region. The proposed parking lot expansion would likely require the removal of 17 trees. The hedgerow along the northwestern edge of the Site and trees associated with the wetland would be retained.

Stormwater and snow would be managed on-Site in consultation with the NCC and RVCA. Post-development stormwater flow paths will match existing conditions, with existing grades generally being maintained and stormwater continuing to be directed towards the wetland. Stormwater management infrastructure would be improved through a new underground exfiltration storage facility and oil and grit separator downstream of the wetland, upstream of the grate inlet to Mud Creek at Innes Road. The culvert at the downstream end of the wetland will be replaced. The wetland will no longer be used for snow management.

Detailed lighting plans are not yet available for the project, but will be designed to provide sufficient lighting to all parking spaces. Existing lighting/camera poles will be reused where possible. The NCC requires outdoor lighting to be compliant with "dark sky" and "bird-safe" principles. According to the NCC's Bird-Safe Design Guidelines, all outdoor lights should have a colour temperature of no more than 3,000 Kelvin and full cut-off fixtures should be used to limit light spill. The NCC's Bird Safe Design Guidelines will be consulted in the development of lighting plans, but unique constraints associated with the Ottawa-Carleton Detention Centre may prevent alignment with these guidelines. The facility has specific lighting requirements for safety and security purposes (e.g., areas captured by security cameras have to be illuminated at night). Options to reduce or completely eliminate light spill into the wetland will be explored.

The timeline for the project is currently unknown and depends on the approvals process.

6.0 IMPACT ASSESSMENT

6.1 Surface Water and Fish Habitat

The project is not expected to directly interact with surface water features or potential fish habitat areas. Stormwater and snow would be managed following requirements of the NCC and RVCA and as such can be anticipated to have no net deleterious effect on water quality or fish habitat. The wetland will no longer be used as a snow management area. Stormwater would drain towards the wetland, which will continue to discharge to Mud Creek and eventually Green's Creek. The new underground exfiltration storage facility and oil and grit separator downstream of the of the wetland is intended to reduce the quantity and improve the quality of stormwater that eventually discharges to Green's Creek.

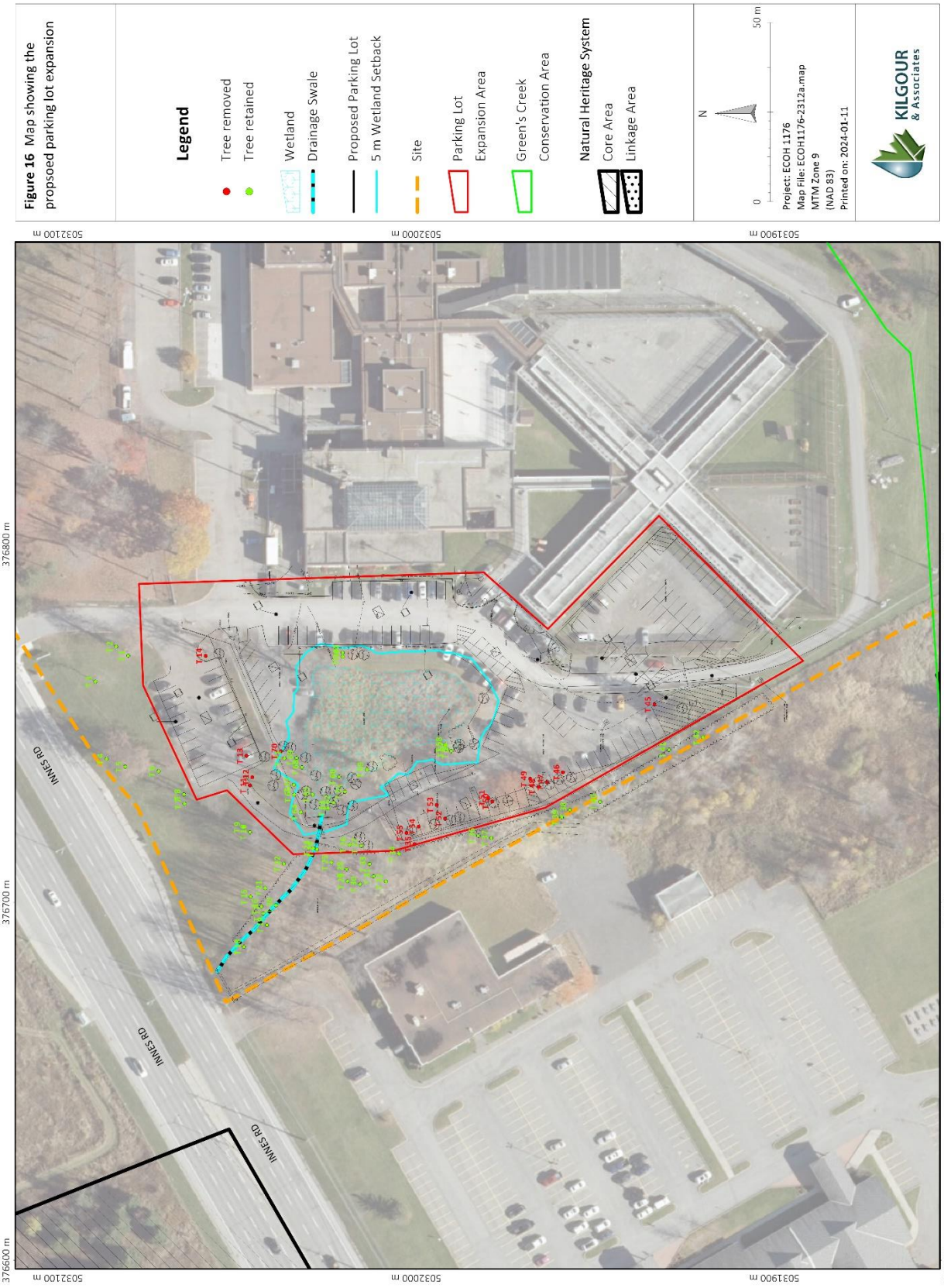


Figure 16 Map showing the propsoed parking lot expansion

The potential for sediment to be released into surface water features during site preparation and construction would be mitigated using standard erosion and sediment control measures.

Per RVCA's recommendations for the project (Appendix D), a geotechnical expert has been retained by the proponent to determine if the project would contribute to landslide and/or erosion risk associated with the slope along Mud Creek. If it is determined that the project would contribute to such risks, potential environmental impacts to Mud Creek associated with slope erosion and landslides would also be anticipated if no mitigation measures are implemented. Such impacts to Mud Creek could include changes to the creek's morphology, aquatic and riparian habitat, and water quality.

6.2 Vegetation

Given the existing anthropogenic nature of the parking lot expansion area and the project's avoidance of the wetland, the project requires minimal vegetation removal. The design concept plan addressed in this report required the removal of 17 trees (Appendix E, Figure 16; removals have been completed. Removed trees will be compensated for following NCC requirements, and as such no net negative impacts to vegetation and related ecosystem services are anticipated. Removals and compensation plantings were coordinated with NCC to determine feasible tree compensation requirements, as the Site has unique planting constraints, such as the need to maintain certain sight lines for security purposes. The approved landscape plant to address the (re)planting of trees (Appendix I) is anticipated to be implemented in mid-2024.

The project is expected to interact with plant species considered exotic, invasive, or noxious, including Creeping Thistle, Perennial Sow-thistle, Common Buckthorn, Purple Loosestrife, and Reed Canary Grass. Site preparation and construction could cause the spread of these species, but this will be mitigated by following clean equipment protocols and on-Site management. The project is unlikely to directly interact with Common Reed since this species was only observed in the wetland, an area which the project would avoid. However, following clean equipment protocols can be anticipated to prevent the spread of this species.

6.3 Wetland Functions

The existing parking area is within 0 m to approximately 6 m of the wetland. In areas where there is a buffer between the wetland and the existing parking lot, the buffer consists of mowed lawn with obvious signs of disturbance. The project incorporates a 5 m setback from the wetland and thus the minimal and mostly artificial functions currently provided by the wetland (i.e., flood and stormwater storage and water quality protection) would be retained. Given that the edges of the wetland are currently highly degraded through the presence of weeds, mowed lawn, loose gravel, and packed gravel, the implementation of a 5 m naturalized (i.e., planted) buffer would enhance the feature. The proposed 5 m buffer is expected to increase vegetation diversity and habitat structure (e.g., food, shelter, and shade). Changing the existing packed gravel of the adjacent parking area to paved asphalt will likely increase the amount of surface runoff to the wetland. However, since the wetland will no longer be used for snow storage, it is expected that the wetland will have capacity for additional stormwater retention. The implementation of a 5 m vegetated buffer around the wetland should also improve infiltration of stormwater and sediment capture. The existing culvert at the outflow of the wetland will be replaced, which will likely improve flows

and prevent flooding by allowing the movement of larger volumes of water through the system, if needed, to prevent backup and spillover of stormwater.

6.4 Species at Risk

Six SAR listed as Threatened or Endangered under the ESA and SARA have a moderate potential to interact with the project (i.e., may be present during development) based on occurrence data and the presence of potentially suitable habitat.

Barn Swallows nest on barns and other structures and forage in open areas for flying insects. Buildings on the Site and adjacent areas could provide nesting habitat, and open areas on and adjacent to the Site could provide foraging habitat. No Barn Swallows or Barn Swallow nests were observed on the Site during breeding bird surveys. In addition, the project would not involve alterations to potential nesting structures (buildings). The parking lot expansion area would retain open space similar to existing conditions and therefore potential foraging habitat in this area would remain. Accordingly, the project is not expected to negatively impact Barn Swallow or its habitat.

Red-headed Woodpecker occurs in open woodland and woodland edges, where it utilizes standing decadent and/or dead trees for nesting and perching. Areas containing critical habitat for Red-headed Woodpecker are based on observations of the species (ECCC, 2019). Open/edge habitats along the deciduous hedgerow on the northwestern edge of the Site may provide marginal habitat, although this hedgerow contained mostly healthy trees (Appendix E) and Red-headed Woodpecker was not observed on the Site. As such, the parking lot expansion area does not contain critical habitat for Red-headed Woodpecker and the species is not expected to be impacted by the project. Wooded areas adjacent to the Site are expected to provide much more optimal habitat for the species if it were present in the area. Clearing trees outside of the breeding season would minimize potential impacts to this species.

Little Brown Myotis, Northern Myotis, and Tri-coloured Bat may roost in buildings on the Site and in trees on or adjacent to the Site. These at-risk bat species may use open areas of the Site (e.g., lawn) for foraging, if roosting in the vicinity. However, the Mud Creek corridor south of the Site and nearby wooded areas would provide much more optimal roosting and foraging habitat given the anthropogenic nature of the Site. Potential impacts to these at-risk bat species would be mitigated by removing trees outside of the roosting season.

While not observed on the Site, Butternut could occur in the moist deciduous hedgerow on-Site. Butternut is commonly found on rich, moist, well-drained, loamy soil. Butternut surveys are typically considered valid for a period of two years. No impacts to Butternut are anticipated if tree removal occurs within two years of the time of tree surveys, the time at which Butternuts were confirmed absent.

6.5 Other Significant Natural Heritage Features

The nearby Natural Heritage System Core Area, which generally includes the Green's Creek Conservation Area, is separated from the actual development site by Innes Road, the OCDC facility itself, and a distance of >45 m. Given that the project involves improving an existing parking lot (i.e., an area that is already developed) it is not anticipated to negatively impact the ecological functions of Green's Creek Conservation Area or any portion of Natural Heritage System Core Area. Moreover, given both existing facility and road systems, the overall small project footprint located directly within the that development (which will continue to exist and function with or without the parking lot improvements), and the distance

from the natural heritage core area, the development as proposed cannot itself be considered as limiting or preventing future ecological improvements to the core area.

7.0 MITIGATION

7.1 Surface Water and Fish Habitat

Discharged stormwater from the Site will follow requirements of RVCA and the NCC. Snow management plans should also be reviewed and approved by the NCC to ensure no adverse impacts to nearby surface water features.

An erosion and sediment control (ESC) plan should be developed to the satisfaction of the NCC and is anticipated to include:

- A multi-faceted approach to provide ESC.
- Silt fence paired with sturdy construction fence along the project perimeter. This fencing can also act as a wildlife exclusion measure for smaller and less mobile animals such as amphibians, if present in the area.
- Retention of existing vegetation to the extent feasible, and rehabilitation of disturbed areas as soon as possible in order to reduce the duration of soil exposure.
- Limiting the duration of soil exposure (if applicable), phasing project works accordingly, and minimizing the movement of machinery on exposed soils.
- Limiting the size of disturbed areas by minimizing nonessential clearing and grading.
- Minimizing the total slope length and the gradient of disturbed areas.
- Refueling of machinery should occur >60 m from surface water features, including the wetland.
- Maintaining overland sheet flow and avoiding concentrated flows (if applicable). Employ measures to maintain or reduce overland surface water velocities (e.g., filter berms, hay bales etc.), and remove such measures upon project completion.
- Storing/stockpiling materials >30 m away from surface water features, including the wetland.
- Maintaining any erosion and sediment control measures until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the water body or settling basin, and runoff water is clear.
- Installing an anti-erosion fence around the perimeter of all excavated soil. All excavated soil should be stored outside of floodplains in areas approved by the NCC.
- Inspecting, maintaining, and repairing ESC measures on a weekly basis and after any rainfall event.
- Stabilizing areas of stockpiled or exposed soils using tarps or other similar covers.
- Ensuring a copy of the ESC Plan is available on the work site at all times.

Following project works, it is the Contractor’s responsibility to restore the Site to its original condition.

Plans pertaining to spills and hazardous materials should be developed to the satisfaction of the NCC and is anticipated to include:

- Any environmental spills (biological, chemical, or petroleum-based) must be reported to the NCC's 24-hour Emergency Communication Service
- Any release of potential contaminants, such as fuel, chemicals, or other hazardous materials, must be reported to the NCC immediately.
- A spill report form will be completed and sent to NCC Environmental Services within 24 hours of a spill. The Spill Report, Response and Review Lo will be submitted to the NCC Contract Manager and will include details on the spill.
- All spills must also be reported to the appropriate provincial authority where a spill 1) discharges to air, land, or water; 2) is in excess of normal usage; 3) has escaped its means of containment; or 4) has been combined with other products affecting its chemical stability, which could cause an adverse effect (e.g., on health, environment, or property).
- Spill response materials should be available wherever hazardous materials are used or stored. These spill response materials should be suitable in type and quantity to the type and quantity of hazardous materials being used at that location.
- All Contractors and their staff must be trained on how to use the spill material and equipment.
- All used absorbent material must be disposed of in accordance with applicable regulatory requirements.
- Spills must be contained and cleaned up in accordance with all federal, provincial, and local regulatory requirements.
- All hazardous materials and/or designated substances will be handled in accordance with all federal, provincial, and municipal requirements. Any hazardous and/or designated substances being removed from the Site will be removed by a licensed Contractor and will be transported to an appropriately licensed facility.
- Activities near water will be planned such that materials such as paint, blasting abrasives, rust solvents, degreasers, grout, or other chemicals do not enter the water body.
- Should any designated substance be encountered in the course of works, work must be stopped, precautionary measures taken, and the NCC must be notified immediately.
- All hazardous materials on NCC property must be stored in accordance with applicable regulations, standards, and guidelines. Flammable materials must be stored in accordance with the National Fire Code of Canada.
- Asphalt and/or concrete should either be mixed away from the Site or should be prepared on paved surfaces to minimize the effects of a spill.
- Washing of concrete trucks and other equipment used for mixing concrete should not be carried out within 30 m of the wetland.

7.2 Vegetation

Vegetation will be planted to offset vegetation removal. The NCC determines tree compensation requirements based on the loss of ecological features and functions. This is completed on a context-sensitive basis and is guided by the principle of "no net loss" at a minimum and preferably according to the principle of "net environmental gain".

Required tree removals were completed in 2022 under permit from the NCC. The NCC had provided the following preliminary tree compensation requirements:

- Trees >10 cm DBH require 2:1 compensation.
- Trees >30 cm DBH may require a different compensation ratio.
- Exact compensation requirements will be determined upon review of this report.
- Trees planted for compensation purposes must be native species, not hybrids or cultivars.
- Replacement coniferous trees should be at least 1.8 m in height. Replacement deciduous trees should be at least 70 millimetres (mm) caliper in size.

These requirements are reflected it the approved landscape plan.The Proponent/Contractor will be responsible for responsible for the appropriate reestablishment of grasses for the period of one year and of trees for a period of two years.

The following general protection measures were recommended for site preparation and construction, and should be in place throughout any and all works associated with the project:

- Vegetation removal is to be limited to that which is necessary to accommodate construction.
- Revegetation should be completed during growing season. If, for some element of the program, this is unfeasible, the Contractor must stabilize disturbed areas with erosion control blankets to keep the soil in place and prevent erosion in water bodies. Blankets must then only be removed at the end of the revegetation work.
- To minimize impacts to trees to be retained:
  - Erect a fence beyond the critical root zone (CRZ; i.e., 10x the DBH) of retained trees that have roots that may extend into the project area (i.e., within 2 m of construction activities). The fence should be highly visible (orange construction fence) and paired with erosion and sediment control fencing.
  - Pruning of branches is recommended in areas of potential conflict with construction equipment.
  - Any vegetation or tree debris that may fall or enter the wetland must be removed immediately with as little disturbance as possible.
  - Tree or shrub clippings or branches that show signs of disease or pests must be appropriately disposed of following all federal, provincial, and municipal regulations in order to minimize spread of the disease or pest.
  - Do not place any material or equipment within the CRZ of trees.

- Do not attach any signs, notices, or posters to any trees.
- Do not raise or lower the existing grade within the CRZ of trees without approval.
- Tunnel or bore when digging within the CRZ of a tree.
- Do not damage the root system, trunk, or branches of any remaining trees.
- Ensure that exhaust fumes from all equipment are not directed towards any tree's canopy.
    - Any damage to a tree must be reported to the NCC Contract Management Officer who will advise of the applicable mitigation measures to be implemented.

To prevent the spread of invasive, exotic, and noxious weeds via equipment, on-Site works should follow the *Clean Equipment Protocol for Industry* (Appendix H). Common Buckthorn, Creeping Thistle, and Perennial Sow-thistle are listed as noxious weeds under the *Weed Control Act*; the landowner therefore has a legal obligation to destroy these species. Since the NCC is the landowner, noxious weed management will be to their discretion. Management of existing noxious weeds on the Site may fall outside of the scope or requirements of this project.

7.3 Wetland Functions

As part of the ESC plan for the project, silt fence should be installed along the perimeter of the 5 m buffer around the wetland. This would prevent sediment, litter, or debris from entering the wetland while providing a physical barrier to ensure that construction works do not encroach into the buffer. The buffer should be densely planted with native trees and shrubs. Once established, plantings here are expected to prevent encroachment into the wetland. Soil used for landscaping should be of high quality and free of weeds. Fertilizers and other products containing phosphorus or nitrogen will not be used within 15 m of the wetland. Further, all activities that take place on NCC lands must be in full compliance with all federal pesticides legislation and regulations. Only products registered by Agriculture and Agri-Food Canada under the *Pest Control Products Act* may be used.

Whenever possible, machinery will operate on land above the high water mark to minimize disturbance to the wetland banks and bed.

7.4 Species at Risk

Potential impacts to at-risk fauna would be mitigated by following the general wildlife management recommendations below, particularly by removing vegetation outside of the breeding and roosting periods for birds and bats, respectively.

If tree removal is to occur beyond two years since the time of tree surveys (i.e., after June 2023), a Butternut sweep of the area to be cleared should be conducted by a qualified biologist to ensure the absence of Butternuts (i.e., to check for individuals that may have established since the surveys in June 2021). If detected, a Butternut Health Assessment is required to assess the health of Butternut trees and to determine appropriate mitigation and follow-up actions.

7.5 General Wildlife Management

The following mitigation measures should be implemented during project works to generally protect wildlife:

- Vegetation clearing should not take place during sensitive times of the year for wildlife (breeding season; early spring throughout summer) unless mitigation measures are implemented and/or the habitat has been inspected by a qualified Avian Biologist.
    - The MBCA protects migratory birds and the nests and young of migratory birds in Canada. No clearing of vegetation should occur during the breeding bird window (between April 15 and August 31; Government of Canada, 2018) to prevent impacts to birds. Combining the breeding bird window with the bat roosting season (May to September; MNRF, 2015b), no clearing of vegetation should occur between April 15 and September 30 inclusive to prevent impacts to both birds and bats.
- Do not harm, feed, or unnecessarily harass wildlife.
- Manage waste to prevent attracting wildlife to the Site. Effective mitigation measures include litter prevention and keeping all trash secured in wildlife-proof containers and promptly removing it from the Site, especially during warm weather.
- Drive slowly and avoid wildlife.
- Ensure the proposed works and noise levels emitted by all equipment and machinery are in compliance with the applicable municipal Noise Control By-law
- Manage stockpiles and equipment on the Site to prevent wildlife from being attracted to artificial habitat. Cover or contain any piles of peat, fill, brush, rocks and other loose materials and cap ends of pipes where necessary to keep wildlife out. Ensure that trailers, bins, boxes, and vacant buildings are secured at the end of each workday to prevent access by wildlife.
- The Proponent will ensure that all Contractors and their staff are trained to identify SAR that could potentially occur in the area.
- Check the entire work site for wildlife prior to beginning work each day.
- Inspect ESC measures and protective fence and/or other installed wildlife exclusion measures daily and after each rain event to ensure their integrity and continued function.
- In the event that a SAR is encountered in the construction area or inside a structure and does not move from the Site and construction activities would result in harm to the animal, all activities will stop and the NCC and ECCC will be notified to discuss mitigation options.
- Monitor construction activities to ensure compliance with the project-specific protocol (where applicable) or any other requirements.

8.0 CONCLUSION

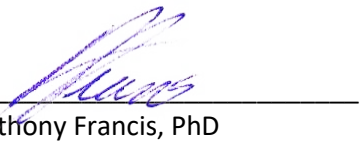
This report provides a set of mitigation measures for employment for the proposed parking lot expansion at the Ottawa-Carleton Detention Centre. Our assessment within this report of the potential for impacts to the natural heritage system is based on the implementation of these mitigation measures. It is our professional opinion that the proposed project would have no significant negative impacts on natural features or their ecological functions if all mitigation measures provided within this report are followed.

9.0 CLOSURE

This updated report was prepared for exclusive use by ECOH Management Inc. and may be distributed only by ECOH Management Inc. Questions relating to the data and interpretation can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.



Anthony Francis, PhD
Project Director

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Appendix A Qualifications of Report Authors

(For this report and the previous edition upon which it is based)

Kesia Miyashita, MSc

Ms. Miyashita has over six years of experience in environmental consulting and more than ten seasons of field experience in ecosystems in Alberta and British Columbia. During her career in environmental consulting, Ms. Miyashita has completed environmental assessments for a variety of major infrastructure projects and urban developments. Her expertise is in vascular and non-vascular plant ecology, with experience in both terrestrial and wetland ecosystems; she has performed vegetation community inventories, rare plant surveys, and weed surveys in a variety of natural environments, including native forest, urban nature preserves, grasslands, and wetlands. Ms. Miyashita joined Kilgour & Associates Ltd. in May of 2021 and has since contributed to numerous Environmental Impact Statements and tree conservation reports, delineation of natural heritage features and SAR surveys. Ms. Miyashita is a Professional Biologist with the Alberta Society of Professional Biologists and a Qualified Wetland Science Practitioner in the province of Alberta.

Anthony Francis, PhD

Dr. Francis is a Senior Ecologist with 20 years' consulting experience to both government agencies and private industry. He has worked on a diversity of projects relating to species at risk, invasive species, terrestrial and aquatic habitat, environmental effects monitoring and mitigation, and fate/effects of contaminants. Within each of these subject areas, Dr. Francis has completed projects addressing specific site concerns and broader policy initiatives. In the Ottawa area, Dr. Francis helps clients work their way through the land development process by producing key supporting studies such as Environmental Impact Statements and Integrated Environmental Reviews, and by obtaining various permits and approvals from local regulatory agencies including the conservation authorities and environmental Ministries. Dr. Francis is our local in-house geomatics specialist, capable of carrying out detailed and complex analyses of geospatial data of plant and animal distribution. He often utilizes his skills to carry out constraint studies prior to a client purchasing or planning a development for a property.

Appendix B NCC Comments

NATIONAL CAPITAL COMMISSION
COMMISSION DE LA CAPITALE NATIONALE

February 25, 2021

VIA E-MAIL

Domenico Giangregorio
COLLIERS PROJECT LEADERS

RE: Preliminary Comments on OCDC Proposed Parking Expansion

The purpose of this letter is to provide Colliers with preliminary comments on the proposed parking lot expansion at Ottawa-Carlton Detention Centre at 2244 Innes Road. NCC staff had the opportunity to meet internally and discuss the 33% Design Plans submitted on January 22, 2021.

Coordination with Municipal Planning Process

1. As part of the Federal Approval process with the NCC, the Proponent is required to satisfy the municipal planning requirements of the City of Ottawa, including obtaining necessary Zoning By-law Amendments (if applicable) and Site Plan Control Approval. As an initial step, the Proponent must request for a pre-consultation meeting with the City of Ottawa. Information on the pre-application process can be found here: https://ottawa.ca/en/pre-application-consultation.

2. The NCC will coordinate review of the proposal under the *National Capital Act*, with that of the City of Ottawa municipal planning process.

3. In the case of conflict between federal plans and/or policies and the municipal planning framework, the more restrictive plan, policy, guideline, or provision shall apply.

Canada's Capital Greenbelt Master Plan

4. The site is designated *Non-Federal Facility & Operations* in the Canada's Capital Greenbelt Master Plan (GMP). The NCC must be satisfied that the proposal aligns with the policies, guidelines and objectives of the Greenbelt Master Plan. Federal and Non-Federal facilities in the GMP will be carefully managed to control their footprint and ecological impact. Existing Non-Federal facilities are permitted; however, they are required to complement the roles of the Greenbelt and contribute positively to the Greenbelt's visual landscapes. The goal is to guide these facilities to be consistent with and complementary to the roles of the Greenbelt. Minor expansions of Non-Federal

facilities are permitted; however, the expansion must be consistent with the policies of the Greenbelt Master Plan (see Table 5.5; Policy 3, p.66 and 7.6 Mer Bleue Sector (p. 116).

5. Apply context-sensitive design best practices to the planning, design and location of parking facilities that aim to conserve the natural and visual resources. The NCC discourages expansion of existing parking surfaces and encourages shielded lighting and protection of the night sky. The NCC advocates avoidance of impact on habitats and eliminate if possible unnecessary lighting at the facilities to help achieve a night sky quality without compromising safety (Policies 6.7 “J and K” of the Greenbelt Master Plan).

6. The proposed parking expansion or any future projects on this site must respect the slope stability setbacks of Green's Creek as defined in the *2011 Green's Creek Fluvial Risk Study*. Continued efforts are required to improve the headwaters of Green’s Creek and its tributaries in this sector. The Greenbelt Master Plan encourages to work with the proponent to ensure the protection of fluvial geomorphology, particularly those addressing erosion control thresholds. The NCC requires that integrated stormwater management measures for the proposed parking expansion to mitigate fluvial geomorphological risks to the Greenbelt unstable lands at the southern limits of the site (Greenbelt Master Plan policies of Section 6.3.1.2 (b) and Section 7.6 (Q).

Site Design & Landscaping

7. Existing parking areas on site have been expanded without required approvals from both Federal and Municipal approval authorities.

8. Any approved parking on the site must substantially support the protection of the Natural Environment of the Greenbelt in accordance with the guidelines and policies contained in the Greenbelt Master Plan.

9. Plans must show all parking areas, including the existing parking at the front of the facility. It is unclear from the 33% design plans, what is approved parking and what is proposed parking subject to approval.

10. Generally, the Proponent must follow the principles of “greening parking lots” which are as follows:
    - planting and protecting trees;
    - providing good quality soil and generous landscaped areas;
    - managing stormwater on-site;
    - reducing the urban heat island effect; and
    - using sustainable materials and technologies.

11. The NCC requests that the paved connection between the visitor parking and staff parking lot be removed. Since there is a desire on site to maintain these two parking lots as being distinct from one another, this connection does not serve a purpose. Eliminating it would reduce the overall paved area on site.

12. The NCC is not supportive of parking in front of the facility due to tree removal and soil compaction. Maintaining a landscaped buffer between the facility and Innes Road is important from both a visual and environmental perspective.

13. The Proponent shall use continuous landscaping and signage to reinforce pedestrian walkways within parking areas and delineate which parking areas are for staff and visitors.

14. The width of drive aisles must be shown on the plans. The standard width for a two-way traffic is 6.7 metres.

15. Parking space dimensions must be shown on the plan. A single spot can be highlighted to show the dimensions. A standard parking space size is 2.6 metres by 5.2 metres. Parking spaces should never exceed 3.1 metres in width.

16. Consideration should also be given to providing small car spaces, which must be properly signed. Small car spaces typically measure a minimum width of 2.4 metres and a minimum length of 4.6 metres. More information about the permitted number of small car spaces will be provided through the municipal planning process.

17. The hatched areas at the end of rows of parking cannot be painted lines. They must be raised landscaped islands with proper curbing. If these areas are left simply as painted lines, vehicles may elect to park in these areas and only perpetuate the existing unsightly parking situation on site.

Parking Rates & Parking Study

18. Providing the minimum required parking spaces should be an objective of the site, especially given the site's location in the Greenbelt.

19. The Parking Study provided by Stephenson Engineering dated September 27, 2018 does not reflect the 33% design plans. One option in the Parking Study indicates that a total of 248 parking spaces are proposed on site (new & existing). The second option indicates that a total of 319 are proposed. The 33% design plans show a total of 305 (74 existing + 231 new). An addendum to this parking study is required that shows all existing and proposed parking spaces on the site. The rates must align with what is proposed on the plans.

20. The Parking Study also appears to show proposed parking spaces beyond the property line, which is not permitted.

21. The Parking Study does not contain a proper analysis of parking demand during peak periods or provide parking demand information for staff and visitors of the facility. The Study provides lists a total number of staff and correctional officers, however, provides no analysis or assessment about shift times and the feasibility and appropriateness of shared parking on the site depending on the time of day.

Environmental Considerations

22. The vegetation feature F may meet the federal definition of a wetland. This feature should be preserved and protected in the design of the parking lot expansion. The NCC is subject to the Federal Policy on Wetland Conservation, and removal of the feature may trigger compensation requirements and project review by Environment and Climate Change Canada.

23. Existing trees to be protected (with high visibility fencing installed at the perimeter of their critical root zones). The Proponent should provide a Tree Inventory Plan showing the size (DBH), species and health condition of trees which may be impacted on the site, including removals and trees to be preserved. Tree removal must be pre-approved by the NCC. A replanting/landscape plan must be developed to ensure compensation for trees removed. The NCC requires all trees ≥10cm DBH removed from federal land in the Capital Region to be compensate. The compensation scenario for the loss of ecological features and functions is determined on a context sensitive basis and guided by the principle of 'no net loss' at a minimum and preferably according to the principle of 'net environmental gain'.

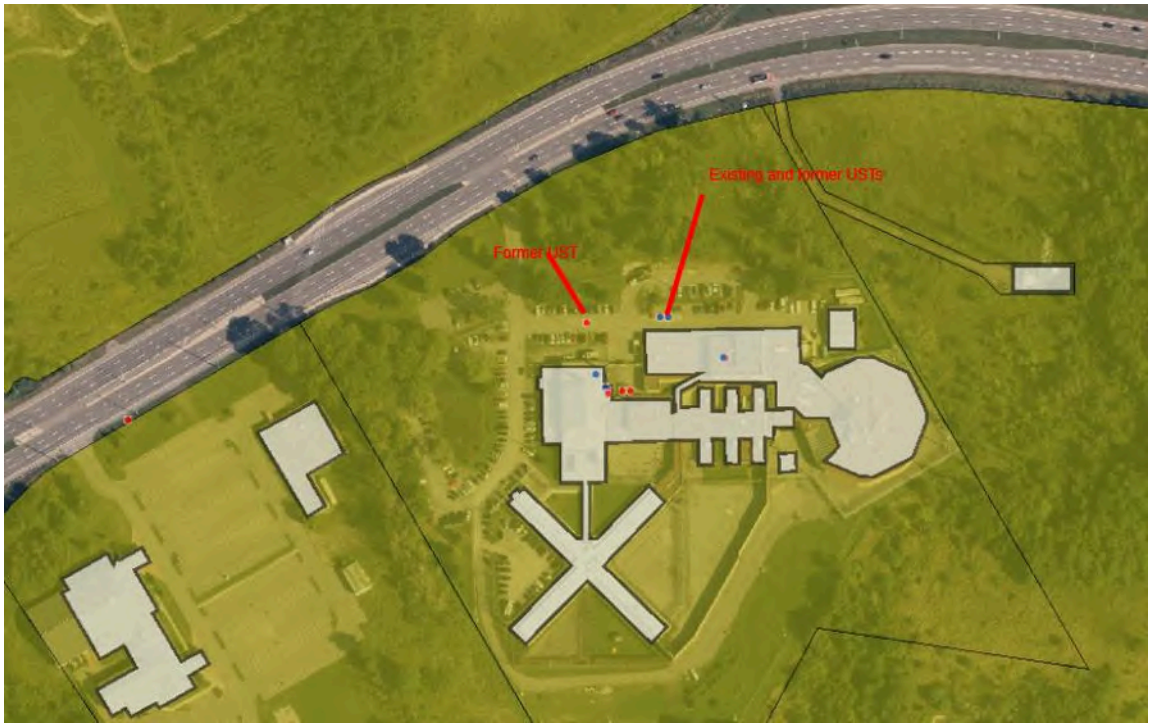
24. The 33% design does not indicate installation of lighting as part of the parking lot expansion. Will lighting be included? The NCC requires outdoor lighting to be compliant with "dark sky" principles. The City of Toronto's Best Practices for Effective Lighting, publicly available online, should be consulted in development of a lighting design. The lighting design (if applicable) should be submitted for NCC review.

25. Erosion and sediment control notes are included in the 33% drawing package. Page C2, notes "Install silt fence in location shown" but the location of required silt fencing is not indicated on the C1 drawing, nor is a sediment fence detail provided in C2.

26. More information is requested regarding the stormwater management and snow management approach. Specifically, how will water quality and quantity being managed to ensure no adverse impacts to nearby surface water?

27. Has porous asphalt been considered as a paving material?

28. A review of NCC records indicates existing and former underground fuel tanks as depicted on the image below. Will the project affect these storage tanks?



Impact Assessment Process

29. Projects on federal land are subject to the federal Impact Assessment Act (IAA). Before an NCC Federal Approval can be issued or construction can begin, the NCC must determine pursuant to the IAA that the project is not likely to cause significant adverse environmental effects.

30. Attached to these comments is the document “Interim Guidance on sections 81 to 91 of the *Impact Assessment Act”.*

31. A draft Project Description, prepared according to the information requirements of the attached document, should be submitted as soon as possible. Once the draft Project description is received, it will be reviewed by the NCC’s Communications. The OCDC team will be required to incorporate any revisions requested by NCC Communications and provide the NCC a French translation. The final English and French versions will be posted by the NCC to the Impact Assessment Registry, and a minimum 30-day public comment period will begin.

32. The draft Mitigation Measures Form (MMF), prepared according to the information requirements previously provided, should be submitted with the 66% design package. The revised Species at Risk Assessment Report should also be submitted with the 66% design package.

33. The NCC's Archaeologist has reviewed the OCDC parking proposal. In addition to having a low pre-contact archaeological potential, the location concerned also has a low potential for historical archaeological resources. No archaeological investigation or monitoring of project work is thus required. This advice should be integrated into the draft MMF.

Species at Risk Assessment Report

34. Invasive species on site should be listed, their distribution mapped, photographs included in the report as well as relevant mitigation measures.

35. If the vegetation feature F 'the depression' (SAR report, August 2020) meets the federal definition of a wetland, a proper wetland delineation, characterization and function assessment is needed. Federal lands are subject to the Federal Policy on Wetland Conservation with the goal of "no net loss of wetland functions". The federal wetland classification system uses the National Wetlands Working Group's (1988) definition of a wetland: "land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity which are adapted to a wet environment" (Hanson et al., 2008). This definition does not specify size criteria for wetlands as in OWES, and therefore may be considered a wetland from a federal perspective. For full due diligence, please use the wetland ecological functions assessment tool provided in the federal wetland classification guidelines (Hanson et al., 2008) to assess the wetland function of this 'depression'.

36. A map showing nearby streams (Mud Creek and Green's creek) needs to be included in the report as well as a discussion on the project potential impacts to nearby streams and mitigation measures needed.

37. The background review and target species list should include fauna and flora species at risk (SAR) and species of conservation concern (SOCC). Federally listed species do not seem to have been considered. A SAR is defined as: Endangered and threatened species that are listed under Schedule 1 of the federal SARA, Endangered and threatened species that are listed under the SARO. SOCC are defined as: Special concern species on the SARO list, Species with special concern status assigned by COSEWIC regardless of its listing on Schedule 1 of SARA, Species with provincial ranks of S1 to S3 (NHIC).

38. ELC codes should be used for the detailed vegetation community description and a detailed mapping of each vegetation communities is needed.

39. A detailed tree inventory describing and mapping each tree ≥10cm diameter at breast height (DBH) is needed for the site. For each tree we must know the species, DBH, condition and potential as a bat maternal roost.

Approval Process

To reiterate some of the information previously provided by Kelly Wojnarski**,** in her email from October 14th, below is some additional information about the Federal Approvals process.

1. This project is Level 2 FLUDA – this means it is subject to e-vote by the NCC Board of Directors (e-votes occur weekly).
2. The e-vote process generally occurs at the 99% design or pre-tender stage.
3. The submission requirements to be submitted with the Step 2 form include:
    - Completed and signed Step 2 form (attached)
    - Submission Requirements outlined below.
4. Please note that there is a review fee of $2,000 plus tax, associated with the federal approval. The payment is typically processed when the Step 2 form is submitted and reviewed. Please confirm who will be paying the processing fee when the Step 2 form is returned.

Submission Requirements

The following submission requirements are required to be submitted as part of the Federal Approvals process. Submission requirements pertaining to the necessary municipal planning approvals will be provided by the City of Ottawa following a pre-consultation meeting.

1. A copy of plans and reports submitted as part of the municipal planning process.
2. Written 1-2 page project description including scope and timelines.
3. Recent site Photos of existing parking areas on site – taken in Winter 2021 or Spring 2021
4. The following plans:
    - Site Plan;
    - Site Grading Plan;
    - Stormwater and Drainage Plan;
    - Geotechnical Report;
    - Landscaping Plans, including Tree Removal and Planting Plans; and
    - Lighting Plan.
5. Revision or addendum to Stephenson Engineering Parking Space Study dated September 27, 2018.
6. Documents necessary for the Environmental Assessment process, including:
    - Project Description;
    - Draft Mitigation Measures Form (MMF); and
    - Updated Species at Risk Assessment Report.

Attachments:

Attachment 1: Interim Guidance on sections 81 to 91 of the *Impact Assessment Act*
Attachment 2: NCC Step 2 Form

Thank you for the opportunity to comment and provide input at this early stage in the process.

Sincerely,

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National Capital Commission
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cc.

Martin Barakengera, NCC
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Camille Tremblay, NCC
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Isabelle Hughes, NCC

NATIONAL CAPITAL COMMISSION
COMMISSION DE LA CAPITALE NATIONALE

November 4, 2022

VIA E-MAIL

Domenico Giangregorio
COLLIERS PROJECT LEADERS

RE: Comments on OCDC Proposed Parking Expansion – 66% Resubmission and comment responses

The purpose of this letter is to provide Colliers with directions to advance the design of the proposed parking lot expansion at Ottawa-Carlton Detention Centre at 2244 Innes Road, and provide comments on the environmental impact assessment submission.

NCC staff direction and comments are based on the 66% drawings dated 2022-02-02, the Draft Parking Study dated 2022-09-23, the Environmental Impact Study dated 2022-05-02, the Slope Stability Report dated 2022-07-29, and the Responses to the 66% comments dated 2022-09-23.

While NCC staff cannot approve a 66% design layout, the below comments indicate acceptance of key components of the layout and areas where further options exploration or revisions are anticipated. It is therefore expected that the Proponent will advance the design development for the parking lot based on the provided proponent responses (2022-09-23) and the below summary of design direction to submit an updated design (around 80-90% design development) for review and comment ahead of a complete submission (target of early January 2023 required to meet requested construction start). See submission requirements section below for further details.

Summary Direction for Parking Lot Design

1. The updated parking study is accepted and the requirement for a transportation demand study is considered complete. NCC staff acknowledge the limitations on transportation demand management measures at this time, and accept the requested number of new parking spaces per the submitted 66% designs (February 2022).
    a. Proposed measures, such as providing sheltered bicycle parking, will be key to ensuring non-single occupant vehicle options remain available to site visitors and employees.
    b. The Proponent is encouraged to continue pursuing further measures to support transportation alternatives for visitors and employees, such as working with OC Transpo to improve bus routes and scheduling to meet shift needs.

2. The 1 metre buffer between the parking spaces and the Western fence (boundary of OCDC leased area) is accepted.
3. The irregular layout of the parking spaces is accepted. Where feasible, measures to ensure the safety of pedestrians moving through the parking lot are to be incorporated within the irregular layout.
4. The NCC acknowledges and accepts the use of non-permeable paving material based on maintenance and operational requirements. To mitigate this impact, further iterations of the design must continue to minimise paved areas and incorporate landscaped areas (minimum 15% of the parking lot area) that can support water infiltration and retention.
5. Integrate barriers at the edge of the paved parking areas to prevent vehicles from parking on natural features such as the wetland buffer and under trees.
    a. NCC staff agrees with the Proponent's intention to avoid altering the drainage pattern of the site. However, it remains possible to provide landscaping or other appropriate solution that will prevent vehicular access to these areas while still permitting surface water flow. For example, appropriate solutions could include curbing with curb cuts or a barrier above ground such as a low fence, guardrails or bollards. See example images below:



6. The parking lot landscaping plan must provide for shading of 40% of the parking lot in summer months by the time the replacement trees reach maturity to appropriately mitigate urban heat island effects of the parking lot redevelopment. A canopy and sub-canopy approach is encouraged, where some shrubs will eventually be shaded by trees. See comments on the EIS below for detailed recommendations.
7. While accommodating the safety and security lighting requirements of the site, the lighting plan for the parking lot must include "dark sky compliant" and bird safe lighting that lights only the required areas of the parking lots and at minimum, does not spill light outside of the site or into the sky. NCC staff appreciate the effort to minimize light spill into the wetland area and are looking forward to seeing options presented when the updated design is submitted.
8. The NCC will require that all proposed plantings be native, non-invasive species.
9. See previously issued letters for additional guidance on NCC expectations, as needed.

Environmental Review and Impact Assessment

1. **Environmental requirements** – NCC staff appreciate that multi-jurisdictional review is required for this project. From an NCC perspective, given that the land is federally-owned, neither the EIS nor the provincial Class EA may be considered a substitute for the information requirements previously identified to comply with the federal Impact

Assessment Act (IAA). To meet federal IAA requirements, which is necessary before a Federal Land Use Approval may be issued to allow the project to proceed, the proponent is required to submit the following documentation:

A. Project Description for Impact Assessment Registry: As part of the IAA review process, NCC staff must post a project description to the Impact Assessment Agency's public registry. The posting must remain active for public comment for a minimum of 30 days. The proponent team is asked to use the guidance in Appendix A to draft a project description that can be posted to the registry, and return this to the NCC as soon as possible.
B. Environmental Effects Analysis – Mitigation Measures Form (MMF): The MMF (please see template in Appendix B) must propose established and effective mitigation measures for all potential environmental effects of the project's construction and operation. The mitigation measures in the EIS for Surface Water and Fish Habitat, Vegetation, Wetland Functions, Species at Risk, and General Wildlife Management are a good start and should be included in the MMF also, however the MMF will additionally require mitigation measures for:
    a. Effects related to soil quality: The MMF should summarize the results of soil quality studies. If the project will produce excess soil, the proponent must follow O. Reg 406. NCC staff understand that this regulation requires that an assessment of past uses be completed, unless a Phase One ESA within the meaning of O. Reg 153/04 has been prepared in respect of the project, followed by the soil characterization program and soil management plan. A Qualified Person (QP) should be engaged for this work, if this has not yet occurred.
    b. Effects to archaeological resources: Though the project site has a low potential for both pre-contact and historical archaeological resources, requiring no archaeological investigation or monitoring, the MMF should identify protocols in the event of unexpected discovery of archaeological resources. NCC staff recommend the following language: "If any archaeological resources or human remains are discovered during project activities, stop all work at the location concerned immediately, and contact the NCC's Archaeology Program (Archaeology-Archeologie@ncc-ccn.ca, or Ian Badgley (613) 239-678 ext. 5751, Ian.Badgley@ncc-ccn.ca), which will be responsible for contacting the appropriate authorities. Work shall not be resumed at that location until measures for the protection of the resources or remains have been put in place."
    c. Effects to ambient environment and air quality: Mitigation measures for control of dust, exhaust emissions, and noise must be identified.
    d. Effects related to climate change: Mitigation measures that have been incorporated into the design of the parking lot to enhance its sustainability must be identified (e.g. vegetation shading to minimize heat island effect, design approach to reduce impervious surfaces to the minimum required, integration of bioswales and surface water retention mechanisms).
    e. See Appendix C for example mitigation measures to be prepared (as relevant for this project) for the MMF, in addition to the content from the EIS.
C. See section below for comments on the Preliminary Environmental Impact Study.

2. **Lighting** – To the greatest extent possible, while ensuring employee safety, the proponent must integrate "dark sky compliant" and bird safe lighting. On past parking lot projects, NCC staff have observed that full cut-off light fixtures, lighting temperatures below 3000 Kelvin, and lighting controls and sensors may be employed while still promoting a safe user experience. NCC staff will review the lighting plan for the project once received.
3. **Landscaping** – Given the results of the characterization and function assessment of the wetland provided in the EIS, a 5m buffer could be supported by the NCC, however it must remain vegetated and physical design elements must protect the wetland and its 5m vegetated buffer from encroachment, including by parked vehicles.

NCC staff comments on the Preliminary Environmental Impact Study (EIS)

- General – the EIS provides a detailed characterization of the existing ecological site conditions, and satisfies the NCC's identified ecological study requirements, including the Tree Inventory and Species at Risk Assessment Report, and Wetland Characterization / Delineation.
- General - As stated above, the EIS report cannot be considered a substitute for the federal IAA process, which requires a Mitigation Measures Form and Registry Posting. However, the content of the EIS can be used to populate the MMF.
- 1.1. Property Information – Marion Gale, Senior Land Use Planner, has replaced Kate Goslett as the primary NCC contact person.
- General – 7.0 Mitigation – Example Mitigation Measures from the NCC can be used to enhance this section.
- 7.1 Surface Water and Fish Habitat – NCC staff wish to review the snow management plans and sediment and erosion control plan once available. Mitigation measures for spills should be added.
- 7.2 Vegetation – In consideration of the results of the tree inventory and the 17 trees identified for removal, the NCC will require a minimum of 25 caliper trees to be replanted (replacement deciduous trees shall be at least 70mm caliper in size, and replacement coniferous trees shall be at least 1.8m in height), in addition to a minimum of nine 5-15 gallon shade tolerant shrubs. A canopy and sub-canopy approach is encouraged, where some shrubs will eventually be shaded by trees. To appropriately mitigate urban heat island effects of the parking lot expansion, the NCC will require that 40% of the parking lot be shaded by time the replacement trees reach maturity. A landscape architect can calculate the percent cover of shaded area during development of the landscape plan, by assessing the current canopy surrounding the parking lot and the anticipated shading of the compensation trees at maturity. Given the parking lot context, species must be selected for salt tolerance, and climate and disease resilience. For example, White Pine is no longer a favoured tree due to more frequent weather events (they cause damage when they snap, especially when subject to strong wind bursts). The replacement trees and shrubs shall be warrantied for two years.

- 7.2 Vegetation – Any disturbance within the CRZ of a tree to be retained – e.g. tunneling, boring, excavation – must be supervised by an arborist.

NCC staff comments on the Slope Stability Assessment

NCC staff acknowledge receipt of the Slope Stability Report.

As this report was required by the RVCA, NCC staff request that it be shared with RVCA staff for their feedback. Please share any comments from the RVCA, or revised versions of the report (if necessary), with NCC staff for NCC records.

Outstanding Deliverables to Support NCC Review and Approval

1. Project Description for Impact Assessment Registry
2. Draft Mitigation Measures Form
3. Lighting Plan
    - Include options for directed lighting to reduce or eliminate light spill into the wetland area
    - Provide ministry response with regard to lighting brightness and colour temperature.
4. Landscape Plan
    - Include list of options other than grass for the landscape buffer around the wetland area to promote increased water retention and infiltration.
    - Identify the proposed locations and species for the required tree compensation
5. Snow Management Plan
6. Sediment and Erosion Control Plan
7. Stormwater Management Plan
8. Updated and further developed plans and drawings for the parking lot (80-90% design development)
    - Include details as necessary to demonstrate compliance with above design direction and provided responses to previous NCC Comments.
9. See the attached "Step 2 Form" (Appendix D) for a full list of the documents required for a "complete submission" and the Submission Requirements section below for further details on the requested documents. Once all of the documents and studies identified in the "Step 2 Form" have been received, NCC staff can review the application for approval. See the Proponent's Guide on our website for typical review and approval timelines (Level 2 project).

Based on the target for Spring 2023 initiation of construction and required tree cutting (prior to April 2023), an approval date of end of February 2023 should be targetted. **In order to meet the target approval date, a complete submission should be received no later than January 2, 2023**.

Preliminary or draft versions of documents should be submitted prior to January 2023 to obtain NCC staff comments on updated plans and to complete the required Impact Assessment Act

requirements, including a 30-day registry posting. NCC staff are available to discuss the above design direction, comments or updated plans as required to support design development.

It is also recommended that the Proponent submit their Site Plan Control application to the City of Ottawa as soon as possible to ensure that any required revisions from the City of Ottawa can be incorporated into the complete NCC submission in time to meet the project schedule objectives.

Submission Requirements

The submission requirements for a complete application under the Federal Approvals process are identified in the attached draft "Step 2" Form. The "Step 2" Form should be read as identifying required information and plans; the required information may be packaged in order to meet requirements for other regulatory authorities such as the City of Ottawa. Where specific standalone reports or standardized formats are required, they are identified below.

In addition to the submission requirements identified in the Step 2 Form, please provide the following:

A. Information to finalise the draft Step 2 Form (attached):

    a. Confirmation of Proponent Entity

        i. A person at director-level or equivalent with authority to sign on behalf of the Government of Ontario should be identified. The approval letter will be issued to that person.

        ii. Consultants and contracted project managers (i.e. Colliers Project Leaders) may continue to act as the main contact point for the approval even though they would not be identified as the "Proponent".

B. A copy of all plans and reports submitted to the City of Ottawa for the municipal site plan control application.

C. A copy of all plans and reports submitted to the Rideau Valley Conservation Authority for their review.

D. A copy of the comments or responses provided by the City of Ottawa and RVCA.

Submission requirements detailed information:

Site development and landscape plans

- Plans should clearly show the different surface treatments (maintained from existing and new) - shading is identified in the legend but not in the plans

- A separate landscaping plan should be provided that clearly identifies trees proposed for removal (with an X), trees retained (symbol for existing trees) and

proposed new plantings (symbol for new trees and vegetation, showing tree compensation and other landscape buffer elements).

- The landscaping plan should be stamped by a landscape architect.
- The landscaping plan should show the species of the existing and proposed trees, as well as details of the proposed planting and landscaping methods, including soil requirements, etc.

- Clearly indicate the property/lot line on the plans, ensure that the "limits of work" line encompasses all proposed works, and identify the meaning of all the line types in the legend (e.g. red dashed line, zigzag line, etc).
- In addition to plan views, provide sections showing the structure of the proposed surface (thickness, supporting fill, etc.) and the design of buffer treatments (e.g. curb and landscaped no parking areas)
- Please provide information on pedestrian and cyclist mobility/movement, indicating key origins and destinations adjacent to and within the site, such as building entrances and egress, bus stops, bicycle parking, visitor access gates, etc.. Anticipated pedestrian and cyclist movements across the site and through the parking area should be clearly indicated, with potential conflict zones with vehicular movements and the proposed treatment to reduce the risk of collisions identified.
    - This requirement could be addressed within the site and landscape plans, as per the City's request to show the pedestrian network on these plans.

Regulatory Framework

- Please provide an analysis of how the Proposal responds to the applicable NCC plans and policies, including the requirements identified at the start of the letter, in addition to information about how other regulatory requirements or reviews are being met (i.e. EA process, municipal bylaws and design guidelines, conservation authority review.).
- Please include with your submission a zoning compliance table indicating a breakdown of your proposed development along with indication of whether the site conforms to each applicable section of the zoning by-law.
    - Please specifically include a breakdown of your required and provided Accessible Parking, with reference to the applicable regulation or zoning by-law.
    - Please specifically include a breakdown of your required and provided Bicycle Parking, with reference to the applicable regulation or zoning by-law.

Impact Assessment Act

- A draft Project Description, prepared according to the information requirements of the attached document, should be submitted as soon as possible. Once the draft Project description is received, it will be reviewed by the NCC's Communications. The OCDC team will be required to incorporate any revisions requested by NCC Communications and provide the NCC a French translation. The final English and French versions will be posted by the NCC to the Impact Assessment Registry, and a minimum 30-day public comment period will begin.

- The NCC's Archaeologist has reviewed the OCDC parking proposal. In addition to having a low pre-contact archaeological potential, the location concerned also has a low potential for historical archaeological resources. No archaeological investigation or monitoring of project work is thus required. This advice should be integrated into the draft MMF.

Attachments:

Appendix A: Project Description for IAA registry
Appendix B: Mitigation Measures Form template
Appendix C: Example Mitigation Measures
Appendix D: Draft NCC Step 2 Form

Please advise if you would like to schedule a meeting to go over the comments provided in this letter and the draft "Step 2" Form.

Sincerely,

Marion Gale
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National Capital Commission
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cc.

Natalie Glancy, NCC
Alexander Stone, NCC
Ted Horton, NCC
Isabelle Hughes, NCC
Natalie Bélanger, NCC
Christopher Hetherington, NCC
Michael Boughton, City of Ottawa
Jamie Batchelor, RVCA

Appendix C City of Ottawa Pre-consultation Meeting Minutes

Pre-Consultation Application 2244 Innes Road – OCDC – City of Ottawa Internal Department Comments

Transportation:

- A TIA is not required for a parking expansion.
- A screening form is not required.
- Noise study is not required.

Environmental:

Tree Conservation Report Requirements:

- A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
    - An approved TCR is a requirement of Site Plan approval.
- As of January 1 2021, any removal of privately-owned trees 10cm or larger in diameter, or publicly (City) owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
- The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
    - If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
    - Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
- The TCR must list all trees on site by species, diameter and health condition
- Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
- The TCR must list all trees on adjacent sites if they have a critical root zone that extends onto the development site
- If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
- All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
- The location of tree protection fencing must be shown on a plan

- Show the critical root zone of the retained trees
- If excavation will occur within the critical root zone, please show the limits of excavation
- The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

Landscape Plan Tree Planting Requirements:

Minimum Setbacks

- Maintain 1.5m from sidewalk or MUP/cycle track.
- Maintain 2.5m from curb
- Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.
- Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

- Curb style planter is highly recommended

- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please ensure adequate soil volumes are met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

For additional information on the following please contact tracy.smith@Ottawa.ca

Urban Design:

- A design brief is required. Please see attached terms of reference.
- Please provide additional landscaped area and tree coverage within the proposed parking area.
- Please ensure that all parking spaces are functional and have adequate ability for turning movements.
- Efforts to retain the existing vegetation abutting Innes Road should be undertaken, and any parking expansion, should not be located closer to Innes Road than the existing parking area.

Planning:

- Comments provided by Michael Boughton, Senior Planner, Development Review - East

- **Official Plan:** The City's Official Plan (OP), Schedule B, designates the subject site "Greenbelt Employment and Institutional Area" for the entire property, which is in the NCC Greenbelt. Section 3.5 and 3.5.2 of the OP outlines the applicable land use policies, the more notable of which include those highlighted below. The proposed development is also to conform with other relevant OP policies, specifically Section 4.11 as may be applicable.
  - Policy 1 of Sec. 3.5 states that the policies for the Greenbelt in the City's Official Plan implement the provisions of the NCC Greenbelt Master Plan.
  - Policy 1 of Sec. 3.5.2 states in part that lands designated Greenbelt Employment and Institutional Area permit institutional, cultural, recreational and research facilities provided that, c) the programming, land use, and landscape character of these facilities respect the Greenbelt's rural character and benefit from an extensive open area, isolation or a rural environment.

- **Zoning By-law 2008-250:** The site is zoned "Rural Institutional" subject to Rural Exception 233r (RI5[233r]). The Exception simply recognizes a "correctional facility" as an additional permitted use. A link to the relevant zone provisions is provided.

Rural Institutional (RI5): https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/planning-development-and-construction/maps-and-zoning/zoning-law-no-2008-250/zoning-law-2008-250-consolidation/part-13-rural-zones-sections-211-236#ri-rural-institutional-zone-sections-223-and-224

  - Sec. 69 of the Zoning By-law is to be complied with.
  - Part 4 – Parking Provisions of the Zoning By-law are to be complied with, in particular, Sec. 101, 102, 106, 107, 109, and 110.
  - Note that Sec. 110 requires a minimum landscape buffer of 3.0 metres from a lot line to any part of the proposed parking area.
  - The applicable parking rate (Sec. 101) for a correctional facility is 1sp./100 sq.m. GFA. We may discuss whether to exclude cell blocks from the floor area calculation.

- **New Draft Official Plan:** For information purposes only, the new draft City of Ottawa Official Plan, which is scheduled to be presented to Committee(s) and Council later this October 2021, designates the subject site as "Greenbelt Facility" on Schedule B4 of the Greenbelt Transect. The proposed policies that apply to Greenbelt Facility, Sec. 8, would apply once the new OP has been approved by the Ministry of Municipal Affairs. It is recommended that you take note of these draft policies in the event the site plan control application affecting the subject site is filed after Council's adoption of the new OP.

- **Comments:**
  - The proposed parking area modifications and expansion are to respect the provisions of the NCC Greenbelt Master Plan.
  - Consideration is to be given to protecting as many trees as possible and avoid tree removal, particularly along the site's front yard.
  - Appropriately designed lighting is to be provided throughout the parking area.
  - It appears from the images provided in the parking study that segments of existing fencing may require resetting or replacement.

- Planning staff will focus on traffic and pedestrian circulation within the parking area, the design of the space – parking space dimensions, drive aisle widths, and landscaped islands – to provide opportunities for tree planting/greenspace and to aid in efficient traffic circulation.
- Clearly show on the site and landscape plans the pedestrian network to/from the main facility.
- Consideration should be given to providing additional and replacement tree planting along the west side yard and front yard of the parking area expansion/improvements to provide the enhanced screening from Innes Road and the adjacent property.
- Submission Requirements (Planning) – planning rationale, dimensioned site plan and landscape plan (stamped by LA), lighting plan, site survey plan, revised parking study (should reference parking requirements in Zoning By-law 2008-250).

Engineering:

- Servicing: On Innes Rd., there is an existing 400mm. dia. watermain (feedermain) with a private water supply to the buildings, a 525mm dia. sanitary trunk sewer, as well as 300mm. dia. storm sewer on the north side of Innes Rd., and a 750mm. dia. storm trunk sewer on the south side, where few catchbasins on the subject site are connected to. Overall, there appears to be an internal storm network consisting of catchbasin manholes, ditch inlet catchbasins, catchbasins and various diameter storm sewers situated to the east of the access road, running along the eastern portion of the site, where a stormwater detention area exists. It is at this point where we see a significant grade difference at the southern end of the site. Here, there has been grading and drainage works carried out in the past to capture the stormwater via manhole catchbasin, catchbasin and storm sewer network. However, in the absence of an exhaustive storm sewer network, the Applicant shall demonstrate managing stormwater through, for example, sustainable approaches (see LID note below).

  As part of the servicing component, the Applicant is recommended to consult the City's geoOttawa website: (http://maps.ottawa.ca/geoOttawa/) for basic information regarding the municipal services on Innes Rd.

- Geotechnical Considerations: The area within close vicinity to the subject site consists of silty clay. These can bring some constraints along with them, specifically:
  - grade raise restrictions
  - slope stability (around drainage features)
  - relatively high groundwater levels.

- Tree Planting and Clay Soils: With the geotechnical considerations, the City's planting policies should be consulted with respect to planting restrictions and requirements. Also, it is recommended that the Applicant refer to the comments provided by the City's Forestry team for this pre-application consultation with respect to this note.

- Stormwater Management: the subject site falls within the Mud Creek subwatershed, where it ultimately empties into the Green's Creek watershed. The Mud Creek Cumulative Impact Study (CIS), which was finalized in February 2021, speaks to existing conditions, erosion thresholds, mitigation alternatives, modelling for water quality and quantity, for a study area that's limited to the reaches of Mud Creek upstream of Renaud Rd., and north of the rail corridor. Further information regarding this study can be obtained through Development Review staff, and is to be consulted accordingly. Per NCC comments, the Greenbelt Master Plan and the Green's Creek Fluvial Master Study are also to be consulted and integrated, accordingly.

  Alongside the stormwater management component, please ensure that the RVCA is circulated and have provided their comments and requirements on the water quality control, accordingly.

- Low Impact Development (LID): To echo the NCC's comment pertaining to following the principles of "greening parking lots", the Applicant is to look into the implementation of LID best management practices. However, with clay soils present, there may be low permeability, and in turn, limited infiltration volumes. Nonetheless, the Applicant is to consider LIDs and provide rationale in the servicing and stormwater management report on its effectiveness in the development, in accordance with the Ministry of the Environment, Conservation, and Parks (MECP) and City of Ottawa guidelines for development.

- Development Charges (DC): The site is subject to development charges for the works associated for Greenbelt Development, with registration or upon the issuance of first conditional building permit, whichever comes first. Further information regarding this, as well as DC calculations, exemptions, indexing of rates can be obtained through Gary Baker, DC Program Coordinator (gary.baker@ottawa.ca).

- MECP ECA: Please note that this site may be subject to an MECP Environmental Compliance Approval (ECA). Please refer to the Servicing Memo for further information.

- Please find attached additional engineering comments for the proposed development.

Application Type and Fees:

- The Application Fees (2021 Rates) for the applications are as follows:

Application Type	Planning/ Legal Fee	Initial Engineering Design Review & Inspection Fee	Conservation Authority Fee (Initial)	Total
Site Plan Control Approval (New – Standard)	$18,780.86	$10,000 (incl. HST) services >$300,000	1,040.00	**$29,820.86**

- Link to Application for Site Plan Control Approval: https://app06.ottawa.ca/online_services/forms/ds/site_plan_control_en.pdf
- Link To Relevant Policy – As part of Planning staff's review, we will evaluate your proposal against the relevant Official Plan policies. I have provided a link to it on the City's website.
    - City Official Plan: https://ottawa.ca/en/planning-development-and-construction/official-plan-and-master-plans/official-plan

Required Plans and Reports Submissions

- Attached for your information and action is a list of plans and studies required for the type of application outlined above. The required plans and studies focus on the above and other matters necessary for staff and circulated agencies to provide informed review and comment on the proposed site plan control approval application. The list is also used to deem the application complete.

Please refer to the links to Guide to preparing studies and plans and fees for further information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-application consultation comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Appendix D RVCA Preliminary Comments

File: 21-GLO-EAS-0070

September 28th, 2021

Laura Wadell, H.B.Sc., EPt
Project Manager
ECOH Management Inc.

Subject: Ministry of Infrastructure Public Works Class Environmental Assessment Proposed OCDC Parking Lot Expansion at the Ottawa-Carleton Detention Centre located at 2244 Innes Road, Ottawa, Ontario (Project 1079200 – 272455)

Dear Ms. Wadell:

The Rideau Valley Conservation Authority has completed a review of the study area and the information provided. We understand the project to be for the expansion of the parking area which will be approximately 0.95 ha in size. We offer the following comments for your consideration.

Natural Hazards

Landslide Risk/Erosion Risk

Based on the study area of the of the proposed parking area expansion, the most southerly portion of the study area is approximately between 30 and 40 metres from the top of slope of the ravine associated with Mud Creek. The relief of the slope at this location is approximately 18-19 metres in height. Several types of landslides such as simple rotational slides, retrogressive rotational slides, translational slides, and flows have been identified along Mud Creek in the document "*Geomorphic Controls on Landslide Activity in Champlain Sea Clays along Green's Creek, Eastern Ontario, Canada*" ,(Geographie physique et Quaternaire, 2004, vol. 58, No. 1, p. 9-23, 11 fig)

prepared by Chris H. Hugenholtz and Denis Lacelle, respectively: Department of Geography, University of Calgary and Department of Earth Sciences, University of Ottawa. The document identified that most of the landslides have occurred within the past 100 years with at least one landslide measuring 55 m across and 78 m in length. In 2020, the RVCA and the City of Ottawa retained a third party expert (BGC Engineering Inc.) with expertise in landslide hazard and risk assessment to assist with the evaluation of Mosquito Creek in the City's south end. As part of the supporting documentation for this study, BGC Engineering Inc. prepared a background document regarding large landslides in sensitive marine clay in the Ottawa area. The work focused on large, rapid, retrogressive earth flows and spreads, which have the potential to occur suddenly, with little to no warning, and involve large areas (hundreds of metres or greater) of relatively flat terrain above slopes. While this study is still draft, there are some preliminary findings which can be observed from the report.

Based on the historical evidence within the Ottawa area, large landslides in creek valleys have generally been observed where the relief is 9 metres or greater, with the probability of a large landslide increasing as the relief increases. However, small landslides are abundant in creek valleys in the Ottawa area. These landslides can be characterized as being tens of metres but not more than 100 metres in width and length. These landslides are generally observed along slopes with a relief of 5 metres or higher. Many pre-condition triggers of landslides have been cited in literature. Some of these include:

- Presence of normally consolidated or lightly overconsolidated soils within the slope
- Unfavorable slope geometry (high and/steep slopes, excavation at the slope toe or other steepening of the slope; presence of fill or other loads at the slope crest
- Shallow groundwater and/or unfavorable gradients; ponding of water near the slope crest
- Ongoing erosion at the toe
- Transient loads from earthquakes or human interference (construction activity)
- Rapid drawdown

Based on information from Natural Resources Canada, the Ottawa area is within the "Western Quebec Seismic Zone". Within this zone, earthquakes have been observed in two-subzones, one of them being along the Ottawa River.

https://www.seismescanada.rncan.gc.ca/zones/eastcan-en.php

Therefore, the most southerly portion of the study area may be in an area that could experience a large scale landslide or a small scale landslide. There has been no comprehensive landslide hazard or risk assessment completed for this specific area to date.

In 2009 through 2011 the NCC had commissioned J.T.B Environmental Systems Inc. to complete an integrated Fluvial Geomorphological and Hydrological Study which also included Fluvial Risk Mapping for the Green's Creek watershed which includes Mud Creek. Within the Fluvial Risk Mapping, a meander risk setback and slope stability setback were identified for Mud Creek. The meander risk was determined using components form the MNR Natural Hazards Technical Report and the TRCA Meander Belt Assessment Protocol. The slope stability setback was determined using the MNR Technical Manual for Erosion Hazards (Provincial Guidelines).

The meander risk setbacks identified on Mud Creek ranged between 33 to 69 metres. (17 to 34.5 metres from top of bank on each side). The slope stability setbacks identified on Mud Creek were far more significant than the meander risk setbacks identified. The slope stability setbacks ranged between 31 metres and 116 metres. The hazard setback is to be measured from the base of the slope. The hazard setback identified for this stretch of the creek was identified as 116m and extends into the most southernly portion of the study area. The report acknowledges that if any development was proposed within this setback that a much more detailed assessment would be required.

Since the date of the JTB Environmental System Inc. reports commissioned by the NCC, there has been significant urban development upstream of Mud Creek. The City is currently finalizing the Mud Creek Cumulative Impact Study which was prepared by Stantec Consulting Ltd. and JTB Environmental Systems Inc. The purpose of this study was to complete a cumulative impacts assessment for the upper Mud Creek for potential impacts in the foreseeable public and private developments. It was acknowledged that historically stormwater management facilities have been designed to mitigate against peak flow increases but do not address increases in runoff volumes or runoff flows which are sustained over longer periods of time and are the root of erosion problems. The report concluded that there is a potential for a significant increase in both peak discharges and runoff volumes during infrequent events in the future. When a simulation of a continuous 25-year period was completed, the potential for increases in

erosion threshold exceedance hours was approximately 40% near Renaud Road. The report has provided some recommendations which can be implemented for future development to reduce the duration of threshold exceedance hours, however, it is acknowledged that an increase will still occur. An increase in threshold exceedance hours along with any potential rapid drawdown resulting from any increase in flows are two conditions which have been cited as pre-trigger conditions for landslides.

Therefore, as the development upstream proceeds within the Mud Creek catchment area, there is a reasonable expectation that the erosion and slope stability concerns identified to date, may be exacerbated and may change the probability of a large or small landslide occurring. This should be taken into account when reviewing the proposed study area.

Stormwater Management

Given the serious concerns related to landslides, erosion, and the health of the watershed, stormwater management will play a large role in the proposed design of any parking lot expansion. Any stormwater management plan must conform to the 2003 MOE Stormwater Management Planning and Design Manual and any other relevant guiding documents that may be in place at the time of the official submission. The opportunity for LID measures should be explored for any proposed stormwater management plan. The appropriate water quality objective for this site is 'enhanced' (80% TSS Removal).

The new consolidated linear infrastructure ECA approach from the Ministry of Environment, Conservation and Parks has an implementation scheduled for 2021. Therefore, based on the projected timeframe for this project, it may form part of the City's ECA (unless exempt) for which the following criteria is noted:

- Water balance or runoff volume control to the 90th percentile
- OGS units will only address 50% treatment
- Other items identified in the new consolidated linear infrastructure ECA

The province should ensure that all of the new MECP requirements form part of the EA. The stormwater management design will also need to take into account other factors as noted above that could impact erosion and slope stability. For example, any change to stormwater discharge (to existing outlets or the creation of a new outlet) to Mud Creek must take into account the volume of water and how that may impact the geomorphological aspects of the creek downstream, and impact erosion (erosion

thresholds). Any such studies will have to consider the outcomes of any other relevant studies (slope stability, meander belt, landslide hazard and risk assessment, Mud Creek Cumulative Impact Study) and provide a comprehensive and integrated approach.

Conservation Authority Regulations

The RVCA administers Ontario Regulation 174/06 "*Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation*" made pursuant to Section 28 of the *Conservation Authorities Act*. This regulation affects the lands in question for the following:

- Any alteration, straightening, changing, diverting or interfering in any way with any watercourse requires the prior written approval from the Conservation Authority.

The Ministry of Environment, Conservation and Parks (MECP) is the parent Ministry for all Conservation Authorities. It is our intent to review any applications under Section 28 of the *Conservation Authorities Act* in accordance with the guidance documents provided by MECP. Therefore, at the time that an application is made to the Conservation Authority for any stormwater outlet or watercourse crossing, we will be reviewing the application using the most recent guidance from MECP. The City must take this into account when designing the stormwater management plan for this project.

The Conservation Authority will also require that any application demonstrate that the natural hazards are not aggravated. It is acknowledged that if the applicant is the province itself, written permission from the Conservation Authority is not required.

Conclusion

The Conservation Authority strongly recommends that prior to finalizing this EA, that the appropriate studies (geomorphological and slope stability analysis) be completed to fully understand any constraints that would impact the expansion of the parking lot. The preferred design and stormwater management approach for this site will impact the scope and level of detail required to adequately address these issues. The province may also wish to undertake a landslide hazard or risk assessment.

It is important to note that landslide hazard or risk assessment, specifically related to large landslides requires highly specialized expertise that is not commonly found locally.

There are currently no local guidelines that specifically address large landslides and associated risk tolerance. The RVCA has in the past referenced two guidelines which have been established in other jurisdictions in Canada which have been in use for some time and tested (Fraser Valley Regional District, Town of Canmore). However, threshold acceptability or risk tolerance is not a matter of technical expertise, but rather a decision that rests with those who own the risk, so any use of other jurisdictional guidelines requires due consideration for the social, economic and legal context.

If you have any questions regarding the content of this letter, please do not hesitate to contact me. Please keep us informed on the status of this EA.

Respectfully,

Jamie Batchelor, MCIP, RPP
Planner, Planning and Watershed Science
Rideau Valley Conservation Authority
613-692-3571 ext. 1191
Jamie.batchelor@rvca.ca

Cc: Glen McDonald: RVCA
NCC
Michael Boughton: City of Ottawa

Appendix E Results of Tree Inventory

Tree ID	Common Name	Taxonomic Name	Number of stems	DBH (cm)	Trunk Health	Canopy Health	Decay class	Comments	"Wildlife Tree"? (Y/N)	Fate
T 1	Basswood	*Tilia americana*	1	52	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 2	Sugar Maple	*Acer saccharum*	1	31	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	1: Healthy, live tree		Y	Retained
T 4	Basswood	*Tilia americana*	2	43	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 3	Sugar Maple	*Acer saccharum*	1	28	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 5	Basswood	*Tilia americana*	1	56	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 6	Basswood	*Tilia americana*	1	51	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 7	Silver Maple	*Acer saccharinum*	1	45	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 8	Silver Maple	*Acer saccharinum*	1	32	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 9	Silver Maple	*Acer saccharinum*	1	34	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 10	Silver Maple	*Acer saccharinum*	1	56	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 11	Silver Maple	*Acer saccharinum*	1	39	Fair: tree displays 15-40% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed
T 12	Silver Maple	*Acer saccharinum*	1	43	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed
T 13	Sugar Maple	*Acer saccharum*	1	28	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed
T 14	Sugar Maple	*Acer saccharinum*	1	56	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed
T 15	Silver Maple	*Acer saccharinum*	1	26	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained

Tree ID	Common Name	Taxonomic Name	Number of stems	DBH (cm)	Trunk Health	Canopy Health	Decay class	Comments	"Wildlife Tree"? (Y/N)	Fate
T 16	Silver Maple	*Acer saccharinum*	1	36	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 17	Silver Maple	*Acer saccharinum*	1	42	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 18	Silver Maple	*Acer saccharinum*	2	48	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 19	Silver Maple	*Acer saccharinum*	1	18	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		N	Retained
T 20	Silver Maple	*Acer saccharinum*	1	27	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 21	Silver Maple	*Acer saccharinum*	1	35	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 22	Silver Maple	*Acer saccharinum*	2	50	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 23	Silver Maple	*Acer saccharinum*	7	21	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		N	Retained
T 24	Silver Maple	*Acer saccharinum*	1	44	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 25	Silver Maple	*Acer saccharinum*	3	30	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree	1 stem dead	Y	Retained
T 26	Silver Maple	*Acer saccharinum*	1	32	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 27	Silver Maple	*Acer saccharinum*	1	32	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 28	Silver Maple	*Acer saccharinum*	1	43	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 29	Silver Maple	*Acer saccharinum*	1	41	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 30	Silver Maple	*Acer saccharinum*	1	42	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained

Tree ID	Common Name	Taxonomic Name	Number of stems	DBH (cm)	Trunk Health	Canopy Health	Decay class	Comments	"Wildlife Tree"? (Y/N)	Fate
T 31	Silver Maple	*Acer saccharinum*	1	38	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 32	Silver Maple	*Acer saccharinum*	1	37	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 33	Silver Maple	*Acer saccharinum*	1	33	Good: tree displays less than 15% deficiency/defect	Poor: tree displays greater than 40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 34	Basswood	*Tilia americana*	4	47	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 35	Basswood	*Tilia americana*	2	36	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed
T 36	Basswood	*Tilia americana*	1	32	Poor: tree displays greater than 40% deficiency/defect	Poor: tree displays greater than 40% deficiency/defect	4: Recently dead, bark peeling, only large branches intact		N	Retained
T 37	Trembling Aspen	*Populus tremuloides*	1	74	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 38	Trembling Aspen	*Populus tremuloides*	1	38	Poor: tree displays greater than 40% deficiency/defect	Poor: tree displays greater than 40% deficiency/defect	4: Recently dead, bark peeling, only large branches intact		N	Retained
T 39	Basswood	*Tilia americana*	5	41	Poor: tree displays greater than 40% deficiency/defect	Poor: tree displays greater than 40% deficiency/defect	5: Older dead tree, 90% bark lost, few branch stubs, broken top		N	Retained
T 40	Trembling Aspen	*Populus tremuloides*	3	41	Fair: tree displays 15-40% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost	1 stem dead	Y	Retained
T 41	Trembling Aspen	*Populus tremuloides*	1	18	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		N	Retained
T 42	Trembling Aspen	*Populus tremuloides*	1	16	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		N	Retained
T 43	Honey Locust	*Gleditsia triacanthos*	2	22	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		N	Retained
T 44	American Elm	*Ulmus americana*	1	25	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		N	Retained
T 45	White Spruce	*Picea glauca*	1	55	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed

Tree ID	Common Name	Taxonomic Name	Number of stems	DBH (cm)	Trunk Health	Canopy Health	Decay class	Comments	"Wildlife Tree"? (Y/N)	Fate
T 47	Basswood	*Tilia americana*	2	27	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Removed
T 46	Basswood	*Tilia americana*	1	56	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Removed
T 48	Basswood	*Tilia americana*	1	41	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Removed
T 49	Basswood	*Tilia americana*	1	34	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Removed
T 50	White Oak	*Quercus alba*	1	52	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Removed
T 51	Basswood	*Tilia americana*	1	37	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed
T 53	Basswood	*Tilia americana*	1	33	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Removed
T 52	Basswood	*Tilia americana*	1	47	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	1: Healthy, live tree		Y	Removed
T 55	Basswood	*Tilia americana*	2	28	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed
T 54	Basswood	*Tilia americana*	1	45	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Removed
T 56	Silver Maple	*Acer saccharinum*	1	47	Good: tree displays less than 15% deficiency/defect	Poor: tree displays greater than 40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 57	Trembling Aspen	*Populus tremuloides*	1	22	Good: tree displays less than 15% deficiency/defect	Poor: tree displays greater than 40% deficiency/defect	2: Declining live tree, part of canopy lost		N	Retained
T 58	Trembling Aspen	*Populus tremuloides*	1	20	Poor: tree displays greater than 40% deficiency/defect	Poor: tree displays greater than 40% deficiency/defect	4: Recently dead, bark peeling, only large branches intact		N	Retained
T 59	Weeping Willow	*Salix babylonica*	1	74	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	1: Healthy, live tree		Y	Retained
T 60	Green Ash	*Fraxinus americana*	2	17	Poor: tree displays greater than 40% deficiency/defect	Poor: tree displays greater than 40% deficiency/defect	5: Older dead tree, 90% bark lost, few branch stubs, broken top		N	Retained

Tree ID	Common Name	Taxonomic Name	Number of stems	DBH (cm)	Trunk Health	Canopy Health	Decay class	Comments	"Wildlife Tree"? (Y/N)	Fate
T 61	Silver Maple	*Acer saccharinum*	1	42	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 62	Sugar Maple	*Acer saccharum*	1	24	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		N	Retained
T 63	Silver Maple	*Acer saccharinum*	1	30	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 66	Silver Maple	*Acer saccharinum*	1	32	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 64	Silver Maple	*Acer saccharinum*	1	32	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		Y	Retained
T 65	Trembling Aspen	*Populus tremuloides*	1	13	Good: tree displays less than 15% deficiency/defect	Good: tree displays less than 15% deficiency/defect	1: Healthy, live tree		N	Retained
T 67	Silver Maple	*Acer saccharinum*	1	33	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 68	Silver Maple	*Acer saccharinum*	1	40	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Retained
T 69	Red Maple	*Acer rubrum*	1	21	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		N	Retained
T 70	Silver Maple	*Acer saccharinum*	1	32	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	2: Declining live tree, part of canopy lost		Y	Removed
T 71	Silver Maple	*Acer saccharinum*	1	41	Good: tree displays less than 15% deficiency/defect	Fair: tree displays 15-40% deficiency/defect	1: Healthy, live tree		Y	Retained

Appendix F Wetland Functions Assessment

Appendix A

Information that should be included in an assessment of wetland functions. Adapted from Wisconsin Rapid Assessment Methodology.

GENERAL INFORMATION

Project Name: Parking Lot Expansion at the Ottawa-Carleton Detention Centre (2244 Innes Rd, Ottawa)

Project Proponent: Infrastructure Ontario

Evaluator(s), Affiliation and Contact Information: Katie Black, Kilgour & Associates Ltd.

Date(s) and Duration of Site Visit(s): June 23 & July 9, 2021

Description of seasonal limitations of inspection: Did not capture spring freshet.
(*e.g.*, hydrologic and climatologic conditions, after heavy rains, presence of snow or ice cover, during drought year, during spring flood, during bird migration, before/after growing season)

Detailed Wetland Functions Assessment Method(s) Used and Why: This appendix per NCC recommendation/request. Wetland also classified via ELC for southern ON.

Name of Wetland: N/A

Owners:
Is any part of the wetland in public, Aboriginal or conservation ownership? If so name: No. Owned by NCC (federal entity), private.

Location: County, ¼ Section, Township, Parish, Range.
Property Identification Data
Geographic Coordinates
National Topographic Series 1:50,000 Map Sheet
Wetland Identifier, Wetland Map Sheet
Air Photo Number and Year (Attached)
} See EIA report.

Is the wetland part of a monitoring or research project where relevant data exists? No

WETLAND DESCRIPTION

Wetlands Class based on Published Inventory: Canadian Wetland Classification System.
Based on various inventory sources such as national (Canadian Wetland inventory), regional (Maritime Wetland Inventory), provincial (Prince Edward Island), municipal (Saint John): Marsh → Marsh → Isolated basin marsh

Wetland Class (subclasses, types) based on Field Work:
Based on Canadian Wetland Classification System and/or regional, provincial or territorial classification system: as above. → Graminoid From Ontario ELC: Cattail Mineral Shallow Marsh Type.

Size of wetland: 0.11 ha

To nearest 0.1 ha as reported in wetland inventory and/or estimated using aerial photographs, and/or delineated in the field.

SITE DESCRIPTION

I. HYDROLOGIC SETTING

A. Describe the geomorphology of the wetland:
- Depressional (includes slopes, potholes, small lakes, kettles, etc.)
- Riverine
- Lake Fringe
- Extensive Peatland
- Coastal Marine
- Other
- Extensive Peatland

B. (Y) N Has the wetland hydrology been altered by ditching, tiles, dams, culverts, well pumping, diversion of surface flow, dikes, water control structures, beaver activity, industrial effluent additions or changes to runoff within the watershed? Circle those that apply and provide narrative details. Feature was dug as duck pond in the 1970s; water was held via a dike which was released in the early 2000s, resulting in current wetland conditions.

C. (Y) N Does the wetland have an inlet, outlet, or both (circle those that apply)? Include these features on site map. Outlet drains into swale within hedgerow along NW property line. Swale drains into roadside ditch.

D. (Y) N Is there any field evidence of wetland hydrology such as buttressed tree trunks, adventitious roots, drift lines, water marks, water stained leaves, soil mottling/reduced matrix, organic soils layer, or oxidized rhizospheres (circle those that apply)? Gley

E. Y (N) Does the wetland have standing water, and if so what is the approximate depth (cm)? N/A
Provide a map / GPS coordinates of where water depth measurements were recorded. N/A
Approximately how much of the wetland has surface water (*e.g.*, percentage) 0%.

F. How is the hydroperiod (seasonal water level pattern) of the wetland classified?
- Permanently Flooded
- Seasonally Flooded (*e.g.*, spring freshet, snowmelt,) → assumed to be flooded in the spring
- Ephemeral Vernal Pools, Sheetwater
- Saturated Soils (surface water seldom present) → this was observed at time of field studies in June/July.
- Tidal
- Artificially Flooded → From snow management
- Artificially Drained

G. Y (N) Is the wetland a navigable body of water or is a portion of the wetland below the ordinary highwater mark of a navigable water body?

Identify and list any surface waters associated with the wetland or in proximity to the wetland (note approximate distance from the wetland and navigability determination). Not hydrologically connected to navigable waters
Mud Creek is ~193 m to the south.
Note if there is a surface water connection to other wetlands. No.

II. VEGETATION

A. Identify the vegetation communities present. Identify dominant plant species. Attach a list of plant species present. If applicable identify wetland indicator status of each plant species.
↳ See EIA report

1. Floating leaved community dominated by:
2. Submerged aquatic community dominated by:
3. Emergent community dominated by: Phragmites australis & Typha latifolia.
4. Shrub community dominated by:
5. Deciduous broad-leaved tree community dominated by:
6. Coniferous tree community dominated by:
7. Open sphagnum mat or bog:
8. Sedge meadow / wet prairie community dominated by:
9. Other (explain):

B. List other plant species identified during site visit: See EIA report.

C. Identify any plant 'species or communities of special status' that have the potential to occur on or near the site, and identify the source of this listing and information:
Quercus alba (regionally significant) & Gleditsia triacanthos (rare) per Muncaster & Brunton (2005)

D. Identify any plant 'species or communities of special status' that were observed in the field:
As above → occur in upland habitat, not in wetland.

III. SOILS

A. Identify Federal or Provincial soil map used, soil association or soil series: Marshall et al (1979): Manotick Association soils

B. Field description:
Identify and describe soil sampling locations. Indicate dominant surface vegetation and landscape position at each location. Attach site maps showing sampling locations and GPS coordinates.

1. Organic soil? (Y) N
2. Indicate depth of organic layer (cm): ~40cm
3. von Post scale: Surface layers contain distinct plant remains followed by completely decomposed peat (H1 to H10).
4. Indicate: Fibrisol / Mesisol / Humisol No middle tier for organic soil
5. Marl present? Y (N)
6. Mineral soil present ? (Y) N
7. Circle all those present: mottles, reduced matrix, iron / manganese concretions, organic streaking (gley)
8. Depth of mottling within mineral surface if present (cm): ~20cm
9. Munsell color of matrix and mottles: Rusty red
10. Depth of reduced matrix within mineral surface if present (cm): ~20cm
11. Munsell color of reduced matrix: Rusty red.
12. Depth of A Horizon: ~20cm
13. Soil classification according to the Canadian System of Soil Classification (indicate Soil Order, Soil, Great Group, Soil Subgroup):

Soils sampled at:
18T 454558 5030266 → Phragmites; depression (within wetland)
18T 454587 5030236 → Typha; depression (within wetland).

IV. ANTHROPOGENIC IMPACTS ON WETLAND

A. Is the wetland itself relatively free of obvious human influences (current and historical), such as:

1. Y N Buildings?
2. Y (N) Roads?
3. Y (N) Other structures?
4. Y (N) Trash?
5. Y N Pollution?
6. Y (N) Filling?
7. Y (N) Dredging/draining?
8. Y (N) Domination by non-native vegetation?
9. Y N Farming and Agriculture?
10. Y N Forestry?
11. Y N Mining / Resource Extraction?

Not free of the circled items.
? parking lot.
Gravel pushed in from snow plow.
Former dike; culvert still in place.

V. SURROUNDING LAND USES AND VEGETATIVE COMMUNITIES

A. What is the estimated area of the wetland catchment (watershed) in ha? 0.7 ha.
(but note that catchment includes OCDC facility which likely alters the catchment via SWM.

B. In measured area (ha) or estimated as percentage of catchment (watershed) provide detail and describe the surrounding land uses, such as:

1. Developed (Industrial/Commercial/Residential) OCDC facility → >85%.
2. Agricultural/cropland
3. Agricultural/grazing
4. Forested
5. Grassland
6. Grassed recreation areas/parks
7. Old field
8. Oil and gas
9. Highways or roads
10. Other (specify) N/A - not regulated by RVCA.

Remaining <15% is wetland itself

C. Describe the regulated buffer area (if applicable) immediately adjacent to the wetland (*e.g.*, disturbance, vegetation, erosion): Buffer is disturbed → see EIA report for details.

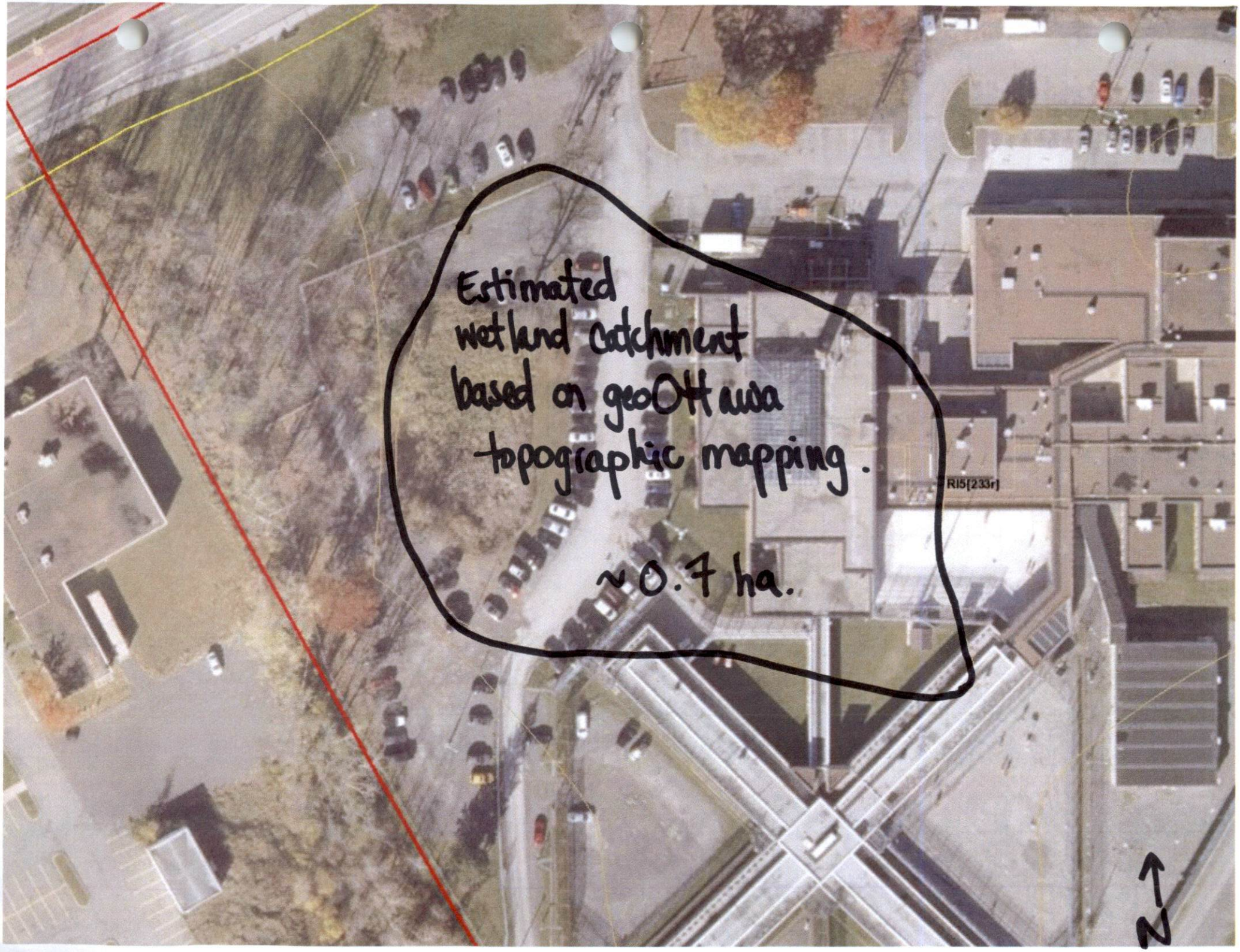
VI. SITE MAPS

See EIA report. Catchment map is attached.

A. If applicable attach the wetland delineation report including dates and delineator name(s) as per jurisdictional standards.

B. Provide information on wetland location in watershed, surrounding land use, special features at 1:50,000 scale.

C. Provide wetland map using several maps and/or different data layers if necessary. Map to scale, using GIS or hand drawn. Also include file with GPS coordinates of data.


Estimated
wetland catchment
based on geoOtt aus
topographic mapping.
~0.7 ha.
RI5[233r]
N

Include on Map:

1. All sampling locations
2. Location of permanent photo stations
3. Spatial extent of this assessment
4. Project footprint and impact locations
5. Property boundaries
6. Wetland boundary
7. Inflow(s) /outflow(s)
8. Depth to water table (if available)
9. Vegetative communities
10. Wetland subclasses
11. Legend with north arrow, scale, etc

} See EIA report.

VII. FIELD BASED OBLIQUE PHOTOS

Provide digital photos with GPS coordinates and direction of photos and date See EIA report

VIII. WETLAND FUNCTIONS PRESENT

The following requires the assessor to examine site conditions that provide evidence that a given function or value is present/absent and to assess the significance of the wetland to perform those functions. Narrative and quantitative justifications should be provided as appropriate. Positive answers to questions indicate the presence of factors important for the function. The questions are not definitive or all-inclusive, and are only provided to guide the assessment.

A) Special Features and "Red Flags"

1). Is the wetland in or adjacent to an area of special natural resource interest?
Answer "YES" or ("NO") For all "YES" answers provide details.
Examples:

- Salmonid streams, their tributaries, and lakes (cold water communities)
- Provincial, territorial, or federal designated wild and scenic rivers
- Designated riverway
- Designated scenic urban waterway
- Environmentally sensitive area or environmental corridor identified in an area-wide water quality management plan, special area management plan, special wetland inventory study, or an advanced delineation and identification study. Located 7120m from Green's Creek ANSI.
- Calcareous fen
- Park, forest, trail or recreation area
- Fish and wildlife refuges and fish and wildlife management areas
- Designated wilderness area
- Designated wetland (*e.g.*, Ramsar, WHSRN)
- Wilderness area
- Lands acquired for wildlife conservation (*e.g.*, North American Waterfowl Management Plan)
- Designated or dedicated natural area, (*e.g.*, NB Protected Natural Area)
- Surface water/Ground water identified or designated as an important source of water

2). Y (N) According to the Conservation Data Centre, federal / provincial / territorial data and expertise, local Environmental Non-Government Agencies, naturalists or direct observations, are there any rare, endangered, threatened, or special concern species in, near, or using the wetland or adjacent lands? If so, list the species of concern. SAR records within the vicinity (see EIA report) are likely associated with Green's Creek PNSI.

B) Vegetation Diversity

1. Y (N) Does the wetland support a variety of native plant species or is it dominated by a limited number of species? Y to the latter.

2. Y (N) **Unknown** Is the wetland plant community regionally scarce or rare?

3. (Y) N Are there exotic species present (*e.g.*, reed canary grass, flowering rush, buckthorn, purple loosestrife)? Provide location (GPS or map) and amount (*e.g.*, number of plants or m^2). See EIA report.

C) Wildlife and Fish Habitat

1. List species of fish and wildlife observed, evidenced, or expected, to utilize the wetland: Red-winged Blackbird observed nesting in Typha in wetland.

2. Y (N) Does the wetland contain a number of major vegetative cover types? If so, is there a high degree of interspersion of those vegetation types? **Y N**

3. Y (N) Is the estimated ratio of open water to vegetative cover between 30 and 70 %? What is the estimated percentage? 0% open water

4. Y (N) **Unknown** Does the surrounding upland habitat support a variety of wildlife species?

5. Y (N) Is the wetland part of or associated with a wildlife corridor or designated environmental corridor?

6. Y (N) Is the surrounding habitat and/or the wetland itself a large tract of undeveloped land important for wildlife that require large home ranges (*e.g.*, bear, woodland passerines)?

7. Y (N) Is the surrounding habitat and/or the wetland itself a relatively large tract of undeveloped land within an urbanized environment that is important for wildlife?

8. Y (N) Are there other wetland areas near the subject wetland that may be important to wildlife?

9. Y (N) Is the wetland contiguous with a permanent waterbody or periodically inundated for sufficient periods of time to provide spawning/nursery habitat for fish?

10. Y (N) Can the wetland provide significant food base for fish and wildlife (*e.g.*, insects, crustaceans, voles, forage fish, amphibians, reptiles, shrews, wild rice, wild celery, duckweed, pondweeds, watermeal, bulrushes, bur reeds, arrowhead, smartweeds, millets)?

11. Y (N) Is the wetland in or near any urban centers?

12. Y (N) Is the wetland located in a priority watershed/township as identified in Habitat Joint Ventures Plans of the North American Waterfowl Management Plan or Bird Conservation Region Plans?

13. Y (N) Is the wetland providing habitat that is scarce to the region?

D) Flood and Stormwater Storage/Attenuation

1. Y (N) Are there steep slopes, large impervious areas, moderate slopes with row cropping, or areas with severe overgrazing within the watershed (circle those that apply)? Steep slopes associated with Mud Creek >120m away (adjacent catchment).

2. Y (N) Does the wetland significantly reduce run-off velocity due to its size, configuration, braided flow patterns, or vegetation type and density?

3. Y (N) Does the wetland show evidence of flashy water level responses to storm events (*e.g.*, debris marks, erosion lines, stormwater inputs, channelized inflow)?

4. Y (N) Is there a natural feature or human-made structure impeding drainage from the wetland that causes backwater conditions? → Previously, yes (dike).

5. (Y) N Considering the size of the wetland area in relation to the size of its watershed, at any time during the year is water likely to reach the wetland's storage capacity (i.e., the level of easily observable wetland vegetation)? In cases where greater documentation is required, one should determine the wetland's capacity to hold 25% of the run-off from a 1 in 100 year, 24 hour storm event. → potentially during spring freshet since snow is placed in wetland (artificial capacity).

6. Y (N) Considering the location of the wetland in relation to the associated surface water watershed, is the wetland important for attenuating or storing flood, or stormwater peaks, or spring snowmelt events (i.e., is the wetland located in the mid or lower reaches of the watershed)? → artificially, yes, from snow management.

E) Water Quality Protection

1. Y (N) Does the wetland receive overland flow or direct discharge of stormwater as a primary source of water (circle that which applies)? → Likely receives most water from snowmelt & precipitation. Some run-off from parking lot may be directed to wetland.

2. (Y) N Do the surrounding land uses have the potential to deliver significant nutrient and/or sediment loads to the wetland?

3. Y (N) Based on the answers to the flood/stormwater section above, does the wetland perform significant flood/stormwater attenuation (residence time to allow settling)? If yes, more quantitative details are required.

4. (Y) N Does the wetland have significant vegetative density to decrease water energy and allow settling of suspended materials?

5. Y (N) Is the position of the wetland in the landscape such that run-off is held or filtered before entering a surface water? Drains to swale, then storm sewer.

6. Y (N) Are algal blooms, extensive macrophyte growth, or other signs of excess nutrient loading to the wetland apparent (or historically reported)?

F) Shoreline Protection

1. Y (N) Is the wetland in a lake fringe, riverine or coastal setting?

If YES to above question, then answer the following questions.

2. Y N Is the shoreline exposed to constant wave action caused by long wind fetch or boat traffic?

3. Y N Is the shoreline and shallow littoral zone vegetated with submerged or emergent vegetation in the swash zone that decrease wave energy or perennial wetland species that form dense root mats and/or species that have strong stems that are resistant to erosive forces?

4. Y N Is the stream bank prone to erosion due to unstable soils, land uses, or ice floes?

5. Y N Is the stream bank vegetated with densely rooted shrubs that provide upper bank stability?

G) Groundwater Recharge and Discharge

1. Y (N) Related to discharge, are there observable (or reported) springs located in the wetland, physical indicators of springs such as marl soil, or vegetation indicators such as watercress or marsh marigold present that tend to indicate the presence of groundwater springs?

2. Y (N) Related to discharge, may the wetland contribute to the maintenance of base flow in a stream?

3. Y (N) Related to recharge, is the wetland located on or near a groundwater divide (*e.g.* an elevational highpoint)?

Appendix G Regional Species at Risk Screening

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
Birds						
Bald Eagle (*Haliaeetus leucocephalus*)	**Special Concern**	**Not at Risk**	Cornell Lab of Ornithology, 2021	Nest in mature forests near open water. In large trees such as pine and poplar.	The Site does not appear to contain suitable habitat.	Low
Bank Swallow (*Riparia riparia*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009; Cornell Lab of Ornithology, 2021	Colonial nester; burrows in eroding silt or sand banks, sand pit walls, and human-made sand piles. Often found on banks of rivers and lakes.	The Site does not appear to contain suitable habitat.	Low
Barn Swallow (*Hirundo rustica*)	**Special Concern**	**Threatened**	Bird Studies Canada et al., 2009; Cornell lab of Ornithology, 2021; MNDMNRF, 2021; MNDMNRF, 2021b	Nests on barns and other structures. Forages in open areas for flying insects. Lives in close association with humans and prefers to nest on structures such as open barns, under bridges, and in culverts.	Structures on and adjacent to the Site may provide suitable habitat.	Moderate
Black Tern (*Chlidonias niger*)	**Special Concern**	**No Status**	n/a	Build floating nests in loose colonies in shallow marshes, especially in cattails.	The Site does not appear to contain suitable habitat.	Negligible
Bobolink (*Dolichonyx oryzivorus*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009; Cornell lab of Ornithology, 2021; Government of Canada, 2021; MNDMNRF, 2021a	Periodically mown, dry meadow for nesting. Habitat (meadow) should be >10 ha, and preferably >30 ha before Bobolink are attracted to the area. Not near tall trees.	The Site does not appear to contain suitable habitat.	Low
Canada Warbler (*Cardellina canadensis*)	**Special Concern**	**Threatened**	Bird Studies Canada et al., 2009; Cornell Lab of Ornithology, 2021; MNDMNRF, 2021a	Prefers wet forests with dense shrub layers. Nests located on or near the ground on mossy logs or roots, along stream banks or on hummocks.	The Site does not appear to contain suitable habitat.	Low
Cerulean Warbler (*Setophaga cerulea)*	**Threatened**	**Threatened**	n/a	Prefers mature deciduous forests.	The Site does not appear to contain suitable habitat.	Negligible

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
Chimney Swift (*Chaetura pelagica*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009	Nests in traditional-style open brick chimneys (and rarely in hollow trees). Tends to stay close to water.	The Site does not appear to contain suitable habitat.	Low
Common Nighthawk (*Chordeiles minor*)	**Special Concern**	**Threatened**	Bird Studies Canada et al., 2009	Nests in a wide variety of open sites, including beaches, fields, and gravel rooftops with little to no ground vegetation. They also nest in cultivated fields, orchards, urban parks, mine tailings and along gravel roads/railways but tend to occupy more natural sites.	Open areas on-Site may provide suitable nesting habitat. The parking lot expansion area does not contain suitable habitat.	Low
Eastern Meadowlark (*Sturnella magna*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009; Cornell lab of Ornithology, 2021; MNDMNRF, 2021a	Periodically mown, dry meadow for nesting. Habitat (meadow) should be >10 ha, and preferably >30 ha before Eastern Meadowlark are attracted to the area. Not near tall trees.	The Site does not appear to contain suitable habitat.	Low
Eastern Whip-poor-will (*Antrostomus vociferus*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009	Suitable breeding habitats generally include open and half treed areas and often exhibit a scattered distribution of treed and open space. Lays eggs directly on the forest floor. Roosts are typically located in forest habitat on a low branch or directly on the ground.	The Site does not appear to contain suitable habitat,	Low
Eastern Wood-pewee (*Contopus virens*)	**Special Concern**	**Special Concern**	Bird Studies Canada et al., 2009; Cornell Lab of Ornithology, 2021;MNDMNRF, 2021a	Woodland species often found in the mid-canopy layer near clearings and edges of deciduous and mixed forests.	The Site does not appear to contain suitable habitat.	Low
Evening Grosbeak (*Coccothraustes vespertinus*)	**Special Concern**	**Special Concern**	n/a	Nests in trees or large shrubs; prefers mature coniferous forests but will also use deciduous forests, parklands, and orchards.	The Site does not appear to contain suitable habitat.	Negligible
Golden Eagle	**Endangered**	**No Status**	n/a	Nests in remote, undisturbed areas, usually building their nests on ledges	The Site does not appear to contain suitable habitat.	Negligible

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
(*Aquila chrysaetos*)				on a steep cliff/riverbank or large trees if needed. Most hunting is done near open areas such as large bogs or tundra.		
Golden-winged Warbler (*Vermivora chrysoptera*)	**Special Concern**	**Threatened**	n/a	Ground-nests in areas of young shrubs surrounded by mature forest. Often found in areas that have recently been disturbed such as field edges, hydro or utility right-of-ways, or logged areas.	The Site does not appear to contain suitable habitat.	Negligible
Grasshopper Sparrow (*Ammodramus savannarum*)	**Special Concern**	**Special Concern**	n/a	Lives in open grassland areas with well-drained sandy soil. Will also nest in hayfields and pastures, as well as alvars, prairies, and occasionally grain crops such as barley. It prefers areas that are sparsely vegetated, and its nests are well hidden in the field, woven from grasses in a small cup-like shape.	The Site does not appear to contain suitable habitat.	Negligible
Henslow's Sparrow (*Ammodramus henslowii*)	**Endangered**	**Endangered**	n/a	Prefers extensive, dense, tall grasslands where it can easily conceal its small ground nest. Tends to avoid fields that have been grazed or are crowded with trees and shrubs.	The Site does not appear to contain suitable habitat.	Negligible
Horned Grebe (*Podiceps auritus*)	**Special Concern**	**No Status**	n/a	Nest in small ponds, marshes, and shallow bays that contain areas of open water and emergent vegetation.	The Site does not appear to contain suitable habitat.	Negligible
Least Bittern (*Ixobrychus exilis*)	**Threatened**	**Threatened**	Bird Studies Canada et al., 2009; MNDMNRF, 2021a; MNDMNRF, 2021b	Found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels.	The Site does not appear to contain suitable habitat.	Low
Loggerhead Shrike (*Lanius ludovicianus*)	**Endangered**	**Endangered**	MNDMNRF, 2021a	Prefers pasture or other grasslands with scattered low trees and shrubs. Lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey.	The Site does not appear to contain suitable habitat.	Low
Olive-sided Flycatcher (*Contopus cooperi*)	**Special Concern**	**Threatened**	Cornell lab of Ornithology, 2021	Found along natural forest edges and openings. Will use forests that have been logged or burned if there are ample tall snags and trees to use for foraging perches.	The Site does not appear to contain suitable habitat.	Low

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
Peregrine Falcon (*Falco peregrinus*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology, 2021	Nests on tall, steep cliff ledges close to large bodies of water. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas.	The Site does not appear to contain suitable habitat.	Low
Red Knot (*Calidris canutus rufa*)	**Endangered**	**Endangered**	n/a	Prefer open beaches, mudflats, and coastal lagoons where they feast on molluscs, crustaceans, and other invertebrates.	The Site does not appear to contain suitable habitat.	Negligible
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	**Special Concern**	**Threatened**	MNDMNRF, 2021a	Lives in open woodland and woodland edges and is often found in parks, golf courses, and cemeteries. These areas typically have many dead trees, which the birds use for nesting and perching.	Open/edge habitats along the deciduous hedgerow on-Site may provide suitable habitat. Wooded areas adjacent to the Site are expected to provide more optimal habitat.	Moderate
Rusty Blackbird (*Euphagus carolinus*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology, 2021	Prefers wet wooded or shrubby areas. Nests at edges of boreal wetlands and coniferous forests. These areas include bogs, marshes, and beaver ponds.	The Site does not appear to contain suitable habitat.	Low
Short-eared Owl (*Asio flammeus*)	**Special Concern**	**Special Concern**	n/a	Lives in open areas such as grasslands, marshes, and tundra where it nests on the ground and hunts for small mammals.	The Site does not appear to contain suitable habitat.	Negligible
Wood Thrush (*Hylocichla mustelina*)	**Special Concern**	**Threatened**	Bird Studies Canada et al., 2009; Cornell Lab of Ornithology, 2021; MNDMNRF, 2021a	Lives in mature deciduous and mixed (conifer-deciduous) forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing and perching. Usually build nests in Sugar Maple or American Beech.	The Site does not appear to contain suitable habitat.	Low
Yellow Rail (*Coturnicops noveboracensis*)	**Special Concern**	**Special Concern**	n/a	Lives deep in the reeds, sedges, and marshes of shallow wetlands, where they nest on the ground. The marshy areas used by Yellow Rails have an overlying dry mat of dead vegetation that is used to make roofs for nests.	The Site does not appear to contain suitable habitat.	Low
Mammals						
Algonquin Wolf (*Canis* sp.)	**Threatened**	**Special Concern**	n/a	Not restricted to a specific habitat type but typically occurs in deciduous and mixed forest landscapes.	This species only occurs in Algonquin Provincial Park and surrounding townships, along with other areas in central	None.

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					Ontario including in and around Killarney Provincial Park, Kawartha Highlands Signature Site, and Queen Elizabeth II Wildlands (MECP, 2019a).	
Eastern Cougar (*Puma concolor*)	**Endangered**	**No Status**	n/a	Lives in large, undisturbed forests or other natural areas where there is little human activity.	The Site does not appear to contain suitable habitat.	Negligible
Eastern Small-footed Myotis (*Myotis leibii*)	**Endangered**	**Not Listed**	MECP (pers. comm.)	In the spring and summer, Eastern Small-footed Myotis will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. Overwinters in caves and abandoned mines.	The Site does not appear to contain suitable habitat.	Low
Gray Fox (*Urocyon cinereoargenteus*)	**Threatened**	**Threatened**	n/a	Lives in deciduous forests and marshes. Their dens are usually found in dense shrubs close to a water source, but they will also use rocky areas, hollow trees, and underground burrows dug by other animals.	The range of this species has recently been reduced to west of Lake Superior in the Rainy River District and on Pelee Island in west Lake Eerie (MECP, 2020a).	None
Little Brown Myotis (*Myotis lucifugus*)	**Endangered**	**Endangered**	Humphrey and Fotherby, 2019	During the day they roost in trees and buildings. They often select attics, abandoned buildings, and barns for summer colonies where they can raise their young. They can squeeze through very tiny spaces (as small as six millimetres across) allowing them access to many different roosting areas.	Buildings and limited tree cover on-Site may provide roosting habitat. Open areas on-Site (e.g., lawn) may be used for foraging if roosting nearby. However, the Mud Creek corridor south of the Site and nearby wooded areas would provide more optimal habitat.	Moderate
Northern Myotis / Northern Long-eared Bat (*Myotis septentrionalis*)	**Endangered**	**Endangered**	MECP (pers. comm.)	Associated with boreal forests, choosing to roost under loose bark and in the cavities of trees.	Buildings and limited tree cover on-Site may provide roosting habitat. Open areas on-Site (e.g., lawn) may be used for foraging if roosting nearby. However, the Mud Creek corridor south of the Site and nearby wooded areas would provide more optimal habitat.	Moderate

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Tri-coloured Bat / Eastern Pipistrelle (*Perimyotis subflavus*)	**Endangered**	**Endangered**	Humphrey and Fotherby, 2019	Roosts mainly in trees during summer; overwinters in caves and mines along with other species, but often uses deeper parts of the hibernaculum.	Buildings and limited tree cover on-Site may provide roosting habitat. Open areas on-Site (e.g., lawn) may be used for foraging if roosting nearby. However, the Mud Creek corridor south of the Site and nearby wooded areas would provide more optimal habitat.	Moderate
Amphibians						
Western Chorus Frog (*Pseudacris triseriata*)	**No Status**	Great Lakes-St. Lawrence population: **Threatened**	n/a	Inhabits forest openings around woodland ponds but can also be found in or near damp meadows, marshes, bottomland swamps, and temporary ponds in open country, or even urban areas.	Small wet depression within the proposed parking lot expansion area on-Site may provide suitable breeding habitat.	Low
Arthropods						
Bogbean Buckmoth (*Hemileuca* sp. 1)	**Endangered**	**Endangered**	n/a	Restricted to open, chalky, low shrub fens containing large amounts of bogbean, an emergent wetland flowering plant.	The Site does not appear to contain suitable habitat	Negligible
Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*)	**Endangered**	**Endangered**	n/a	Live in diverse habitats including open meadows, mixed farmlands, urban areas, boreal forest, and montane meadows. Host nests occur in abandoned underground rodent burrows and rotten logs.	Currently only known to occur in Pinery Provincial Park (MECP, 2019b).	None.
Macropis Cuckoo Bee *(Epeoloides pilosulus)*	**Not listed**	**Endangered**	n/a	Found in habitats supporting both Macropis bees and their food plant, Yellow Loosestrife (*Lysimachi*a).	Has not been observed in Ontario in over 45 years (COSEWIC, 2011).	None.
Monarch (*Danaus plexippus*)	**Special Concern**	**Special Concern**	California Academy of Sciences and National Geographic Society, 2021	Milkweeds are the sole food plant for Monarch caterpillars. These plants predominantly grow in open and periodically disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests.	Open and disturbed areas on-Site may provide suitable foraging habitat. However, milkweed was not observed in the proposed parking lot expansion area, and this area lacks nectar plants given the presence of the existing parking lot.	Low

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Mottled Duskywing (*Erynnis martialis*)	**Endangered**	**No Status**	n/a	Requires host plants such as the New Jersey Tea and Prairie Redroot. These plants grow in dry, well-drained soils or alvar habitat within oak woodland, pine woodland, roadsides, riverbanks, shady hillsides, and tall grass prairies.	The Site does not appear to contain suitable habitat.	Negligible
Nine-spotted Lady Beetle (*Coccinella novemnotata*)	**Endangered**	**No Status**	n/a	Occurs within agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, riparian areas, and isolated natural areas.	There have been no records of this species in Ontario since the mid-1990s (MECP, 2019c).	None.
Rapids Clubtail *(Gomphus quadricolor)*	**Endangered**	**Endangered**	n/a	Inhabits a wide variety of riverine habitats ranging in size from the St. Lawrence River to small creeks. Larvae are typically found in microhabitats with slow to moderate flow and fine sand or silt substrates where they burrow into the stream bed. Adults disperse from the river after emerging and feed in the forest canopy and other riparian vegetation.	There are no records of this species in Ottawa (MECP, 2019d).	None.
Rusty-patched Bumble Bee (*Bombus affinis*)	**Endangered**	**Endangered**	n/a	Can be found in open habitat such as mixed farmland, urban settings, savannah, open woods, and sand dunes.	The range of this species is limited to southwestern Ontario (MECP, 2019e).	None.
Transverse Lady Beetle (*Coccinella transversoguttata*)	**Endangered**	**Special Concern**	MNDMNRF, 2021a	Able to live in a wide range of habitats, including agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, and riparian areas.	There have been no records of the species in Ontario since 1990 (MECP, 2020b).	None.
West Virginia White butterfly (*Pieris virginiensis*)	**Special Concern**	**No Status**	n/a	Lives in moist, deciduous woodlots. Requires a supply of toothwort, a small, spring-blooming plant that is a member of the mustard family, since it is the only food source for larvae.	The Site does not appear to contain suitable habitat.	Negligible

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Yellow-banded Bumble Bee (*Bombus terricola*)	**Special Concern**	**Special Concern**	n/a	This species is a forage habitat generalist, able to use a variety of nectaring plants and environmental conditions. Can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands, and urban areas.	Open areas and hedgerow on-Site may provide suitable habitat.	Low
Lichens						
Black-foam Lichen (*Anzia colpodes*)	**No Status**	**Threatened**	n/a	Grows on the trunks of mature deciduous trees growing on level or sloped land where high humidity is supplied by nearby wetlands, lakes, or streams. The most common host is Red Maple but it also occurs on White Ash, Sugar Maple, Red Oak, and very occasionally on other species.	Assumed to no longer occur in Ontario (COSEWIC, 2015).	None.
Flooded Jellyskin (*Leptogium rivulare*)	**No Status**	**Threatened**	n/a	Grows in seasonally flooded habitats, typically on the bark of deciduous trees, on rocks along the margins of seasonal ponds, and on rocks along shorelines and stream/riverbeds.	The Site does not appear to contain suitable habitat.	Negligible
Pale-bellied Frost Lichen (*Physconia subpallida*)	**Endangered**	**Endangered**	n/a	Typically grows on the bark of hardwood trees such as White Ash, Black Walnut, and American Elm. Can also be found growing on fence posts and boulders.	There are no recent records of the species in the Ottawa area (MECP, 2019f).	None.
Reptiles						

Species Name (*Taxonomic Name*)	Status under *Endangered Species Act* (ESA)	Status under Schedule 1 of the *Species at Risk Act* (SARA)	Observation Record Sources (within 10 km of the Site)	Habitat Description	Habitat on the Site	Potential to Interact with Development of the Site (None, Negligible, Low, Moderate, or High)[1]
Blanding's Turtle (*Emydoidea blandingii*)	**Threatened**	**Threatened**	Ontario Nature, 2019; MNDMNRF, 2021a; MNDMNRF, 2021b	Quiet lakes, streams, and wetlands with abundant emergent vegetation. Also frequently occurs in adjacent upland forests.	No suitable habitat directly on-Site. Mud Creek south of the Site provides suitable habitat. Mud Creek is not hydrologically connected to the wet depression within the parking lot expansion area on-Site.	Low
Eastern Musk Turtle / Stinkpot (*Sternotherus odoratus*)	**Special Concern**	**Special Concern**	n/a	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.	The Site does not appear to contain suitable habitat.	Negligible
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Special Concern**	**Threatened**	n/a	The Eastern Ribbonsnake is semi-aquatic. It is most frequently found along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	The Site does not appear to contain suitable habitat.	Negligible
Midland Painted Turtle (Chrysemys picta marginata)	**No Status**	**Special Concern**	n/a	Inhabits waterbodies, such as ponds, marshes, lakes, and slow-moving creeks that have a soft bottom and provide abundant basking sites and aquatic vegetation. Often bask on shorelines or on logs and rocks that protrude from the water.	The Site does not appear to contain suitable habitat.	Negligible
Milksnake (*Lampropeltis triangulum*)	**Not Listed**	**Special Concern**	n/a	Found in variety of open, scrubby or edge habitats, including pastures.	Open and edge areas on-Site may provide suitable habitat.	Low
Northern Map Turtle (*Graptemys geographica*)	**Special Concern**	**Special Concern**	Ontario Nature, 2019; California Academy of Science and National Geographic Society, 2021; MNDMNRF, 2021a; MNDMNRF, 2021b	Lives in rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer. In winter, they hibernate on the bottom of deep, slow-moving sections of river.	The site does not appear to contain suitable habitat.	Low

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Snapping Turtle (*Chelydra serpentina*)	**Special Concern**	**Special Concern**	Ontario Nature, 2019; MNDMNRF, 2021; MNDMNRF, 2021b	Spend most of their lives in the water. Prefer shallow waters so they can hide under the soft mud and leaf litter with only their noses exposed to the surface to breathe.	The Site does not appear to contain suitable habitat.	Low
Spiny Softshell (*Apalone spinifera*)	**Endangered**	**Threatened**	n/a	Found primarily in rivers and lakes but also in creeks, ditches, and ponds near rivers. Habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species.	The Site does not appear to contain suitable habitat.	Negligible
Spotted Turtle (*Clemmys guttata*)	**Endangered**	**Endangered**	n/a	Semi-aquatic and prefers ponds, marshes, bogs, and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation.	The Site does not appear to contain suitable habitat.	Negligible
Wood Turtle (*Glyptemys insculpta*)	**Endangered**	**Threatened**	n/a	Prefers clear rivers, streams, or creeks with a slight current and sandy or gravelly bottom. Wooded areas are essential habitat but they are found in other habitats such as wet meadows, swamps, and fields.	The Site does not appear to contain suitable habitat.	Negligible
Molluscs						
Hickorynut (*Obovaria olivaria*)			n/a		The Site does not appear to contain suitable habitat.	Low
Vascular Plants						
American Chestnut (*Castanea dentata*)	**Endangered**	**Endangered**	n/a	Typical habitat is upland deciduous forests on sandy acidic soils. Occurs with Red Oak, Black Cherry, Sugar Maple, and beech.	The Site does not appear to contain suitable habitat.	Negligible

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American Ginseng (*Panax quinquefolius*)	**Endangered**	**Endangered**	n/a	Grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple, White Ash, and American Basswood.	The Site does not appear to contain suitable habitat.	Negligible
Butternut (*Juglans cinerea*)	**Endangered**	**Endangered**	MNDMNRF, 2021a	Commonly found in riparian habitats but is also found on rich, moist, well-drained loams and well-drained gravels, especially those of limestone origin.	Moist hedgerow on-Site may provide suitable habitat.	Moderate
Eastern Prairie Fringed-orchid (*Platanthera leucophaea*)	**Endangered**	**Endangered**	n/a	Populations are found in three main habitat types: fens, tallgrass prairie, and moist old fields.	The Site does not appear to contain suitable habitat.	Negligible
Fish						
American Eel (*Anguilla rostrata*)	**Endangered**	**Endangered**	n/a	Primarily nocturnal, hiding in soft substrate or submerged vegetation during the day.	The Site does not appear to contain suitable habitat.	Negligible
Bridle Shiner (*Notropis bifrenatus*)	**Special Concern**	**Special Concern**	n/a	Prefers clear water with abundant vegetation over silty or sandy substrate.	The Site does not appear to contain suitable habitat.	Negligible
Channel Darter (*Percina copelandi*)	**Special Concern**	**Threatened**	DFO, 2019; MNDMNRF, 2021a	Prefers clean streams and lakes with moderate current over sandy or rocky substrate.	The Site does not appear to contain suitable habitat.	Low
Lake Sturgeon (*Acipenser fulvescens*)	**Endangered**	**No Status**	MNDMNRF, 2021a; MNDMNRF, 2021b	Only found in large lakes and rivers. Forages in cool water, 4-9 m deep over soft substrate; spawns in shallower, fast-flowing areas over rocks or gravel.	The Site does not appear to contain suitable habitat.	Low
Northern Brook Lamprey (*Ichthyomyzon fossor*)	**Special Concern**	**Special Concern**	DFO, 2019; MNDMNRF, 2021; MNDMNRF, 2021b	Inhabits clear, coolwater streams. The larval stage requires soft substrates such as silt and sand for burrowing which are often found in the slow-moving portions of a stream. Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel.	The Site does not appear to contain suitable habitat.	Low
Northern Sunfish (*Lepomis peltastes*)	**Special Concern**	**No Status**	n/a	Lives in shallow vegetated areas of quiet, slow flowing rivers and streams, as well as warm lakes and ponds with sandy banks or rocky bottoms.	The Site does not appear to contain suitable habitat.	Negligible

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River Redhorse (*Moxostoma carinatum*)	**Special Concern**	**Special Concern**	DFO, 2019	Prefers fast-flowing, clear rivers over rocky substrate.	The Site does not appear to contain suitable habitat.	Low
Silver Lamprey (*Ichthyomyzon unicuspis*)	**Special Concern**	**Special Concern**	DFO, 2019; MNDMNRF, 2021a	Requires clear water where they can find fish hosts, relatively clean stream beds of sand and organic debris for larvae to live in, and unrestricted migration routes for spawning. Larvae live 4-7 years in burrows (prefer soft substrates); filter-feed on plankton.	The Site does not appear to contain suitable habitat.	Low

[1]**None**: the range of the species does not overlap with the Site, the species is documented as no longer occurring in the ecoregion, or it is extremely unlikely for the species to occupy the Site due to access barriers.
Negligible: No observation records exist for within 10 km of the Site and the Site does not contain suitable habitat. The species has potential for unpredictable presence on/use of the Site.
Low: No observation records exist for within 10 km of the Site but suitable habitat exists on the Site, or suitable habitat does not exist on the Site but observation records exist for within 10 km.
Moderate: The species is known to occur within 10 km of the Site and suitable habitat exists on the Site.
High: The species is known to occur on or adjacent to the Site and suitable or confirmed habitat exists on the Site.

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Appendix H Clean Equipment Protocol for Industry

Clean Equipment Protocol for Industry

Inspecting and cleaning equipment for the purposes of invasive species prevention

Invasive Species Centre

Catalyst for research and response

Ontario

Peterborough County Stewardship

ONTARIO INVASIVE PLANT COUNCIL

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For more information on invasive plants in Ontario, visit www.ontario.ca/invasivespecies, www.ontarioinvasiveplants.ca, www.invadingspecies.com, or www.invasivespeciescentre.ca.

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Introduction

Why Invasive Plants are a Problem

Invasive alien species are "a growing environmental and economic threat to Ontario. Alien species are plants, animals and microorganisms that have been accidentally or deliberately introduced into areas beyond their normal range. Invasive species are defined as harmful alien species whose introduction or spread threatens the environment, the economy, or society, including human health (Government of Canada 2004)." (Ontario Invasive Species Strategic Plan, 2012). The great majority of plant invasions occur in habitats that have been disturbed either naturally or by humans (Rejma´nek 1989; Hobbs and Huenneke 1992; Hobbs 2000).

The ecological effects of invasive species are often irreversible and, once established, they are extremely difficult and costly to control or eradicate. According to Pimental et al. (1999), invasive species in the U.S. cause economic and environmental damages totalling over $138 billion per year, with agricultural weed control and crop losses totalling approximately $34 billion per year. Exact figures for the total economic and environmental damages are not available for Canada. In Ontario however, the costs of dealing with just one invasive species is astonishing; Zebra Mussels cost Ontario power producers who draw water from the lake $6.4 million per year in increased control/operating costs and about $1 million per year in research costs (Colautti et al. 2006).

Invasive species can spread to new areas when contaminated mud, gravel, water, soil and plant material are unknowingly moved by equipment used on different sites. This method of spread is called an unintentional introduction, and is one of the four major pathways for invasive species introduction into a new area of Ontario (Ontario Invasive Species Strategic Plan, 2012).

Buckthorn removal, Lynde Shores Conservation Area.
Photo by: Central Lake Ontario Conservation Authority

Invasive plant seed and other propagules (plant material, i.e. rhizomes) have the ability to travel sight unseen in mud attached to or lodged in various parts and spaces between parts of vehicles, machinery and other mechanical equipment. A recent study at Montana State University found that most seeds (99% on paved roads and 96% on unpaved roads) stayed attached to the vehicle after traveling 160 miles (257 km) under dry conditions.

Invasive plant species are commonly transported on or in vehicles and construction equipment when they are moved to new locations. Those vehicles include four-wheel drives, excavators, tractors, loaders, water trucks and all-terrain vehicles. Failure to properly clean vehicles and machinery of soils, mud, and contaminated water that may contain invasive species seed and propagules can result in permanent, irreversible environmental impacts. These impacts can mean substantial cost to the landowner, land manager and/or the user. Businesses may also face liability issues for activities and operations that result in the introduction of invasive species.

Some of the invasive species in Ontario which have been known to spread through equipment transfer include:

- **Common Buckthorn** *(Rhamnus cathartica)*
- **Dog-strangling Vine** *(Cynanchum rossicum)*
- **Garlic Mustard** *(Alliaria petiolata)*
- **Giant Hogweed** *(Heracleum mantegazzianum)*
- **Glossy Buckthorn** *(Frangula alnus)*
- **Japanese Knotweed** *(Polygonum cuspidatum)*
- **Miscanthus or Chinese Silver Grass** *(Miscanthus sinensis)*
- **Invasive Phragmites or Common Reed** *(Phragmites australis subsp. australis)*
- **Reed Canary Grass** *(Phalaris arundinacea)*
- **Wild Parsnip** *(Pastinaca sativa)*
- **Wild Chervil** *(Anthriscus sylvestri)*

Dog-strangling Vine
(Cynachum rossicum)
Photo by: Hayley Anderson

Garlic Mustard
(Alliaria petiolata)
Photo by: Ken Towle

Invasive Phragmites
(Phragmites australis subsp. australis)
Photo by: Michael Irvine

These plants impact biodiversity by out-competing native species for space, sunlight, and nutrients. They can also have impacts on road and driver safety by physically blocking intersection sightlines, and in the case of invasive *Phragmites* and *Miscanthus*, may fuel intense grass fires if ignited, which can damage utility stations and hydro lines.

The harmful effects of invasive species include:

- Physical and structural damage to infrastructure
- Human health hazards (i.e. giant hogweed and wild parsnip exposure)
- Delays and increased cost in construction activities
- Environmental damage (i.e. erosion)
- Aesthetic degradation
- Loss of biodiversity
- Reduced property values
- Loss of productivity in woodlots and agriculture

Why Cleaning Vehicles and Equipment is Important

Passenger and recreational vehicles as well as heavy machinery are major vectors for spreading terrestrial invasive species into new areas.

Preventing the spread of invasive species has proven to be considerably more cost effective than controlling established populations. The spread of invasive species through unintentional introduction can be minimized significantly by the diligent cleaning of vehicles and equipment when leaving one site and moving to the next. In the case of large properties, cleaning before moving to a new site is recommended, even if it is within the same property.

This guide has been developed for the construction, agriculture, forestry, and other land management industries, to provide equipment operators and practitioners with tools and techniques to identify and prevent the unintentional introduction of invasive species. It establishes a standard for cleaning vehicles and equipment and provides a guide where current codes of practice, industry standards or other environmental management plans are not already in place.

Passenger and recreational vehicles include:

- 2WD and 4WD cars
- 2WD and 4WD trucks
- All Terrain Vehicles (ATV's)
- Motorbikes
- Snowmobiles

Heavy machinery includes:

- Trucks
- Tractors
- Mowers
- Slashers
- Trailers
- Backhoes
- Graders
- Dozers
- Excavators
- Skidders
- Loaders
- Water Tankers and Trucks

Dog-strangling Vine plants attached to ATV.
Photo by: Francine Macdonald

Plant material attached to bobcat.
Photo by: TH9 Outdoor Services

Impacts of Invasive Species on Industry

Construction

In the UK, Japanese Knotweed (*Polygonum cuspidatum* or *Fallopia japonica*) is classified as a hazardous material. When construction occurs in established Japanese Knotweed stands workers sift the soil to remove root fragments and institute treatment plans to ensure that the Knotweed does not re-sprout, as it can damage housing foundations by growing through concrete and asphalt. The contractors must also thoroughly clean their equipment, and dispose of the contaminated soil at biohazard waste sites. While we do not have these requirements in Ontario, Japanese Knotweed is present here.

Invasive plant species can also increase site preparation and weed control costs, and reduce property values. For example, in Vermont the presence of the aquatic invasive plant Eurasian Watermilfoil (*Myriophyllum spicatum*) depressed shoreline residence property value by as much as 16.4% (Zhang and Boyle, 2010).

Forestry/Agriculture

Invasive plant species which become established in forests will out-compete native species and prevent forest re-generation after logging or natural disturbance. Dog-strangling Vine (*Cynanchum rossicum*) is of particular concern in conifer plantations. This species thrives in the filtered light and open soils of mature plantations, and suppresses seedling establishment of native hardwoods. If its invasion continues, very few juvenile trees will survive to fill the shrinking canopy of over-mature pines. Reforestation sites are also susceptible; the thick mats of vegetation and aggressive competition from Dog-strangling Vine decrease available planting space and increase costs as more mature vegetation needs to be planted in order to ensure the new vegetation can outcompete the invasive plant. As a result, expensive control programs are often required.

Land Management (Trail Use/Maintenance)

Recreational trail use and the maintenance of trails can facilitate the transport of invasive plant material and seeds, and create open and disturbed sites that are prime locations for the establishment of invasive species. Studies have proven that trails act as corridors which assist in the spread of invasive plant species. Humans, their pets, and vehicles such as ATV's can be vectors of invasion along trails because seeds and plant pieces can be carried on equipment and clothing. In addition, frequent trampling along trails alters soil properties, limits the growth of some native species, and creates conditions that may favour the growth of non-native species (Kuss et al. 1985; Marion et al. 1985; Yorks et al. 1997).

Roadsides/Utilities

Invasive species can increase the cost of roadside and utility maintenance by requiring additional maintenance and control efforts. The presence of invasive species can also provide a safety hazard. In the case of Phragmites and Miscanthus (invasive grass species), along with interrupting sight lines, the dead stalks which remain standing each autumn also provide combustible material. Fires in these stands burn intensely, and can damage utilities and hydro lines. Phragmites along roadsides is generally assumed to be spread through the transport and burial of rhizome fragments through ditching, ploughing, and other human activities that transport rhizomes on machinery. Studies have shown that vehicles and road-fill operations can transport invasive plant seeds into uninfested areas, and road construction and maintenance operations provide optimal disturbed sites for seed germination and seedling establishment (Schmidt 1989; Lonsdale & Lane 1994; Greenberg et al. 1997; Trombulak & Frissell 2000).

Steps to Prevent the Unintentional Introduction of Invasive Species from Equipment

Inspection and cleaning of all machinery and equipment should be performed in accordance with the procedures, checklists and diagrams provided in this protocol.

When visiting more than one site, always schedule work in the sites that are the least disturbed and free of known invasive species first, and visit sites with known invasive species infestations last. This will greatly reduce the risk of transferring plants to new locations.

When to Inspect

Inspection should be done before:

- Moving vehicles out of a local area of operation
- Moving machinery between properties or sites within the same property where invasive species may be present in one area, and not in another
- Using machinery along roadsides, in ditches, and along watercourses
- Vehicles using unformed dirt roads, trails or off road conditions
- Using machinery to transport soil and quarry materials
- Visiting remote areas where access by vehicles is limited

Inspection should be done after:

- Operating in areas known to have terrestrial invasive plants or are in high risk areas (i.e. recently disturbed areas near known invaded areas)
- Transporting material (i.e. soil) that is known to contain, or has the potential to contain, invasive species
- Operating in an area or transporting material that you are uncertain contain invasive species
- In the event of rain. If mud contains seeds, they can travel indefinitely until it rains or the road surface is wet, allowing for long distance transport. This may result in transporting seeds to areas where those species did not previously exist

How to Inspect

- Inspect the vehicle thoroughly inside and out for where dirt, plant material and seeds may be lodged or adhering to interior and exterior surfaces.
- Remove any guards, covers or plates that are easy to remove.
- Attention should be paid to the underside of the vehicle, radiators, spare tires, foot wells and bumper bars.

If clods of dirt, seed or other plant material are found, removal should take place immediately, using the techniques outlined below.

When to Clean

Vehicles and heavy equipment that stay on formed and sealed roads have a low risk of spreading invasive species. Cleaning is only required when inspection identifies visible dirt clods and plant material or when moving from one area to another.

Depending on the invasive species present, vehicles may need to be cleaned even when deep snow is present. Invasive *Phragmites*, for example, can still be spread, even in packed snow because the seed heads are usually above the surface of the snow. Other plants, such as dog-strangling vine, will be contained beneath deep snow.

**Regular inspection of vehicles and machinery will identify if any soil or plant material has been collected on or in vehicles and machinery.*

Where to Clean

Clean the vehicle/equipment in an area where contamination and seed spread is not possible (or limited). The site should be:

- Ideally, mud free, gravel covered or a hard surface. If this option is not available, choose a well maintained (i.e. regularly mowed) grassy area.
- Gently sloping to assist in draining water and material away from the vehicle or equipment. Care should be taken to ensure that localized erosion will not be created, and that water runs back into the area where contamination occurred.
- At least 30m away from any watercourse, water body and natural vegetation.
- Large enough to allow for adequate movement of larger vehicles and equipment.

**Safely locate the vehicle and equipment away from any hazards. If mechanized, ensure engine is off and the vehicle or equipment is immobilized.*

How to Clean Inside

Clean the interior of the vehicle by sweeping, vacuuming or using a compressed air device. Particular attention should be paid to the floor, foot wells, pedals, seats, and under the seats.

How to Clean Outside

Knock off all large clods of dirt. Use a pry bar or other device if necessary.

Identify areas that may require cleaning with compressed air rather than water such as radiators and grills. Clean these areas first prior to using water.

Clean the vehicle with a high pressure hose in combination with a stiff brush and/or pry bar to further assist the removal of dirt clods.

Start cleaning from the top of the vehicle and work down to the bottom.

Emphasis should be placed on the undersides, wheels, wheel arches, guards, chassis, engine bays, radiator, grills, and other attachments.

When the cleaning is finished avoid driving through the waste water when removing the vehicle or equipment from the cleaning site.

For equipment such as water trucks that may be exposed to aquatic invasive species, trucks should be disinfected with bleach solution before conducting work in a new area. For further information please refer to the Invading Species Awareness Program's Technical Guidelines listed under Contacts and Resources.

Hosing down a vehicle in Queensland, Australia
Photo by: TH9 Outdoor Services

Final Inspection Checklist

Conduct a final inspection to ensure the following general clean standard has been achieved:

- No clods of dirt should be visible after wash down.
- Radiators, grills, and the interiors of vehicles should be free of accumulations of seed, soil, mud and plant material parts including seeds, roots, flowers, fruit, and or stems.

Diagrams have been provided to assist in quickly identifying key areas to inspect and clean on a variety of vehicles associated with the targeted industries. These can be used in combination with vehicle checklists to ensure all areas of the vehicles have been inspected and cleaned.

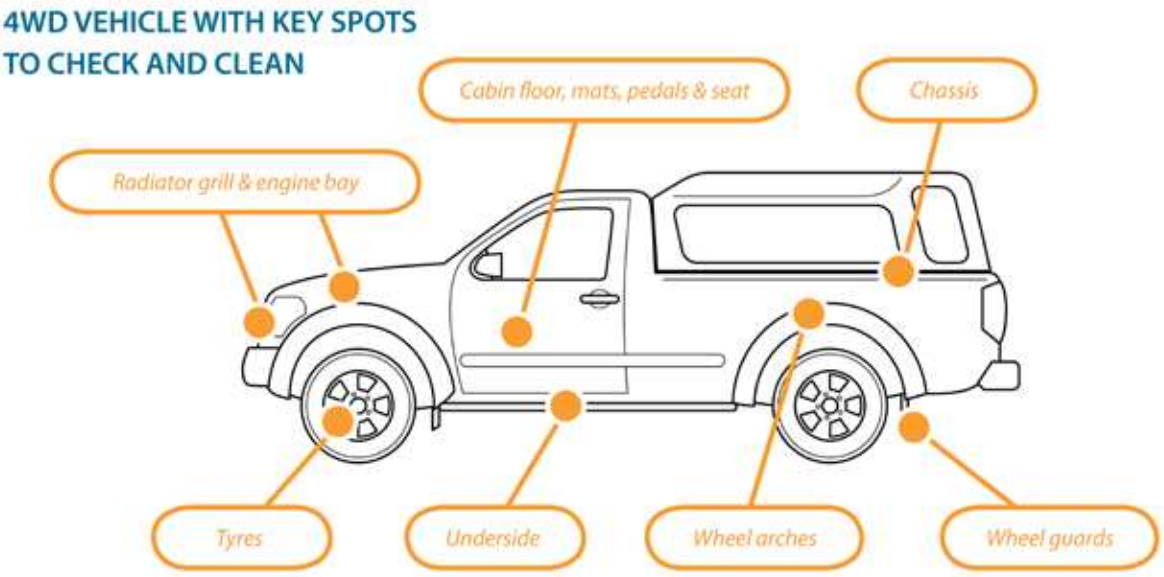
Equipment Required

- A pump and high pressure hose OR high pressure water unit
- Minimum water pressure for vehicle cleaning should be at least 90 pounds per square inch. Water can be supplied as high volume/low pressure or low volume/high pressure (NOAA Fisheries Service).
- Air compressor and blower OR vacuum
- Shovel
- Pry bar
- Stiff brush or broom

Cleaning station at construction site.
Photo by: Mark Heaton, OMNR

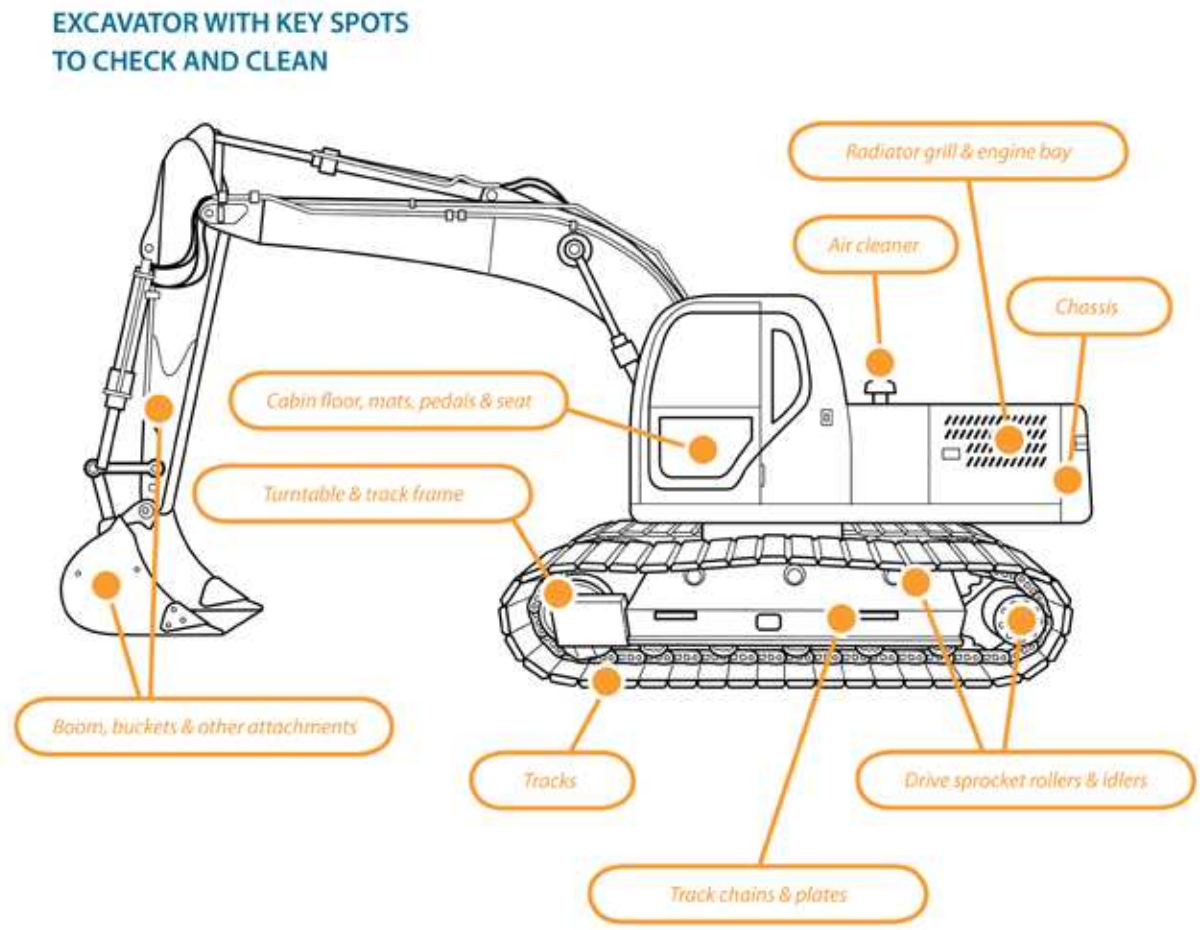
Inspection and Cleaning Diagrams and Checklists

2WD and 4WD Vehicles



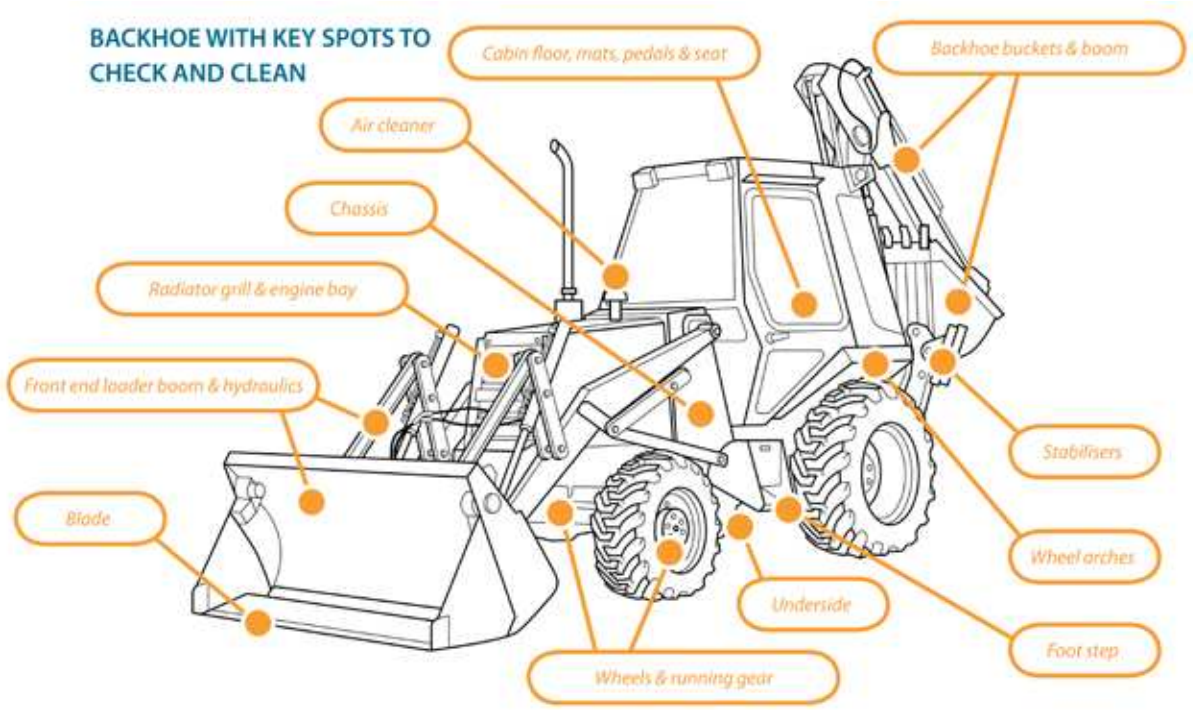
		✓
Cabin	Floor, mats, pedals, seats	
Engine	Radiators, engine bay, grill	
Body	Underside, chassis, crevices, ledges, bumper bars	
Wheels	All wheels (including spare), wheel arches, guards	
Tray	Floor, canopy (if included)	

Excavator



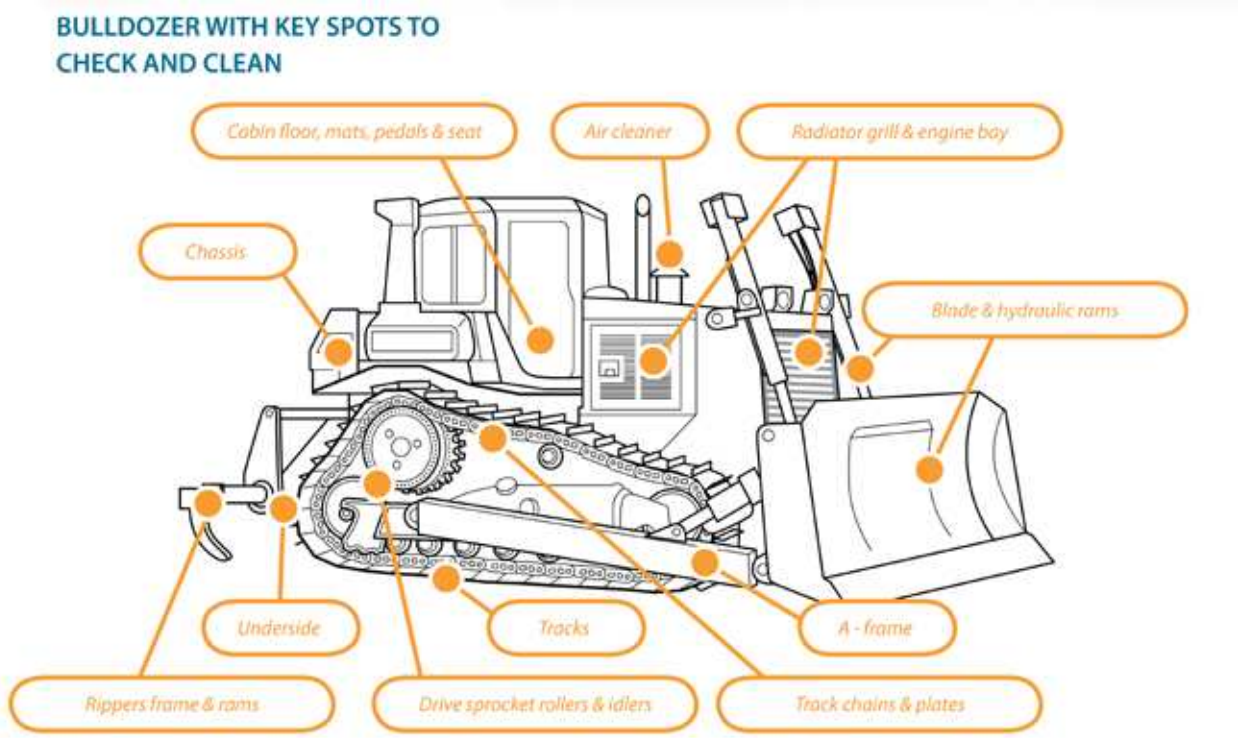
		✓
Cabin	Floor, mats, pedals, seats	
Engine	Radiators, engine bay, grill, air cleaner	
Tracks	Tracks, track frame, drive sprocket rollers, idlers	
Body Plates	Plates of cabin	
Body	Ledges, channels	
Bucket		
Booms		
Turret Pivot		

Backhoe



		✓
Cabin	Floor, mats, pedals, seats, foot step	
Engine	Radiators, engine bay, grill, air cleaner	
Wheels	All wheels (including spare), wheel arches, guards	
Front end loader	Blade, hydraulics, booms	
Backhoe	Buckets, boom, hydraulics, stabilisers	

Bulldozer



		✓
Cabin	Floor, mats, pedals, seats	
Engine	Radiators, engine bay, grill, air cleaner	
Tracks	Tracks, track frame, drive sprocket rollers, idlers	
Body Plates	Belly plates, rear plates	
Body	Ledges, channels	
Blade	Pivot points, hydraulic rams, a-frame	
Ripper	Ripper frame, ripper points	

Contacts and Resources

Ontario Invasive Species Strategic Plan 2012. Government of Ontario. Online, accessed May 8, 2012.
http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@biodiversity/documents/document/stdprod_097634.pdf

Invasive Species Management for Infrastructure Managers and the Construction Industry 2008. Wade, M. Booy, O. and White, V. Online, accessed April 27, 2012.
http://www.ciria.org/service/Web_Site/AM/ContentManagerNet/ContentDisplay.aspx?Section=Web_Site&ContentID=9001

T.I.P.S (Targeted Invasive Plant Solutions) Highway Operations. British Columbia Invasive Species Council. Online, accessed May 8, 2012.
http://www.bcinvasiveplants.com/iscbc/publications/TIPS/Highways_Operations_TIPS.pdf

Invading Species Awareness Program Workshop Manual: Aquatic Invasive Species: An Introduction to Identification, Collection and Reporting of Aquatic Invasive Species in Ontario Waters (includes information on decontaminating equipment).
http://www.invadingspecies.com/download/publications/manuals/WorkshopManual.pdf

Reporting Invasive Species

To report invasive species, or view maps of existing records, visit the Invading Species Awareness Program website www.invadingspecies.com/report/ or www.eddmaps.org/Ontario.

Or call the OFAH/MNR Invading Species Awareness Program Hotline at **1-800-563-7711.**

Acknowledgements

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We also sincerely thank the Clean Equipment Protocol Working Group and the Ontario Invasive Plant Council Committees and Board of Directors for their ongoing support and valuable input into this document, and the Canada-Ontario Invasive Species Centre and Ontario Ministry of Natural Resources for the support in creating this protocol.

Clean Equipment Protocol Working Group:

Diana Shermet, Central Lake Ontario Conservation Authority; Paula Berketo, Ontario Ministry of Transportation; Travis Cameron, Ontario Ministry of Natural Resources; Jennifer Hoare, Ontario Parks; Michael Irvine, Ontario Ministry of Natural Resources; Alison Kirkpatrick, OFAH/MNR Invading Species Awareness Program; Erika Weisz, Ontario Ministry of Natural Resources; Amanda Chad, Ontario Power Generation; Nancy Vidler, Lambton Shores Phragmites Community Group; Nigel Buffone, Du Pont Canada Company; Ewa Bednarczuk, Lower Trent Conservation Authority

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More Information:

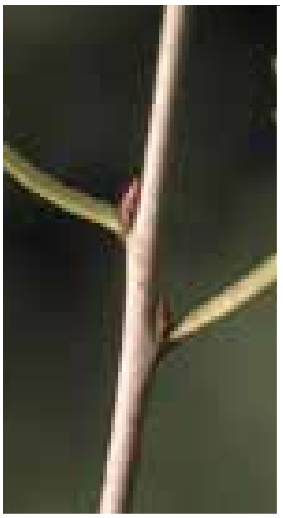
Ontario Invasive Plant Council: www.ontarioinvasiveplants.ca

Appendix A: Identification of Invasive Plants Found in Ontario

- **Common Buckthorn** (*Rhamnus cathartica*) and **Glossy Buckthorn** (*Frangula alnus*)
- **Dog-strangling Vine** (*Cynanchum rossicum*)
- **Garlic Mustard** (*Alliaria petiolata*)
- **Japanese Knotweed** (*Polygonum cuspidatum*)
- **Phragmites or Common Reed** (*Phragmites australis subsp. australis*)
- **Giant Hogweed** (*Heracleum mantegazzianum*)

common & glossy buckthorn

(Rhamnus cathartica & R. frangula)



Plant type: Shrub/small tree

Arrangement: Common buckthorn are sub-opposite (almost opposite). Glossy buckthorn are alternate.

Leaf: The common buckthorn leaf is egg shaped, edge of the leaf is "pebbled" (small rounded teeth). Veins converging toward leaf top. The glossy buckthorn leaf is more slender (tear drop shaped) and smooth margined.

Bark: Smooth, young bark with prominent raised patches or lenticels; rough texture and peeling bark when mature.

Seed/Flowers: Flowers are green-yellowish, small and inconspicuous. Green berries becoming purplish/black in late summer, berry > 1 cm in diameter.

Buds/Twigs: Common buckthorn has thorn-like tip on many twigs. Glossy buckthorn buds have no bud scales and lack thorny tips to twigs.

Habitat: Various - forest, thickets, meadows, dry to moist soils.

Similar native species: Native dogwoods, which lack the thorny "tip". Native dogwoods are truly opposite in arrangement of twigs; only alternate leaved (pagoda) dogwood has alternate branching.

dog-strangling vine
(Cynanchum rossicum & C. nigrum)



Plant type: Herb, twining vine

Arrangement: Opposite

Leaf: Lance shaped, smooth margin (edge)

Bark: n/a

Seed/Flowers: Bean shaped seed pod with seeds attached to downy 'umbrellas'. Flowers - pink (C. rossicum) or purple (C. nigrum) with five petals.

Buds/Twigs: n/a

Habitat: Dry to moist soils; more dominant in meadows and woodland edges.

Similar native species: Swamp milkweed (Asclepias incarnata spp.), is an upright plant, typically found in wetland habitats.

garlic mustard
(Alliaria petiolata)



Plant type: Herb

Arrangement: Alternate

Leaf: Saw tooth like edge, elongated heart shape. Garlic/onion smell when crushed. Leaves are kidney shaped with prominent veins.

Bark: n/a

Seed/Flowers: Cluster of small white flowers with four petals. Small black < 1 mm rounded seed found in elongated 'tube-like' seed pods (similar to a bean pod).

Buds/Twigs: n/a

Habitat: Various – dry to moist soils, in all habitat types, less often in meadows.

Similar native species: n/a

japanese knotweed
(Polygonum cuspidatum)



Plant type: Herb, 2 - 4 m in height.

Arrangement: Alternate

Leaf: Tear drop shaped, sharp pointed, dark green, flattened at base.

Bark: n/a

Seed/Flowers: Flowering stalk of many small greenish-white flowers.

Buds/Twigs: Large plant with a 'bamboo-like' stem. Stem light green maturing to tan colour.

Habitat: Moist to wet soils found in wetlands, water-courses and roadside ditches.

Similar native species: None.

common reed
(Phragmites australis)



Plant type: Grass

Arrangement: Alternate

Leaf: Broad leaf > 1 cm wide.

Bark: n/a

Seed/Flowers: Dense cascading 'broom-like' flower head. 'Cottony' in appearance when mature.

Buds/Twigs: Stems rough and ridged, ligule a densely hairy band. Mature plants > 3 m tall.

Habitat: Moist to wet soils. Found in wetlands, water- courses and road side ditches.

Similar native species: Species of mannagrass (Glyceria sp) including tall northern, eastern and rattlesnake grass. A native common reed exists but has a smooth stem and the ligule is not hairy. It is also quite rare.

giant hogweed
(Heracleum mantegazzianum)

Plant type: Herb. Mature plants can be over 3m tall.

Arrangement: Alternate

Leaf: Lobed leaf 1-2 m wide, lobes sharp-pointed.

Bark: n/a

Seed/Flowers: Small, white flowers in a large umbrella-shaped cluster, .75 m wide.

Buds/Twigs: Hairy stem with purple spots.

Habitat: Fresh to wet soils in forests, swamps, meadows, marshes.

Similar native species: Cow parsnip *(Heracleum maximum)* – has smaller flowers, no purple spots on stems.Angelica (Angelica atropurpurea) has a rounded-topped flower cluster and leaves divided into many leaflets.

Do not touch this plant because it is poisonous. If you do, wash your skin immediately in cool soapy water and do not expose the area to sunlight.

Seek professional advice before removing.

Identification of Invasive Plants found in Ontario Photos by:

Credit Valley Conservation, Greg Bales, Ken Towle, Patrick Hodge,
Ontario Federation of Anglers and Hunters, Francine Macdonald, Matt Smith

ONTARIO
INVASIVE PLANT
COUNCIL

Appendix I Landscape Plan

OPTION 2

TOTAL CANOPY AREA Opt2 = 3030m²
TOTAL PARKING AREA Opt2 = 7660m²
Percentage cover = 39.6%

Innes Road

ADDITIONAL TREE LOCATIONS SHOWN

PARKING LOT AREA USED FOR TREE CANOPY CALCULATIONS

- INCLUDES AREA REQUIRED TO PLANT THE TREES USED FOR CANOPY CALCULATIONS

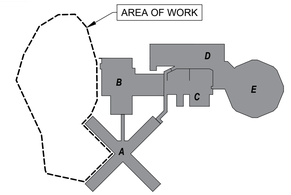
TOTAL PROPOSED TREES: 31

TOTAL PROPOSED SHRUBS: 9+

LEGEND

- PARKING LOT EXTENTS
- TREE CANOPY WITHIN PARKING LOT EXTENTS
- EXISTING TREE
- PROPOSED TREE
- PROPOSED SHRUB

KEY PLAN



No	Revisions	Date
05		
04		
03		
02		
01	FOR REVIEW	2023/01/27

Orientation

Seal

The Contractor shall check and verify all dimensions and report all errors and omissions to the IO–Owner's/MBS Designee (as applicable) for his/her written direction before proceeding with the Work.

A/B — A Detail No; B Sheet No where detailed

PROJECT ENGINEER: CIVIL, STRUCTURAL, MECHANICAL & ELECTRICAL

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS
1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
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Ontario
Infrastructure Ontario

AMIS N B

Project
OTTAWA CARLETON DETENTION CENTRE
TEMPORARY PARKING LOT EXPANSION

Location
INNES ROAD, GLOUCESTER TOWNSHIP
OTTAWA

IO Project No | Site No | Building No

Client
MCSCS

Drawing Title
TREE CANOPY PLAN
OPTION 2

Scale: AS NOTED	Date: JANUARY 2023
Drawn by: ITF	Substantial Performance Date: –
Designed by: IMR	Drawing No: L-02 of
Approved by:	CADD File NAME: –

24"36"
24x36in