MORRISON HERSHFIELD

REPORT

# Baseline/Woodroffe Stormwater Management Pond Environmental Assessment

Ottawa, ON

Presented to:

**City of Ottawa**
**June 8, 2017**

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| Joelle Doubrough | Kelly Roberts | June 8, 2017 |
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# EXECUTIVE SUMMARY

The City of Ottawa has undertaken a Municipal Class Environmental Assessment (EA) for a proposed stormwater management pond (SWMP) at the northeast corner of Baseline Road and Woodroffe Avenue on property owned by the National Capital Commission (NCC). A stormwater management facility was initially recommended in the Pinecrest Creek/Westboro Stormwater Management Retrofit Study (JFSA, 2011) and underwent further assessment in the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (JFSA, 2015).

The Baseline/Woodroffe SWMP will mitigate the impacts of uncontrolled runoff from the highly urbanized subwatershed of Pinecrest Creek. It will contribute to improved water quality, reduce erosion, and lessen the risk of flooding along Pinecrest Creek.

Various stormwater management retrofit opportunities and scenarios for the Pinecrest Creek/Westboro area, including lot level measures, stormwater conveyance systems, and end-of-pipe facilities were considered in the Retrofit Study (JFSA, 2011). Six end-of-pipe locations were evaluated within five alternative retrofit scenarios. The five alternatives included:

- Do Nothing (existing conditions)
- Highest Practical SWM Implementation without End-of-Pipe Facilities
- Highest Practical SWM Implementation with End-of-Pipe Facilities
- Moderate SWM Implementation with End-of-Pipe Facilities
- Public Property Only SWM Implementation with End-of-Pipe Facilities

The preferred SWM alternative was determined to be the Moderate SWM Scenario with End-of-Pipe facilities, which included the proposed site for the Baseline Road and Woodroffe Avenue SWMP (JFSA, 2011).

The facility specifications and requirements for the proposed pond were refined and two conceptual designs (Option 1 and Option 2 (2a and 2b)) developed which were then reviewed by the NCC (JFSA, 2015). Both pond options were designed to maximize water quality and flood control benefits while minimizing negative impacts to the fluvial geomorphic conditions of the creek.

This EA has considered the findings from the 2011 JFSA Retrofit Study and the 2015 JFSA Feasibility Study and has evaluated the environmental impacts of the proposed SWMP. The assessment indicates that with the suggested mitigation measures, the pond will not create any significant negative environmental impacts during pre-construction, construction, or operational phases. Positive impacts to water quality, fluvial geomorphology and flooding conditions within the Pinecrest Creek have been identified.

The EA will be brought to City of Ottawa Council for review and approval of the preferred alternative. Once approved, the EA will be placed on the public record for a public review period. Provided there are no objections from the public, the project may proceed to design and implementation.

# ACRONYMS

| | |
|---|---|
| ANSI | Areas of Natural and Scientific Interest |
| BMP | Best Management Practice |
| BRT | Bus Rapid Transit |
| BRRTC | Baseline Road Rapid Transit Corridor |
| CCME | Canadian Council of Ministers of the Environment |
| CEAA | Canadian Environmental Assessment Act |
| CDS | Continuous Deflection Separation |
| CIS | Cumulative Impacts Study |
| COSEWIC | Committee on the Status of Endangered Wildlife in Canada |
| CULP | Capital Urban Lands Plan |
| DFO | Department of Fisheries and Oceans |
| EA | Environmental Assessment |
| EAA | Environmental Assessment Act |
| EoP | End-of-Pipe |
| ESA | Environmental Site Assessment |
| FLUDA | Federal Land Use and Design Transaction Approval |
| GIS | Geographic Information System |
| GMP | Greenspace Master Plan |
| HLUI | Historical Land Use Information |
| HP | Highest Practical |
| HWM | High Water Mark |
| IMP | Infrastructure Master Plan |
| JFSA | J.F. Sabourin & Associates Limited |
| LOS | Level of service |
| LRT | Light Rail Transit |
| m.b.g.s. | Metres below ground surface |
| MCEA | Municipal Class Environmental Assessment |
| MHL | Morrison Hershfield Limited |
| MNRF | Ministry of Natural Resources and Forestry |
| MOE | Ministry of the Environment |
| MOECC | Ministry of the Environment and Climate Change |
| MSDS | Material Safety Data Sheet |
| MTO | Ministry of Transportation |
| NCC | National Capital Commission |
| NHIC | Natural Heritage Information Centre |
| NPA | Navigation Protection Act |
| OESA | Ontario Endangered Species Act |
| OLRT | Ottawa Light Rail Transit |
| OGS | Oil-and-Grit Separators |

| | |
|---|---|
| OP | Official Plan |
| OPA | Official Plan Amendment |
| ORAP | Ottawa River Action Plan |
| PCB | Polychlorinated biphenyl |
| PFCC | Plan for Canada's Capital |
| PPS | Provincial Policy Statement |
| PSW | Provincially Significant Wetland |
| PTTW | Permit to take Water |
| P/W Study | Pinecrest Creek/Westboro Stormwater Management Retrofit Study |
| ROW | Right-of-Way |
| RVCA | Rideau Valley Conservation Authority |
| SAR | Species at Risk |
| SARA | Species at Risk Act |
| SCS | Soil Conservation Service |
| SJAMP | Sir John A. MacDonald Parkway |
| STLA | Sid Thakar Landscape Architects |
| SWM | Stormwater Management |
| SWMP | Stormwater Management Pond |
| TAC | Technical Advisory Committee |
| TMP | Transportation Master Plan |
| TP | Total Phosphorous |
| TS | Transfer Station |
| TSS | Total Suspended Solids |

# 1. INTRODUCTION AND BACKGROUND

## 1.1 Project Overview

The City of Ottawa has undertaken a Municipal Class Environmental Assessment (Class EA) for a proposed Stormwater Management Pond (SWMP) at the northeast corner of Baseline Road and Woodroffe Avenue (Figure 1-1). The SWMP was initially recommended in the Pinecrest Creek/Westboro Stormwater Management Retrofit Study (JFSA, 2011) and underwent further assessment in the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (JFSA, 2015).

In order to satisfy the requirements of the Class EA process for the proposed Baseline/Woodroffe SWMP, alternatives of the SWMP will be confirmed, assessed and the process documented, with due consideration for the work previously undertaken.


**Figure 1-1: Study Area Location**

## 1.2 Background

The Pinecrest Creek/Westboro area – like much of the core of the City – was developed before there was a requirement for municipalities to manage stormwater. For this reason there are few facilities to treat stormwater in this area. Existing erosion, water quality concerns, and degraded health of the creek, stem in whole, or in part, from uncontrolled stormwater runoff.

In response to the on-going erosion in the Pinecrest Creek corridor, the National Capital Commission (NCC), which owns most of the creek corridor lands, commissioned a restoration

plan in 2006 to better accommodate the current flow regime within the creek. The resultant Pinecrest Creek Restoration Plan (JTB Environmental Services et al, 2007) identified and prioritized a number of projects along the length of the creek, some of which were implemented in 2008.

The City has also completed studies related to the impacts of wet weather flows on Westboro Beach and the Ottawa River. The untreated runoff from both Pinecrest Creek, and from storm outfalls discharging directly to the Ottawa River upstream of Westboro Beach, have been identified as contributing factors to frequent beach closures due to elevated bacterial counts in the Ottawa River.

### 1.2.1 Ottawa River Action Plan (ORAP)

On February 24, 2010, Ottawa City Council adopted the Ottawa River Action Plan (ORAP).

Two key objectives of ORAP are:

- To maintain a healthy aquatic ecosystem, with a focus on addressing challenges presented by existing development and infrastructure; and
- To optimize recreational use and economic development of the Ottawa River, with a focus on reducing beach closures.

To achieve these objectives, ORAP identified 17 separate projects to address the impacts of uncontrolled stormwater runoff.

### 1.2.2 Pinecrest Creek/Westboro SWM Retrofit Study

Of the 17 separate projects that comprise ORAP, two include the development of stormwater management (SWM) retrofit plans for areas of the City that were developed with little or no SWM. The first of these studies, the Pinecrest Creek/Westboro SWM Retrofit Study (P/W SWM Retrofit Study), has been completed and has identified a long-term plan comprised of a range of retrofit programs/capital projects, monitoring and outreach efforts aimed at reversing or partially reversing the historical impacts of development on the creek and local reach of the Ottawa River.

The P/W SWM Retrofit Study provides a strategy to decrease the impacts of uncontrolled urban runoff on Pinecrest Creek and the local reach of the Ottawa River. This study was endorsed by City Council on October 26, 2011:

http://ottawa.ca/calendar/ottawa/citycouncil/occ/2011/10-26/englishminutes23.htm

The overall purpose of completing the P/W SWM Retrofit Study was to recommend a combination of SWM retrofit measures to apply in the Study Area that would provide the best solution considering a number of economic, environmental and social factors.

One of the preferred solutions identified in the P/W SWM Retrofit Study was a SWMP on National Capital Commission (NCC) property at the northeast corner of Baseline Road and Woodroffe Avenue to treat approximately 435 hectares of primarily urban residential area currently draining directly to Pinecrest Creek.

In addition to the extent of SWM retrofit works recommended, additional City projects and future development anticipated to create potential impacts on the creek include:

- The removal of bus rapid transit (BRT) infrastructure and the extension of light rail transit (LRT) through the Pinecrest Creek corridor (Western LRT/Stage 2)
- LRT bundled projects, including Ministry of Transportation (MTO) Highway 417 widening and Richmond Road Complete Streets design;
- The Baseline Road Rapid Transit Corridor (BRRTC);
- The Southwest Transitway extension (to Hunt Club); and
- Further development/re-development within the subwatershed.

### 1.2.3 Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue

Additional consultation with NCC staff following completion of the P/W SWM Retrofit Study and in relation to the construction of a new storm outfall for Baseline transit station (now built, to be commissioned in future) led to the preparation of the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (JFSA, 2015). The draft results of this study were presented to NCC staff on March 26, 2013 from which resulted the following requirements for moving forward with the retrofit pond:

- The cumulative effects of all anticipated major projects (listed above in section 1.2.2) on the Pinecrest Creek corridor and adjacent NCC lands are to be investigated and addressed in a comprehensive manner;
- A commitment from the City to proceed with the implementation of retrofit measures beyond the ‘’end-of-pipe’’ that will include retrofits within the right-of-way and at the lot level throughout the Pinecrest Creek subwatershed (as recommended in the P/W SWM Retrofit Study); and
- Demonstration that the proposed pond design will have significant positive environmental, visual and landscaping benefits for the open space corridor and maintain a recreational pathway link through this area.

# 2. STUDY PROCESS

## 2.1 Municipal Class Environmental Assessment

The Municipal Class Environmental Assessment (MCEA) is an approved planning and design process developed to ensure the intent of the Ontario *Environmental Assessment Act* (EAA) is met. The MCEA requires project alternatives be assessed, the potential social, economic, and natural environmental effects be identified, mitigation and protection measures be considered, and that the public, agencies, and interest groups be given an opportunity to consult when undertaking certain municipal infrastructure projects.

The MCEA is a Class EA process that has been developed to apply the requirements of the EAA to a group or "class" of municipal projects that are similar in nature, have common characteristics, are frequently reoccurring, have a limited scale, and generally have a predictable range of environmental effects for which mitigation measures can be applied. Projects that do not display these characteristics would not be able to use the planning process and design of the Class EA and must undergo an individual environmental assessment.

The Class EA process is self-directed, whereby municipalities following the process meet the requirements of the EAA. Since projects undertaken by municipalities vary in their environmental impact, they are further classified within the Class EA in terms of Schedules.

- ***Schedule A*** projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the Class EA planning process. Schedule A projects generally include normal or emergency operational and maintenance activities;
- ***Schedule A+*** projects are pre-approved, however, the public is to be advised prior to project implementation. The manner, in which the public is advised, is determined by the proponent;
- ***Schedule B*** projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process, involving mandatory contact with directly affected public and relevant review agencies, to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation. Schedule B projects generally include improvements and minor expansions to existing facilities; and
- ***Schedule C*** projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. Schedule C projects require that an Environmental Study Report be prepared and filed for public and agency review. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities.

### 2.1.1 Master Plans

While the MCEA process addresses the planning and design process by which municipalities may plan municipal works on a project by project basis, it is recognized that in many cases it is beneficial to begin the planning process by

considering a group of related projects, or an overall system. By planning this way, the need and justification for individual projects and the associated broader context are better defined.

Master Plans are long range plans that integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. At a minimum Master Plans address Phases 1 and 2 of the Municipal Class EA process.

The P/W Retrofit Study was undertaken as a Master Plan in accordance with Approach #1 of the Municipal Class EA process. Existing conditions were described, problems, opportunities and a range of solutions were identified, and the various solutions evaluated to arrive at a preferred approach, the recommended Retrofit Plan. Public consultation requirements of the MCEA were also fulfilled as part of the P/W Retrofit Study.

As a Master Plan, the P/W Retrofit Study was completed at a broad level of assessment. More detailed investigations will be required in order to fulfil the MCEA requirements for Schedule B and C projects identified within the recommended Retrofit Plan, including this SWMP project.

### 2.1.2 Class EA Schedule Determination

This Class EA builds upon the work completed in the P/W Retrofit study, taking into account additional project specific considerations as well as preliminary identification of federal areas of interest, permit requirements and potential concern. The intent of this study is to verify the previous findings and meet the Class EA requirements.

This project is a **Schedule B** Class EA based on the following criteria:

- Establish new stormwater retention/detention ponds and appurtenances or infiltration systems including outfall to receiving water body where additional property is required.

Figure 2-1 schematically shows the Class EA Planning and Design Process for Schedule B Municipal Projects.

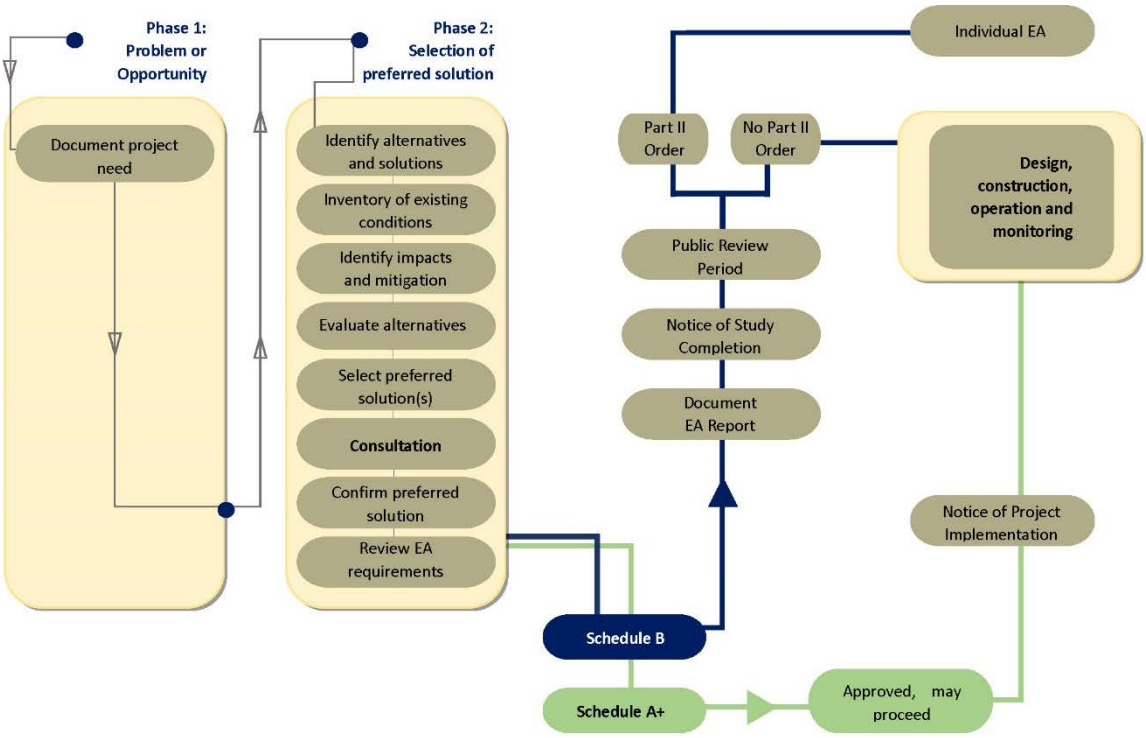



**Figure 2-1: Municipal Class Environmental Assessment Planning and Design Process for Schedule B Projects**

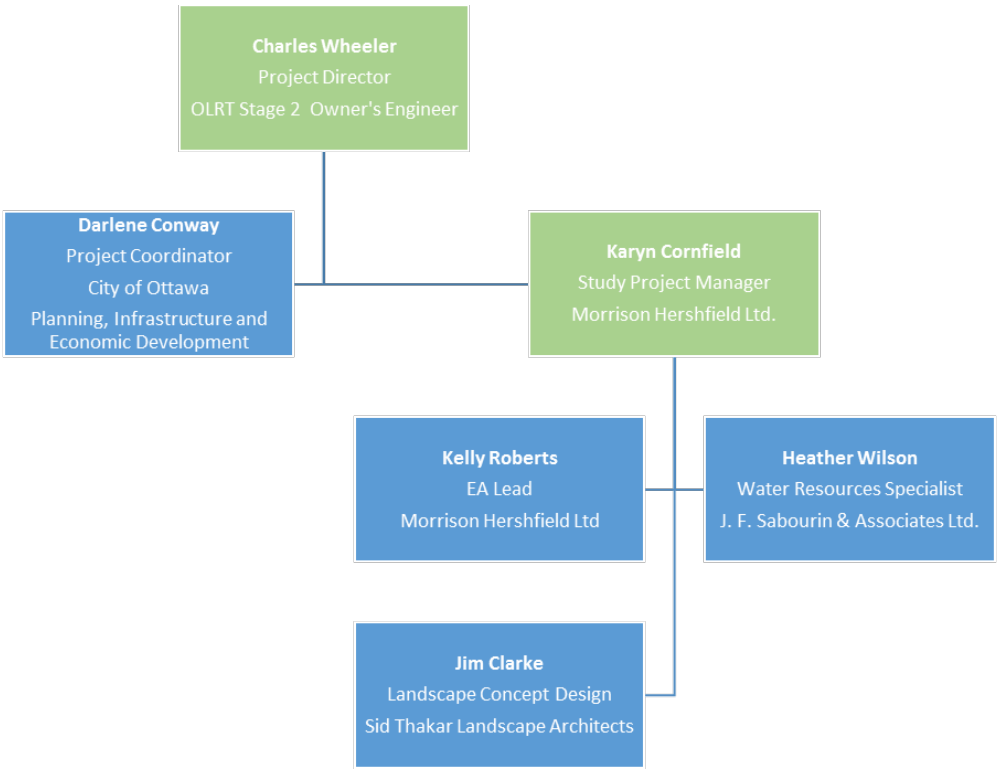
## 2.2 Canadian Environmental Assessment Act (CEAA)

Under the CEAA 2012, a federal environmental assessment must be completed if the project is listed in the *Regulation Designating Physical Activities* or if there is a ministerial order. The Baseline/Woodroffe SWMP is not a project that is listed as a designated project nor has there been a ministerial order. As such, a federal EA is not required. However, a federal authority must not exercise any power or perform any duty or function conferred on it that could permit a project to be carried out, in whole or in part, on federal lands, unless the authority determines that carrying out of the project is not likely to cause significant adverse environmental effects.

The NCC must ensure compliance with the *Canadian Environmental Assessment Act* which requires an environmental determination for projects or activities by federal authorities. As the SWMP will be located on NCC lands, a Federal Land Use and Design and Transaction Approval will also be required.

## 2.3 Project Organization

Morrison Hershfield Limited (MHL) was retained by the City of Ottawa as the lead consultant for the Baseline Woodroffe Stormwater Management Pond Class EA, and teamed with J.F. Sabourin and Associates Inc. (JFSA) and Sid Thakar Landscape Architects (STLA). The Class EA is a City-led project, and is being scheduled in accordance with the Western LRT (Stage 2) preliminary engineering schedule. The organization of the team is outlined below:




The multidisciplinary team was assembled to provide expertise in stormwater management, drainage, environmental planning, hydrogeology, and watershed management, particularly as they relate to Pinecrest Creek and its subwatershed.

The EA has been conducted concurrently and in conjunction with a Cumulative Impacts Study (CIS) for Pinecrest Creek, under the same project management structure shown above. The SWMP is one of the impacts being assessed by the CIS, among other City-led and future development projects that may impact Pinecrest Creek.

## 2.4 Consultation

A key component of the EA process is the coordination and integration of consultation. The planning and coordination of the infrastructure and environmental mitigation requirements for the project, in consultation with the community, stakeholders and review agencies, helps to ensure that the objectives of the City and those consulted are fulfilled.

The purpose of the consultation was to:

- Provide background information on the identification of the problem / opportunity and alternative solutions as identified in the Master Plan;
- Allow stakeholders an opportunity to review potential environmental impacts with stakeholders; and
- Solicit comments regarding the selection of a preferred solution.

Certain elements of the EA study process, including stakeholder consultation, were combined with the CIS. The collaborative study process encompassed a range of stakeholders from both studies. The contact list of potentially affected stakeholder groups and individuals was maintained throughout the study and updated for completeness and

accuracy as required. This list includes government agencies, First Nation representatives, utility companies, public interest groups, and property owners/tenants who may be directly or indirectly affected by the project.

### 2.4.1 Technical Advisory Committee

A Technical Advisory Committee (TAC), consisting of City and agency staff involved with the Pinecrest Creek CIS and SWMP Class EA, was consulted to obtain input and guidance on the direction of the work.

- The initial TAC meeting introduced the CIS and the EA and presented the overall objectives and schedule for input
- The subsequent TAC meetings and stakeholder meetings were held to discuss key aspects of the CIS and design decisions.

The TAC was comprised of representatives of the following organizations:

- Core Project Team Members;
- National Capital Commission (NCC);
- Ontario Ministry of the Environment and Climate Change (MOECC);
- City of Ottawa Departments, as required; and
- Rideau Valley Conservation Authority (RVCA).

### 2.4.2 Public

Various forms of communication were used throughout the study.The public was notified of opportunities for input via the City of Ottawa website, newspaper ads, an online consultation and a subsequent public meeting. Further details regarding the public consultation undertaken are provided in Chapter 7.

### 2.4.3 Government Agencies

Although not part of the TAC, the Ministry of Natural Resources and Forestry (MNRF) was contacted for site specific existing conditions information related to the Study Area. MNRF was previously contacted for information as it related to existing conditions within the broader Stage 2 Ottawa LRT project Study Area, which included the SWMP Study Area. The requests for information and response to date are included in Appendix C.

The Department of Fisheries and Oceans (DFO) will be contacted regarding permitting requirements at the detailed design stage.

### 2.4.4 Aboriginal Communities

First Nations consultation is an important component of the Class EA process. As part of this project the following First Nations were contacted to provide information on the project and provide opportunities for input:

- Algonquins of Ontario (AOO);
- Algonquins of Pikwàkanagàn;
- Kitigan Zibi Anishinabeg; and
- Métis National in Ontario.

Both Kitigan Zibi Anishinabeg and Algonquins of Pikwakanagan First Nation will be contacted for the co-management of archaeological resources, during subsequent investigations in accordance with their protocol. The AOO will be given the opportunity to participate in the investigations. The two communities and AOO will be informed of the proposed archaeological assessment and will be provided a copy of the final archaeological report. Correspondences with Aboriginal Communities to date are provided in Appendix D.

# 3. PROBLEM OR OPPORTUNITY

## 3.1 Project Opportunity and Justification

The introductory section of this Report identified several studies previously undertaken to determine how SWM measures could be implemented in the Pinecrest Creek subwatershed. The studies were conducted to address the lack of SWM within this highly urbanized subwatershed and the resultant conditions in Pinecrest Creek which include degraded water quality, increased erosion, and increased risk of flooding along Pinecrest Creek.

The SWM facility has also been suggested as a “trade-off” to provide off-site water quantity control for a much larger area upstream vs. on-site control for works at Baseline station/the Southwest Transitway. A Feasibility Study (2015) followed the completion of the P/W Retrofit Study (2011) which developed and presented two conceptual design options for the SWM facility, both of which contribute to meeting stormwater management goals for the subwatershed and provide a quantity control solution for the Baseline station/Southwest Transitway works.

A portion of the Confederation West OLRT line is planned to be constructed within NCC lands adjacent to Pinecrest Creek. Baseline station and the runningway approaching the station associated with the OLRT, as well as the extension of the Southwest Transitway BRT will make use of an existing (but as yet uncommissioned) storm sewer outfall to Pinecrest Creek (located north of Baseline Road). These projects are contributing factors that need to be considered within the conclusions and recommendations of the CIS, and the construction of the planned Baseline/Woodroffe SWMP. Implementation of the proposed SWMP is planned to occur in conjunction with the commissioning of the new outfall for Baseline station.

# 4. STUDY AREA AND EXISTING CONDITIONS

This section of the report documents the studies and investigations undertaken to date on the existing natural and social conditions within the Study Area. It is intended to document the baseline conditions of the area against which the potential environmental effects of the alternatives can be assessed. Overall, the baseline data was collected and analysed for key environmental parameters in order to:

- Provide an understanding of existing conditions;
- Allow for future predictions of how the proposed project may cause these environmental conditions to change;
- Allow for future predictions of how adverse effects can be mitigated and beneficial effects enhanced; and
- Provide a basis for designing monitoring programs.

Investigations were not necessarily confined to the boundary of the Study Area, as some environmental elements extend into adjacent areas. Investigations were conducted in areas that provided an appropriately comprehensive perspective of features in and around the limits of the Study Area.

## 4.1 Study Area

The general Study Area (Figure 4-1) is at the north-east corner of the Baseline Road and Woodroffe Avenue intersection, extending north to Iris Street and is approximately 16 hectares in size. Pinecrest Creek enters the Study Area from a culvert under Baseline Road, flows west, and exits through culverts under Woodroffe Avenue.


**Figure 4-1: Study Area**

The spatial boundaries of the Study Area may vary depending on the environmental features being investigated in order to: address environmental effects and operational issues; accommodate coordination with relevant on-going studies and projects; and to identify infrastructure needs and future connections.

## 4.2 Planning Context

Land use planning is a provincial jurisdiction under the Canadian constitution. Federal jurisdiction in this regard only extends to those properties owned by the Government of Canada. The City of Ottawa's Official Plan (OP) and Transportation Master Plan are the primary planning documents for urban, rural and transportation planning in Ottawa.

### 4.2.1 Federal

#### 4.2.1.1 Plan for Canada's Capital, 1999

Although under review, the 1999 Plan for Canada's Capital (PFCC) is the federal government's lead policy statement on the physical planning and development of the National Capital Region (or the Capital) over the next fifty years. The key directions proposed in this document include but are not limited to:

- Enhancement and protection of the region's ecosystems and its green image through the designation of a system of natural heritage areas, and protection of valued ecosystem components; and
- The preservation and conservation of the Capital's cultural and natural landscapes, and historical and archaeological resources of Capital interest.

Polices as they relate to Capital Waterways and Shore Lands include but are not limited to:

- Plan and manage Capital waterways to protect their environmental integrity;
- Work with local and provincial government agencies to adopt contemporary planning and management practices on and off federal lands in dealing with stormwater in order to preserve or enhance surface or ground-water resources to make them safe for aquatic life, recreation and other uses;
- Encourage, with local government and provincial agencies, the prevention or reduction of environmental impacts from flooding or erosion (e.g., community disruption, property damage, damage to archaeological resources); and
- Encourage, with local government and provincial agencies, the prevention or reduction of environmental impacts (e.g., pollution) to Waterways and Shore Lands.

#### 4.2.1.2 Capital Urban Lands Plan, 2015

While the PFCC provides a strategic direction for the Capital Region as a whole, the Capital Urban Lands Plan (CULP) applies to federal lands

inside the Greenbelt on the Ontario side of the Ottawa River. The CULP provides detailed direction and guidance for the use and stewardship of federal lands for which the NCC has jurisdiction pursuant to the National Capital Act.

The CULP is a land-use plan providing detailed policy guidance to support the planning and stewardship of the Capital's Urban Lands. The lands encompassing the Study Area are categorized as "Parkland and Greenspace" in the CULP.

The CULP notes that one of the key roles to achieve the mission statement is to "Support the Capital's Urban Green and Blue Space Network" and to, "Contribute to the building of a liveable Capital Region".

The pathway traversing the Study Area is a NCC Recreational Pathway. The CULP notes that varied use of the Capital Pathway Network is encouraged. Authorized uses are to be compatible with the nature and character of each portion of the network. Any development along the pathway edges will comply with the general policies related to sustainable development and design quality, as well as to protect ecologically sensitive areas.

Within the CULP, the NCC has policies specific to Lighting, Urban Tree Protection, and Siting of Public Infrastructure on NCC Property. Specific policies relevant to this project include but are not limited to:

- Proponents must prove that the use of NCC lands is the only reasonably feasible option and that there is no alternative on municipal or private lands;
- Minimize impacts on the landscape, views, visual quality and site ecology by integrating these factors into the analysis of routing options;
- Consider future impacts related to site access for maintenance purposes upon the review of proposals;
- Prohibit, as a general rule, stormwater management facilities (e.g., ponds, surface/subsurface storage, engineered wetlands) serving adjacent nonfederal land-uses on federal property;
- Emphasize lot level approaches that implement modern stormwater management techniques;
- Under exceptional circumstances, where there is no reasonably feasible alternative, and where such a facility would not compromise the Capital function(s) of the site in question, the NCC may authorize a Stormwater Management Facility on a case-specific basis. The following represent appropriate justifications for such a decision:
    - A proposal resulting from a comprehensive stormwater management retrofit study that employs a significant focus on opportunities for lot level, source control measures (applies where an older urban community was constructed without modern SWM infrastructure);

    - A proposed Stormwater Management Facility would improve water quality and significantly lower fluvial risks for a receiving watercourse; and
    - A proposed Stormwater Management Facility could be designed to serve as a recreational, landscape, and ecological amenity.
- If authorized under exceptional circumstances, a proponent must demonstrate that the proposed Stormwater Management Facility and all related infrastructure exceed current standards and incorporate best practices;
- Require proponents of significant undertakings on federal land to provide a SWM report prepared by a qualified engineer. The report shall identify the low-impact, best practice measures required to meet or exceed the applicable regulatory standards for SWM;
- Limit uncontrolled surface drainage in urbanized locations to the extent possible by encouraging the implementation of best practices such as reducing impervious surface area, the integration of stormwater infiltration areas and/or storage basins, and the installation of water quality control devices (e.g., oil and grit separators, etc.), where appropriate;
- Consider actions to enhance watercourse health where subwatershed studies have provided recommendations for improvement;
- Assess and manage the cumulative impacts of stormwater and associated management practices, including the mitigation of hydrological, geotechnical and fluvial geomorphology risks. This approach will involve the use of best management practices (BMP) in the design, development and management of stormwater networks; and
- Prioritize actions that:
    - Limit the introduction of effluents and other substances that cause water quality deterioration;
    - Reduce the risk of shoreline erosion and landslides;
    - Reduce sediment loading caused by uncontrolled runoff;
    - Promote a more naturalized hydrological function for watercourses;
    - Normalize hydrological flow during wet weather for upstream watercourses (e.g., Watts Creek, Leamy Creek, Pinecrest Creek);
    - Enhance a waterway's contribution to ecosystem health through the implementation of engineered and naturalized elements; and

Promote lot level best practices for SWM.

#### 4.2.1.3 Species at Risk Act, 2002

The purposes of the Species at Risk Act (SARA), 2002 are to prevent wildlife species from being extirpated or becoming extinct; to provide

for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; and to manage species of special concern to prevent them from becoming endangered or threatened.

Section 32 (1) of the Act states that "no person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species." Section 32 (2) makes further provisions for possession and collection of species and states that "no person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part or derivative of such an individual."

Section 33 of the Act speaks to the protection of species habitat and states that "no person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada."

According to Section 34 of the Act, any individuals of a listed wildlife species that are not an aquatic species or a species of bird that are migratory birds protected by the Migratory Birds Convention Act, 1994, Sections 32 and 33 do not apply in lands in a province that are not federal lands unless an order is made under Subsection (2) to provide that they apply.

As the Study Area is located on Federal Lands (owned by the NCC), SARA, 2002 is applicable to this project.

#### 4.2.1.4 Ottawa MacDonald-Cartier International Airport Zoning Regulations

As outlined in Item 6 "No owner or lessee of land within the limits of the bird hazard zone shall permit any part of that land to be used for activities or uses attracting birds that create a hazard to aviation safety."

The goal of wildlife control on and near an airport is to reduce the risk of an aircraft accident caused by birds and other forms of wildlife (Transport Canada, 2012). The bird hazard risk-assessment process contributes to this goal by describing categories of land-use in the vicinity of the airport in terms of the relative risk of bird strikes to aircraft. The risk-assessment process evaluates the relationship among land-use, bird species and aircraft movements in terms of relative risk to aircraft.

High-risk aircraft flight paths are developed and superimposed over maps of the local area (Figure 4-2).

SWMPs that permanently hold water can attract waterfowl, including Canada Geese and gulls, and present a “potentially moderate” hazard which are not acceptable in Primary Hazard Zones but are acceptable in Secondary and Special Hazard Zones (Transport Canada, 2012). However, it is important to note that risks associated with many land uses can be reduced through appropriate mitigation and monitoring.

As illustrated in Figure 4-2, the proposed SWMP is within the Approach Bird Hazard Zone for the Ottawa International Airport. Using the analysis of the hazardous land-uses as summarized above, the appropriateness of land-use within bird hazard zones and its impacts will be determined in consultation with Transport Canada (sections 8.1.3 and 9).

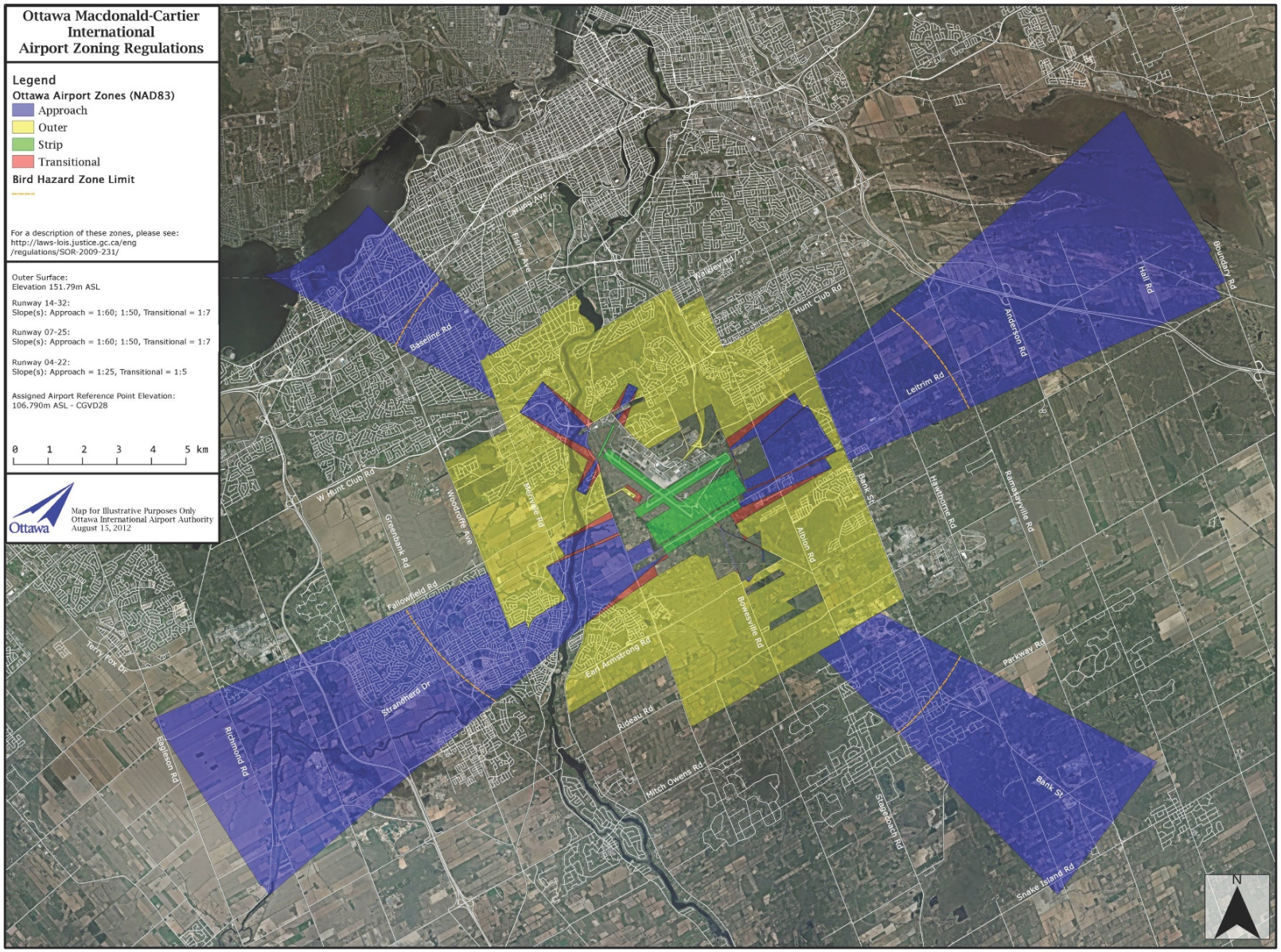



**Figure 4-2: Ottawa Airport Bird Hazard Zone Limit (Ottawa International Airport Authority)**

### 4.2.2 Provincial

#### 4.2.2.1 Provincial Policy Statement, 2014

Section 2.2.1 of the 2014 Ontario Provincial Policy Statement (PPS) describes the protection, improvement, and restoration of the quality and quantity of water. It stresses identifying water resource systems and maintaining their linkages and functions, including surface water features, which are necessary for the ecological and hydrological integrity of the watershed. It also aims to ensure that SWM practices minimize stormwater volumes and contaminant loads, as well as maintain and increase the extent of vegetative and pervious surfaces.

Section 1.6.6.7 of the PPS outlines the intentions of planning for SWM, and includes minimizing changes in water balance and erosion, having no net increase of risks to human health, safety, and property, and promoting SWM best practices.

#### 4.2.2.2 Ontario Endangered Species Act, 2007

The Ontario Endangered Species Act (OESA), 2007 provides legal protection for endangered, threatened and extirpated species. The purpose of the OESA is to identify Species at Risk (SAR) based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge. Additionally, the Act serves to protect species that are at risk and their habitats; promote the recovery of species that are at risk; and promotes stewardship activities to assist in their protection and recovery.

Section 9 (1) of the OESA states that “No person shall kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario as an extirpated, endangered, or threatened species”. Section 10 (1) of the OESA clearly states that no person shall damage or destroy the habitat of a species that is listed on the SAR in Ontario List as an endangered or threatened species”. The MNRF may issue a permit to a person that, with respect to a species specified in the permit, is on the Ontario SAR list as an extirpated, endangered, threatened species, which authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by Section 9 or 10 of the Act.

### 4.2.3 Regional

#### 4.2.3.1 Source Water Protection Area

The Study Area is located in the Mississippi-Rideau Source Water Protection Region and within an Intake Protection Zone for the City’s Britannia Water Treatment Plant intake. The Plan includes policies regarding SWM ponds in significant drinking water threat areas which are defined and identified in the Plan. The size of the proposed pond's

drainage area and predominant land use would classify the pond as not being a significant threat. The City's Source Water Protection Risk Management staff were consulted regarding the current source water protection policies and requirements and how they may apply to a new SWM pond proposed as SWM retrofit and no concerns were identified.

### 4.2.4 Municipal

#### 4.2.4.1 City of Ottawa Official Plan, 2003 as Amended

The City of Ottawa Official Plan Amendment (OPA) #150 was approved by the Minister of Municipal Affairs and Housing in April 2014. Appeals to all and parts of the OPA#150 were received. In considering the appeals of the whole of the Amendment the Ontario Municipal Board determined that the City needed to complete additional reviews related to Employment Areas, the Agricultural Resource Area and the planning timeframe of the Official Plan. Although the track-changes version of the Official Plan is available online, and was used as reference, OPA#150 has not yet been finalized, and as such the 2003 Official Plan (as amended) has been referenced within this EA, unless otherwise noted.

The City of Ottawa is committed to planning on both watershed and subwatershed levels. The requirement for watershed plans, subwatershed plans, and environmental management plans is intended to ensure that appropriate planning for stormwater is undertaken.

- Section 2.3.3 of the OP requires stormwater retrofit planning to address the cumulative impacts of infill and redevelopment in areas of the City that were developed without SWM; and
- Section 4.7.6 requires that in areas of intensification, new development or redevelopment will be encouraged to incorporate on-site SWM and/or retention measures.

#### 4.2.4.2 Greenspace Master Plan – Strategies for Ottawa's Urban Greenspaces, 2006

The purpose of the *Greenspace Master Plan - Strategies for Ottawa's Urban Greenspaces* (2006) is to identify policy on greenspace in the urban area of the City. The Greenspace Master Plan (GMP) describes the lands that can be considered as greenspace and sets strategic directions for managing and extending this supply in order to achieve the community's vision for greenspace. In its simplest form, greenspace is considered in this Plan to be land that serves one of two purposes:

- Provision of recreation and leisure opportunities for the use and benefit of the public; and
- Preservation of the natural environment and environmental systems.

Open space and leisure land can be created in a variety of landscapes and requires human intervention to maintain it for recreational use. Land containing pathways and trails provide for informal relaxation and serve other social and community purposes. As open lands, they contribute to hydrological functions. The public has full access to this land, which in most cases is publicly owned.

The facilities and corridors used for major infrastructure, such as stormwater management ponds, also provide opportunity for greenspaces for recreational use and wildlife movement. Depending on its location, the corridor can provide links for animal movement, plant dispersion, and pathways for walking and cycling. These lands are primarily in government, public and private agency or corporate ownership, and where they are developed and secured for public access, they are included in the plan's assessment of greenspace.

Section 4.1.1 of the GMP notes that the City will design stormwater ponds and utility corridors in such a way that they can also function as greenspace in new communities and redevelopment areas, and will incorporate hazard lands in the overall greenspace plan. These lands will not be considered as part of the public dedication required under the Planning Act, although adjacent, developable lands proposed for paths or parks may be purchased or included in the public dedication.

Section 4.1.3 of the GMP notes that the City will seek opportunities to develop a connected Urban Greenspace Network through the design and location of major infrastructure by designing and locating SWMP so that they contribute to or enhance natural systems within the urban area and form connections with other greenspaces in the community, where feasible and appropriate.

#### 4.2.4.3 City of Ottawa Infrastructure Master Plan, 2013

The purpose of the City of Ottawa's Infrastructure Master Plan (IMP), 2013, is to support the City's OP goals of creating more vibrant, healthy and complete neighbourhoods across the municipality while ensuring long-term affordability for both the City government and residents. Efficient management, responsible operation and judiciously targeted growth of water, wastewater, and stormwater infrastructure play a major role in the pursuit of these goals. The IMP supports the OP by ensuring there is enough infrastructure capacity in the right areas of the municipality. Service levels and timing need to be right to accommodate development and redevelopment until 2031 when the City of Ottawa population is expected to reach 1.14 million.

Section 4.5.3 of the IMP notes that the current Level-of-Service (LOS), provided in areas of the City developed within the last 20 to 30 years, require that storm drainage collection and treatment systems safely convey runoff from both frequent and more extreme events to the nearest watercourse while mitigating the impacts of urbanization on these receivers (flooding, erosion, impaired water quality).

As existing storm sewers reach the end of their life cycle, it is City policy to upgrade to the current LOS where feasible. Flood remediation studies in older areas strive to retrofit dual drainage systems to the extent possible, improving the existing LOS. With respect to receiving watercourses, the City has also started to identify SWM retrofit opportunities in older areas by completing retrofit studies of predominately urban subwatersheds.

As indicated in Section 5.4.1 of the 2013 IMP, the City owns and operates a multitude of decentralized SWM and drainage systems comprised of collection systems, outlet structures, storage and treatment facilities, and a limited number of small stormwater pumping stations. Finally, the stormwater systems also include the local receiving watercourses into which all runoff is eventually discharged. The collection systems capture and convey stormwater runoff. These systems include over 2,600 km of storm sewers and more than 2,500 km of ditches (within the urban and rural areas), as well as approximately 100,500 catchbasins and 51,000 storm sewer maintenance holes.

River and stream corridors form an essential part of the City's drainage systems, eventually receiving and conveying all runoff. Various types of infrastructure are also located within river and stream corridors such as utility crossings, pathways, bridges, sewers, storm outfalls and retaining walls. The stability of river and stream corridors has a direct bearing on the continued operation of the City's drainage systems as well as the condition of infrastructure located within those corridors.

SWM retrofit refers to the insertion of various measures into established, older communities that were originally built without the infrastructure needed to mitigate the impacts of uncontrolled runoff. These impacts include degraded water quality, increased flooding and erosion, and the impairment or destruction of fish habitat. Unlike greenfield development, where SWM measures are incorporated as a matter of course, the challenge of SWM retrofit is to identify effective measures that can be implemented after the fact, when there is limited land available to implement conventional SWM facilities. As noted in the IMP, the City will identify and incorporate stormwater management retrofit measures into City renewal projects where appropriate.

#### 4.2.4.4 City of Ottawa – Ottawa River Action Plan, 2010

The health of the Ottawa River is a priority of the City of Ottawa. Protecting the Ottawa River means maintaining a healthy aquatic ecosystem; ensuring compliance with regulatory requirements; optimizing recreational use and reducing beach closures; and developing a long-term strategy to guide and prioritize actions.

The City is working to reduce the impact of both combined sewage overflows and stormwater on the Ottawa River. The ORAP consists of

17 individual projects aimed at enhancing the health of the Ottawa River and protecting Ottawa's water environment for future generations.

The P/W SWM Retrofit Study is one of the 17 ORAP projects. It defines a long-term plan to improve the health of Pinecrest Creek and the local reach of the Ottawa River, reduce flooding and erosion, and reduce closures at Westboro Beach.

## 4.3 Bio-Physical Environment

Background information regarding biological and physical components that are exhibited within the Study Area and/or may be affected by the proposed project has been collected and is described below. The following are not found within 1000 m of the Study Area, and therefore have not been considered further:

- Wetlands (including provincially significant wetlands);
- Areas of Natural and Scientific Interest (ANSI); or
- Areas subject to Aboriginal Land Claims.

### 4.3.1 Subsurface Conditions

In 2015, Golder Associates completed a geotechnical investigation as part of the Feasibility Study (JFSA, 2015). The field work for the geotechnical investigation was carried out in June and July of 2012, where four (4) boreholes and two (2) probeholes were drilled. Monitoring wells were installed at three (3) of the boreholes for groundwater level measurements and hydraulic testing. Unless otherwise indicated, the information discussed below was gathered as part of the Feasibility Study.

In 2017, Morrison Hershfield completed a Phase II Environmental Site Assessment (ESA), where two (2) geo-environmental boreholes were drilled, equipped with monitoring wells.

#### 4.3.1.1 Bedrock

The City of Ottawa GIS database indicates that the bedrock underlying the Study Area is of the Gull River and Rockcliffe Formations (Figure 4-3). The Gull River Formation consists of interbedded silty dolostone, lithographic to fine crystalline limestone, and oolitic limestone. The Rockcliffe formation makes up the majority of the Study Area, and consists of quartz sandstone, shaley limestone, and shale.

The geotechnical investigation from the Feasibility Study inferred that the bedrock surface is at a depth of about 8.2 to 9.3 m below ground surface (mbgs), after auger refusal occurred at depths of about 8.2, 9.3, and 8.8 mbgs closest to Pinecrest Creek. Auger refusal likely indicates the bedrock surface but could also occur on cobbles or boulders in the glacial till.

#### 4.3.1.2 Surficial Geology

The bedrock is immediately overlain with glacial till, followed by silty clay, silty sand and sandy silt, and finally with topsoil at the ground's surface, approximately 200 to 460 mm thick. Glacial till was encountered beneath the silty clay at three (3) boreholes in the southern half of the site and proven to depths of about 8.2 to 10.4 m.

The till is a heterogeneous mixture of gravel, cobbles, and boulders in a matrix of sandy silt or silty sand with a trace to some clay. Testing indicated that the till is compact to very densely packed, alternatively the results may be due to the cobbles and boulders in the deposit, or the borehole encountering the bedrock surface, rather than due to the packing.

Topsoil was found at ground surface at all of the borehole locations at a thickness ranging from approximately 20 to 46 cm. The topsoil is underlain by deposits of either silty sand or sandy silt, with silty clay seams. The thickness of these deposits ranges from about 0.5 to 1.5 m. The silty sand and sandy silt are underlain by a deposit of silty clay. The top 2.4 to 4.3 m of the silty clay have been weathered to a grey brown crust of very stiff to stiff consistency with intermediate plasticity.

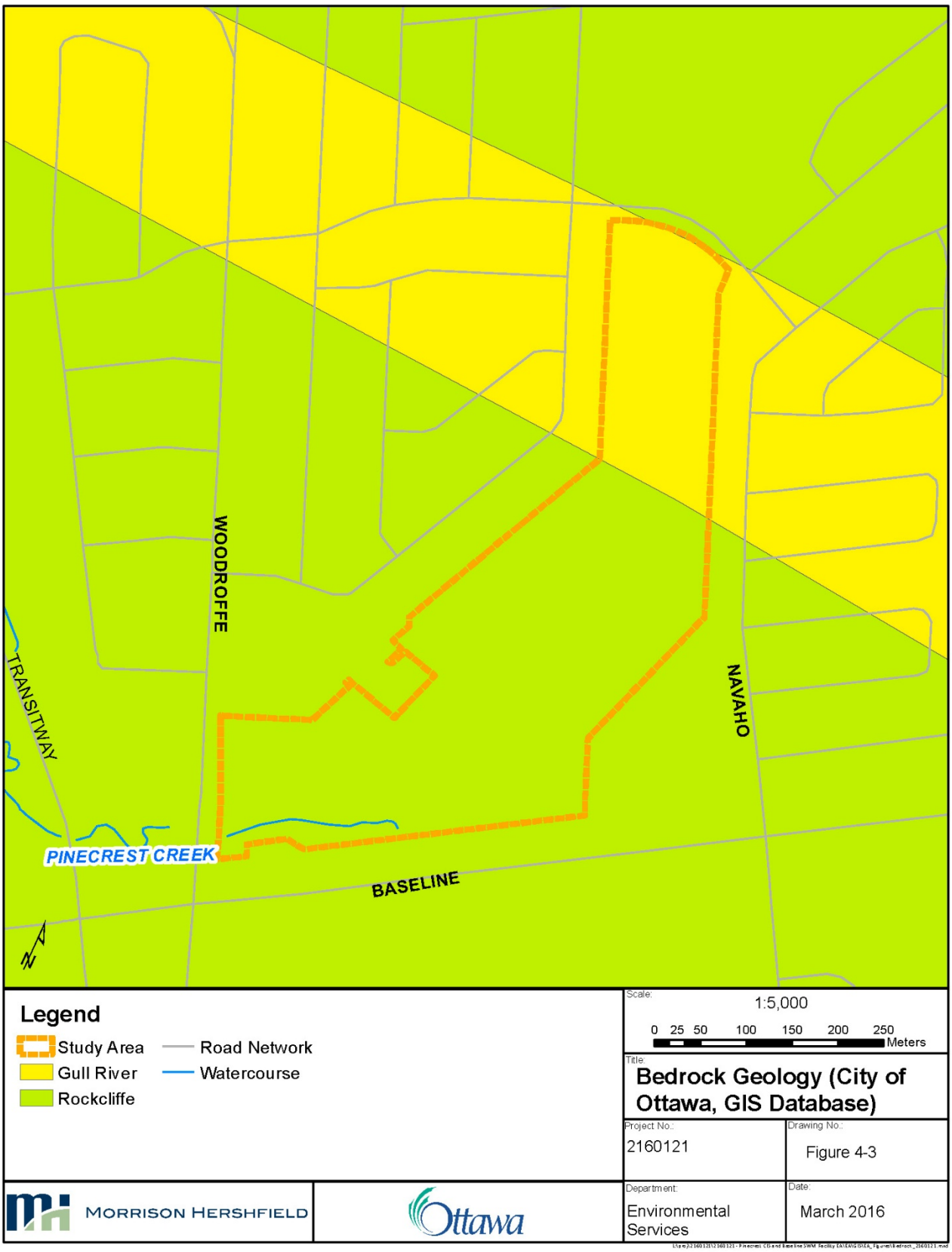



**Figure 4-3: Bedrock Geology (City of Ottawa, GIS Database)**

The unweathered silty clay was fully penetrated to depths between 6.9 and 9.8 mbgs at the three (3) boreholes in the southern half of the site, and proven to a depth of about 8.7 m in the borehole further north in the site. The silty clay below the depth of weathering is grey in colour and was found to be of firm to stiff consistency and intermediate plasticity.

### 4.3.2 Groundwater

Table 4-1 highlights the results of the groundwater level measurements (July 5, 2012) and the hydraulic conductivity testing on the monitoring wells, which were installed in three (3) boreholes in the southern half of the site. It is important to note that groundwater levels are expected to fluctuate seasonally and in response to weather conditions.

**Table 4-1: Groundwater Level Measurements**

| **Borehole Number** | 12-1 | 12-2 | 12-3 |
|---|---|---|---|
| **Geological Unit** | Glacial Till | Unweathered Silty Clay | Unweathered Silty Clay |
| **Ground Surface Elevation (m)** | 84.45 | 84.77 | 85.37 |
| **Water Level Depth (m)** | 5.39 | 3.04 | 3.56 |
| **Water Level Elevation (m)** | 79.06 | 81.73 | 81.81 |
| **Calculated Hydraulic Conductivity (cm/sec)** | $1.7x10^{-5}$ | $3.3x10^{-5}$ | $1.5x10^{-5}$ |

The results of the hydraulic conductivity testing indicate that both the unweathered silty clay and glacial till are relatively low permeability soils. Although the silty clay is a much finer grained soil than the glacial till, and would therefore be expected to have a lower hydraulic conductivity, the relative similarity in the measured hydraulic conductivity values may reflect the presence of fissuring in the clay, which is not uncommon. The groundwater levels also indicate a potential hydraulic gradient from the silty clay towards the glacial till.

### 4.3.3 Environmental Contamination Potential

*The City of Ottawa Historic Land Use Inventory (HLUI) Database* indicates past and/or present land uses that may increase the likelihood of environmental contamination within the City of Ottawa. This database, however, may not include reference to federal lands. It indicates that land uses such as Laundries and Cleaners and Gas Service Stations are immediately adjacent to the Study Area.

#### 4.3.3.1 Phase I Environmental Site Assessment

At the request of the NCC, Trow Associates completed a Phase I ESA for the site (Property Asset 95594) in 2006 (Trow, 2006). The Phase I ESA indicates that the Study Area has been recreational vacant land since the 1950's, prior to which it was occupied by a farmhouse, barns and associated farmland. A site visit and records review did not indicate any contamination or significant environmental concerns on the site. Although land use to the immediate south of the Study Area was historically gasoline service stations, it was concluded in the Phase I ESA that the potential for adverse impacts to the Study Area is considered low.

The Phase I ESA also indicated that a hydro transformer substation is adjacent to the Study Area in the south west, with evidence of significant staining on the gravel surface within the station and to within 3-4 m of the site boundary. Given that staining is in close proximity to the site boundary of NCC Property Asset 95594 (Study Area) a recommendation was made for further investigation. An Enhanced Phase I ESA completed for the adjacent NCC Property Asset 585 reiterates this recommendation (Trow, 2008).

#### 4.3.3.2 Phase II Environmental Site Assessment

Morrison Hershfield completed a Phase II ESA for the site, which is attached in Appendix E. The ESA considered groundwater and soil contamination potential based on previously identified uses.

Polycyclic aromatic hydrocarbons (PAH), petroleum hydrocarbons (PHC), volatile organic compounds (VOC) and polychlorinated biphenyls (PCB) impacts are not present in the soil or groundwater. In fact, all contaminants within these parameter suites had non-detectable concentrations in both soil and groundwater, except for chloroform, which was present in the groundwater from BWP-1, but at a concentration below MOECC Table 3. Arsenic and chromium were also detected in groundwater from BWP-1 at concentrations above Canadian Council of Ministers of the Environment (CCME) Site Condition Standards, but below MOECC and the City of Ottawa Site Condition Standards. All other dissolved metals which were detected in groundwater were at concentrations below CCME, MOECC, and the City of Ottawa Site Condition Standards. These analytical results coupled with the low to non-existent soil headspace organic vapour readings and lack of field evidence of contamination lead to the conclusion that anthropogenic contamination is not present in the samples collected.

In terms of metals in the soil, no metal impacts were detected in the silty sand topsoil, however, MOECC Table 1 and CCME exceedances of barium, chromium and hexavalent chromium were confirmed in the silty clay present at the Site. These elevated metal concentrations are likely naturally occurring as this contaminant profile has been observed

in other fine grained Champlain Sea deposits that form part of the Ottawa Valley Clay Plain physiographic region. (Morrison Hershfield, 2017).

Given that the metals are naturally occurring and prevalent in clay from the Champlain Sea deposit which is widespread across eastern Ontario, there are no special recommendations for handling or re-use of the material on site. The contractor should be made aware of the elevated metals concentrations and should ensure that all excess materials are managed in accordance with environmental laws. There are options for the beneficial reuse of this material at receiving sites.

It should also be noted that the CCME guidelines are subject to professional judgement and require interpretation. For the chromium exceedances of the CCME SCS, it is noted that values derived in the CCME guidelines are based on protection of soil quality for plant growth (nutrient content and metabolism) and mainly apply to agricultural land use. These CCME SCS are not designed for the protection of human health or ecological receptors and are therefore overly conservative for the current and planned property use.

Additionally, an inquiry made to the City of Ottawa regarding potential contamination within the Site identified an active Ministry of Environment and Climate Change (MOECC) Environmental Compliance Approval (ECA) for an Oxygen Injection System on the property located at 1980 Baseline Road, related to a treatment system for PHCs and chlorinated Volatile Organic Compounds (VOCs.) Based on further review of historical photographs, available documents, and site visit carried out on the treatment system, the following was concluded:

- A former retail fuel outlet is apparent on the 1965, 1976, 1991, and 1999 aerial photos on the geo-Ottawa website. Its location is approximately 50 m south of Baseline Road and 90 m east of Woodroffe Avenue, at the northwest corner of the current Loblaws parking lot.

- A treatment system for petroleum hydrocarbons in groundwater has been operational in the location of this former retail fuel outlet under MOECC ECA No. 2914-66JL7Z from November 9, 2014 to June 23, 2016 and under ECA No. 3878-AB7LHZ from June 23, 2016 to present.

- Based on the likely location of the contaminated soil and/or groundwater, on the far side of Pinecrest Creek from the proposed pond and at least 140 m from the closest area where excavation will occur, and based on the fact the neither PHC F1-F4 nor BTEX were detected in the two installed monitoring wells on-site, no further investigation of this issue is required, and it is not expected to have any impact on the construction, maintenance, or operation of the proposed storm pond.

### 4.3.4 Watercourses

#### 4.3.4.1 Ottawa River

The cities of Ottawa and Gatineau are located in the upstream portion of the Carillon to Chaudière reach of the Ottawa River. Haxton and Chubbuck (2002) note that there are at least 47 tributaries in this portion of the Ottawa River (26 in Québec and 21 in Ontario). The main tributaries of this section include Rivière Nord, Rivière Rouge, South Nation River, Rivière Petite Nation, Rivière Lièvre, Rivière Gatineau, and Rideau River Falls.

The Ottawa River is listed in the schedule of the Navigation Protection Act (NPA). According to this Act, it is prohibited to construct, place, alter, repair, rebuild, remove or decommission a work in, on, over, under, through or across any navigable water that is listed in the schedule except in accordance with this Act or any other federal Act.

#### 4.3.4.2 Pinecrest Creek

As described in the 2011 P/W Retrofit Study, Pinecrest Creek is a small highly altered stream within an urbanized subwatershed. As an urban watercourse, Pinecrest Creek has been altered from its natural state both directly and indirectly. The creek and its (former) tributaries have been straightened, buried, realigned and its riparian vegetation has been reduced, modified or removed.

The main channel of Pinecrest Creek is approximately four kilometers long, however, only 2.5 km are open with the remaining length culverted or piped. The culvert and piped sections of the creek include the reaches between West Hunt Club Road and Baseline Road and the reaches from just south of Carling Avenue to immediately upstream of the confluence with the Ottawa River where it emerges at the Sir John A. Macdonald Parkway (SJAMP).

The open creek corridor extends from Baseline Road, through the Study Area to just south of Carling Avenue. This open corridor is part of the green corridors and parklands owned by the NCC.

Pinecrest Creek has not been identified in the Schedules under the Navigation Protection Act. Section 4 (1) of the NPA notes that the owner of a work that is constructed or placed, or proposed to be constructed or placed, in, on, over, under, through or across any navigable water, other than any navigable water that is listed in the schedule, may request that this Act be made applicable to the work as if it were a work that is constructed or placed, or proposed to be constructed or placed, in, on, over, under, through or across any navigable water that is listed in the schedule.

### 4.3.5 Fluvial Geomorphology

Fluvial geomorphic investigations were previously completed for the Feasibility Study (JFSA, 2015). A field component was used to determine the location of sensitive areas along the receiving reach of Pinecrest Creek and to establish the optimal location for discharge of stormwater. A desktop component was used to assess conditions in the creek with respect to varying discharges from the pond and to determine channel parameters which are indicative of erosion potential.

Reach boundaries for Pinecrest Creek are shown in Figure 4-4. The reach used for detailed analysis was Reach 6, as this is the reach within the Study Area limits. Additional analysis was completed on Reach 3. The erosion analysis focused on these reaches, but also included assessment of the entire open channel length of Pinecrest Creek.


*Reach 1:* *Pinecrest Drain to Queensway – 860 m*
*Reach 2:* *Queensway to Iris Street – 275 m*
*Reach 3:* *Iris Street to Transitway Culvert – 406 m*
*Reach 4:* *Transitway Culvert to Transitway Culvert – 260 m*
*Reach 5:* *Transitway Culvert to Woodroffe Avenue – 174 m*
*Reach 6:* *Woodroffe Avenue to Baseline Road – 202 m*

**Figure 4-4: Study Reaches on Pinecrest Creek (Step 1, page 6, JFSA, 2015)**

#### 4.3.5.1 Erosion Assessment

Erosion on Pinecrest Creek is occurring along the upper end of Reach 6 at the location where the gabion basket wall terminates. Limited to the eastern bank, this erosion extends for a distance of approximately 25 m. The eastern bank along this section is composed of bare banks with exposed clay at a steep angle; the bank is subject to sheetwash erosion and some toe erosion. The steepness of the bank limits

vegetation growth. Erosion at this site was characterized as “high severity” in the Feasibility Study (JFSA, 2015).

The remainder of Reach 6 is stable. The creek is confined in a steep valley; however there is a strong connection with a limited floodplain which is well-vegetated and stable. The depth of the valley decreases as distance downstream toward Baseline Road increases, though there is no widening of the base of the valley in which the creek flows. Photo 1 shows the eroding bank; Photo 2 shows the stable section of the reach.

**Photo 1: Eroding east bank downstream of gabion wall (Reach 6). View is looking upstream (JFSA, 2015)**

**Photo 2: View along stable section of Reach 6. View is looking upstream (JFSA, 2015)**

The reach upstream of Iris Street (Reach 3) is relatively stable. Previous unstable sites were rehabilitated in 2008 by the NCC and continue to function as intended. That said, the Feasibility Study (JFSA, 2015) notes that one eroding bank on the west side of the creek (adjacent to the Transitway) is located approximately 90 m upstream of Iris Street, which has been extending for a number of years. This bank is to the point where it is now classified as "high severity" and it will require some intervention in the future.

This site in Reach 3 was used to determine the downstream erosion threshold as it was identified as the most sensitive location downstream of the outlet. It is recognized that pond function may not be a significant contributor at this location due to input distances between the pond and this site.

**Photo 3: Eroding bank in Reach 3 that represents the sensitive reach for threshold analysis. (JFSA, 2015)**

#### 4.3.5.2 Erosion Thresholds

The Feasibility Study (JFSA, 2015) included a detailed analysis of creek response to flow for 20 cross-sections of Pinecrest Creek (19 in Reach 6 one in Reach 3). Grain size analysis was previously completed and remains representative. Four samples were analyzed for each of the two reaches, details of which can be found in the Feasibility Study (JFSA, 2015) and supporting documentation.

Erosion sensitivity is based on a number of factors including the ability of the section to move sediment through the channel. In Reach 6,

Station 5140 was determined to be the most sensitive based on analysis of the channel parameters. This reach was used to establish the erosion threshold used to inform the SWMP release rate.

Erosion thresholds are based on a given fraction of the bed material particle size distribution, which is determined through bulk sediment analysis. Four bed samples were collected and analyzed for each reach as part of the Pinecrest/Centrepointe Stormwater Management Criteria Study (2010).

The sample used to determine threshold discharge in Reach 6 represents the finer of the grain size samples in the Reach and was selected in light of the stormwater criteria to remove a minimum of 60% of total suspended solids (TSS) from collected runoff. If a larger sample fraction were used, then flushing of all fines from the channel would result and subsequent bank erosion would occur.

Based on the geomorphic analysis prepared in the Feasibility Study (JFSA, 2015), the threshold discharge for stormwater release from the proposed pond delivering to Reach 6 is 0.310 $m^3$ $sec^{-1}$.

### 4.3.6 Fish and Aquatic Habitat

#### 4.3.6.1 Ottawa River

The reach of the Ottawa River into which Pinecrest Creek flows supports a relatively diverse coolwater/warmwater fish community comprised of at least 75 different fish species (Haxton and Chubbuck, 2002). Sport species include Walleye, Sauger, Northern Pike, Muskellunge, Yellow Perch, Smallmouth Bass, Largemouth Bass, Sturgeon, and Black Crappie.

Generally the distribution and abundance of fish varies considerably among locations, with the most diverse fish communities are found in the shallow, littoral areas.

#### 4.3.6.2 Pinecrest Creek

Urbanization throughout the Pinecrest Creek subwatershed has degraded the aquatic habitat conditions in the creek. As a result of urbanization, very little of the rainfall is absorbed into permeable surfaces, and runs quickly downstream into the creek. These flows have caused unstable riffle pool sequences, homogenous habitat, as well as channel downcutting into till and bedrock, reducing the number of refuge pools for fish and benthic invertebrates. There are also instream barriers and migratory obstructions such as a 1.5 km enclosure (Ottawa River Parkway pipe) and a triple CSP arch culvert under the SJAM Parkway near the mouth of the creek.

Pinecrest Creek has been heavily impacted by uncontrolled stormwater runoff and associated impairment of water quality. High peak flows and

volumes of runoff have caused instability and a lack of aquatic habitat diversity. The P/W SWM Retrofit Study noted that Pinecrest Creek is one of the most urbanized subwatersheds in the City of Ottawa, with about 36% of the subwatershed being impervious. RVCA surveys found only four fish species in 1993 and one species, White Sucker, in 2011, upstream of the entombed creek (RVCA, 2011). In addition to the enclosed portion of the creek, major road crossings and gabion reinforced banks result in highly altered conditions.

The City Stream Watch 2006 Annual Report (RVCA, 2006) considered only 19 percent of Pinecrest Creek to be in a natural condition and significant alterations are still present in these sections. The City Stream Watch 2011 Summary (RVCA, 2011) considered 31% of the creek natural, but with some anthropogenic changes. The outlet to the Ottawa River is the least disturbed reach of Pinecrest Creek, with a short delta-like wetland (City of Ottawa, 1998). Meandering and bank stability are much better in this reach, with a wider natural riparian zone. In the 2011 RVCA survey, nine fish species were captured at the outlet.

The banks of Pinecrest Creek range in height from 0.5 to 4 m. In 62 percent of sections sampled by the RVCA in 2006, the stream banks along Pinecrest Creek were identified as being unstable or undercut. The 2011 P/W SWM Retrofit Study notes that this has resulted in vegetation loss, poor aquatic habitat and degraded water quality. The NCC has completed several bank and slope stabilization projects along the creek to mitigate on-going erosion and improve the creek's ability to withstand the impacts of uncontrolled runoff. Since the 2006 survey by the RVCA, the bank stability has improved 4 to 8%.

The amount of instream vegetation increased significantly between 2006 and 2011, however it was still found to be 99% algae, which is indicative of high nutrient enrichment.

### 4.3.7 Wetlands and Areas of Natural and Scientific Interest (ANSI)

Natural Heritage in the vicinity of the Study Area consists primarily of urban parks, woodlots adjacent to Pinecrest Creek and wetlands.

Mud Lake Wetland (an evaluated Provincially Significant Wetland (PSW)) is part of the Britannia Conservation Area (ANSI) in proximity to the confluence of Pinecrest Creek and the Ottawa River. There are no PSW or ANSI within 1000 m of the Study Area. There are no wetlands within the Study Area.

### 4.3.8 Natural Terrestrial Vegetation

As part of the 2015 JFSA Feasibility Study, an inventory of the sites' landscape conditions was undertaken by Gruenwoldt/Copeland Associates. This investigation was limited to plant species and vegetation zones. The study was undertaken to better understand the influences on land use including the loss or transition of species and the age of the existing vegetation on the site.

Visually the site retains the characteristics of old farm fields where hay fields have evolved into grassy meadows with woody vegetation seeding in from the surrounding residential developments. The meadows are currently comprised of tall grasses, forbs and seedling woody plants, and there is a large rodent population.

Although subtle, the site can be inventoried as three landscape zones. The zones are identified as: Zone 1) Creek & Channel; Zone 2) Old Fields now described as Meadows; and, Zone 3) Verge along the property lines and the rear of the abutting subdivisions.

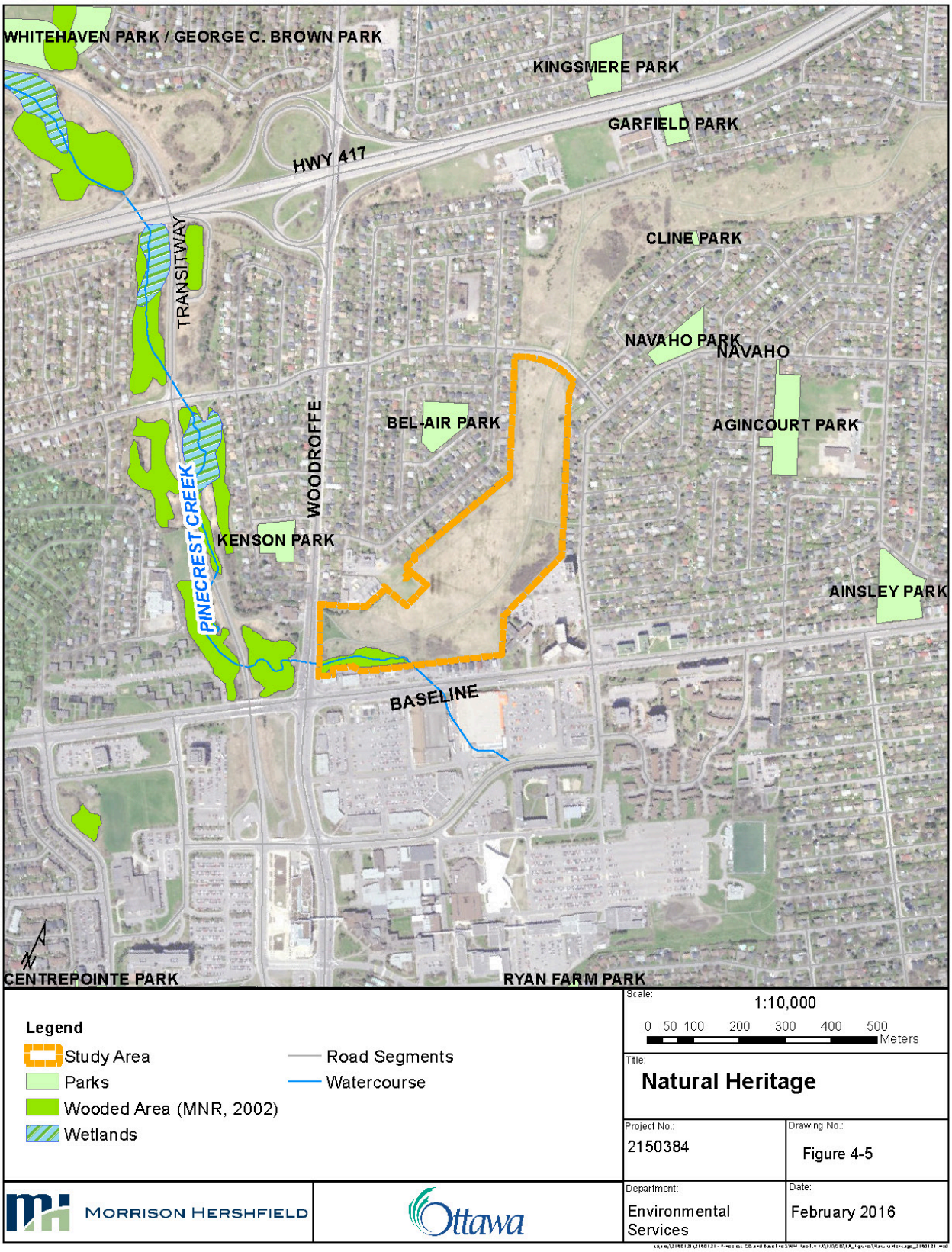



**Figure 4-5: Natural Heritage**

#### 4.3.8.1 Zone 1 – Creek and Channel

The more mature vegetation along the creek corridor consists of Willow, Poplar, Ash with isolated Elm with an understory of Virginia Creeper, Buckthorn, shade tolerant forbs, sedges, ferns and grasses.

No specimen or 'significant' individual species was encountered in this zone.

**Photo 4: Landscape Zone 1 - Bucolic scene along Pinecrest Creek (JFSA, 2015)**

#### 4.3.8.2 Zone 2 – Meadows

Plant material within the Meadow is less than 20 years old and described as very ‘young’. It consists primarily of pioneer species moving in from Zone 3. Species consist of Chokecherry, Manitoba Maple, Dogwood and some isolated Ash and Elm trees.

**Photo 5: Landscape Zone 2 - Old fields transforming into meadows (JFSA, 2015)**

#### 4.3.8.3 Zone 3 - "The Verge"

The Verge is identified as "significant" as it provides the nurse crop for seedlings that are slowly regenerating the woody species. Some desirable native trees including Elm, Ash, Black Walnut and Maple have seeded into the site as well as a significant amount of ornamentals. The common Ottawa invasive species (Buckthorn, Honeysuckle, Dog-Strangling Vine, Garlic Mustard) are also gaining a foothold on the site.

**Photo 6: Landscape Zone 3 - Verge, drainage swale and hydro line along northern site boundary (JFSA, 2015)**

### 4.3.9 Wildlife and Habitat

The 2011 RVCA stream survey of Pinecrest Creek observed ducks, mallards, a Ring-Necked Gull, crows, a Cardinal, an American Goldfinch, and a Red-Winged Blackbird (RVCA, 2011).

In the 2011 RVCA stream survey of Pinecrest Creek, the only mammals observed were black squirrels (RVCA, 2011).

### 4.3.10 Species at Risk and Critical Habitat

A preliminary desktop review of Species at Risk (SAR) and Critical Habitat was undertaken using the Ontario Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC) mapping tool (7 April, 2016).

This preliminary investigation indicated that for the 1 km UTM grid (18VR4022) encompassing the Study Area, pale-bellied frost lichen is the only historically noted SAR. It was observed in 1902, is considered an “Endangered Species”, and grows on the bark of hardwood trees such as White ash, Black walnut, and American elm, and can also be found growing on fence posts and boulders.

Table 4-2 identifies SAR that have been observed within 10 km (18VR42) of the Study Area or along Pinecrest Creek, and which may have the potential to occur within the Study Area due to their compatible habitat characteristics. The

designation of the species from the *Endangered Species Act, 2007* (ESA), the *Species at Risk Act, 2002* (SARA), and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) are noted for each species.

**Table 4-2: Potential Species at Risk**

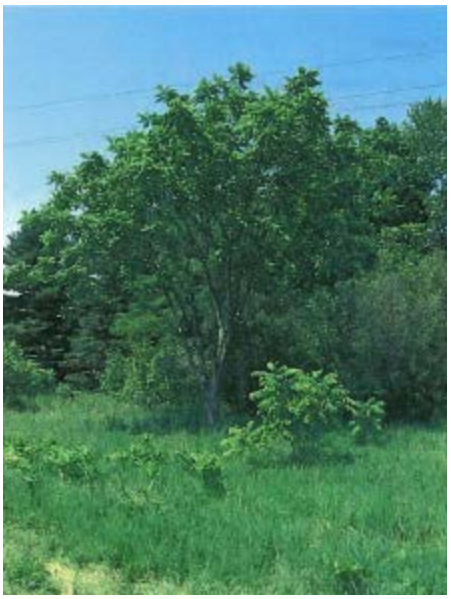
| Common Name | Scientific Name | ESA | SARA | COSEWIC | Comment |
|---|---|---|---|---|---|
| American Eel | *Anguilla rostrata* | END | No Status | THR | Observed in Pinecrest Creek |
| Bank Swallow | *Riparia riparia* | THR | No Status | THR | Observed within 10km of the Study Area |
| Barn Swallow | *Hirundo rustica* | THR | No Status | THR | Observed within 10km of the Study Area |
| Blanding's Turtle | *Emydoidea blandingii* | THR | Schedule 1, THR | THR | Not observed in Pinecrest Creek |
| Bobolink | *Dolichonyx oryzivorus* | THR | No Status | THR | Observed within 10km of the Study Area |
| Butternut | *Juglans cinerea* | END | Schedule 1, END | END | Observed around Pinecrest Creek |
| Chimney swift | *Chaetura pelagica* | THR | Schedule 1, THR | THR | Observed within 10km of the Study Area |
| Common nighthawk | *Chordeiles minor* | SC | Schedule 1, THR | THR | Observed within 10km of the Study Area |
| Eastern Meadowlark | *Sturnella magna* | THR | No Status | THR | Observed within 10km of the Study Area |
| Eastern Wood-Pewee | *Contopus virens* | SC | Schedule 1, SC | SC | Observed within 10km of the Study Area |
| Milksnake | *Lampropeltis triangulum* | SC | Schedule 1, SC | SC | Observed in Pinecrest Creek |
| Pale-bellied Frost Lichen | *Physconia subpallida* | END | No Status | END | Observed within 1km of the Study Area |
| Wood Thrush | *Hylocichla mustelina* | SC | No Status | THR | Observed within 10km of the Study Area |

*SC – Special Concern*
*THR – Threatened*
*END - Endangered*

The Ontario MNRF and the Rideau Valley Conservation Authority (RVCA) were contacted to confirm potential species and habitat within the Study Area. The requests for information are provided in Appendix F. One butternut tree was also

surveyed within the Study Area and as a result additional field investigations for butternut were undertaken.

#### 4.3.10.1 Butternut Trees



Eighty-seven (87) Butternut trees (*Juglans cinerea*) have been verified by field studies to date on the NCC property.

Butternut is endangered under the Ontario *Endangered Species Act, 2007* (ESA); Schedule 1, endangered under the federal *Species at Risk Act, 2002* (SARA); and endangered according to the Committee on the Status of Endangered Species in Canada, 2003 (COSEWIC). Butternut is a medium-sized tree that can reach up to 30 m in height. It belongs to the walnut family and produces edible nuts in the fall. The bark of younger trees is grey and smooth, becoming ridged as it ages.

**Photo 7: Butternut Tree**

Under the Species At Risk Act (S.C. 2002, c. 29), all Butternuts found on federal property are protected, unless they are determined to be hybrid. Hybridity testing is recommended in order to confirm the genetic status of the 87 specimens found on the subject site.

## 4.4 Socio-Economic Environment

### 4.4.1 Aboriginal Land Claims

The negotiators for the Algonquins of Ontario, the Government of Canada and the Government of Ontario released a Preliminary Draft Agreement-in-Principle in December 2012 for public review. This draft document was put forward to the public. Following extensive consultations which took place in 2013, revisions to this document were negotiated by Canada, Ontario and the AOO. These revisions were reflected in the proposed Agreement-in-Principle which was announced and made available to the public in June 2015.

In February and March 2016, the AOO held a vote on the proposed Agreement-in-Principle and announced their vote results on March 17, 2016. Following approval by all three parties, the AOO, Canada and Ontario signed this non-binding Agreement-in-Principle on October 18, 2016. With the signing of the Agreement-in-Principle, negotiations toward a Final Agreement can begin. It is noted that private property will not be expropriated to settle this claim, and the rights of private land owners to make use of and access their land will be maintained. The documentation available to date does not identify the Study Area or adjacent lands as proposed Algonquin settlement lands.

### 4.4.2 Cultural Heritage

#### 4.4.2.1 Archaeological Potential and Resources

The City of Ottawa GIS database identifies the entire Study Area as having archaeological potential (Figure 4-6).

### 4.4.3 Public Land Ownership

The NCC owns the Pinecrest Creek corridor (Figure 4-7), including the Study Area. The Pinecrest Creek corridor is connected to the Sir John A. Macdonald Parkway and forms an important linkage to the recreational trail network in the City of Ottawa.

### 4.4.4 Existing Land Use

Current use of the site is primarily open greenspace with a NCC recreational pathway traversing the site in an east-west orientation. This pathway is the eastern end of the 8 km Experimental Farm Pathway that continues as the Pinecrest Pathway on the west side of Woodroffe Avenue. The pathway network connects the site with pathways from Parliament Hill, along the Rideau Canal and the Ottawa River.

Surrounding land use is shown on Figure 4-7. Residential development, predominantly single detached residential, borders the site on the northwest (Bel Air Park) and east (Bel Air Heights). Saint Daniel Elementary School and Ottawa Hydro's Woodroffe Transformer Station are located adjacent to the northwest comer of the site. A 193-bed long-term care home (Extendicare Medex) is located at the southeast border along with a 270 unit nine-storey apartment building (Meadowbrook Place).

A mixture of low rise retail stores and offices along Baseline Road skirt the southern boundary of the site. The City's Centrepointe property is kitty comer to the site across the Baseline/Woodroffe intersection. A regional shopping centre is located immediately across from the site on the south side of Baseline Road.


**Figure 4-6: Archaeological Potential**

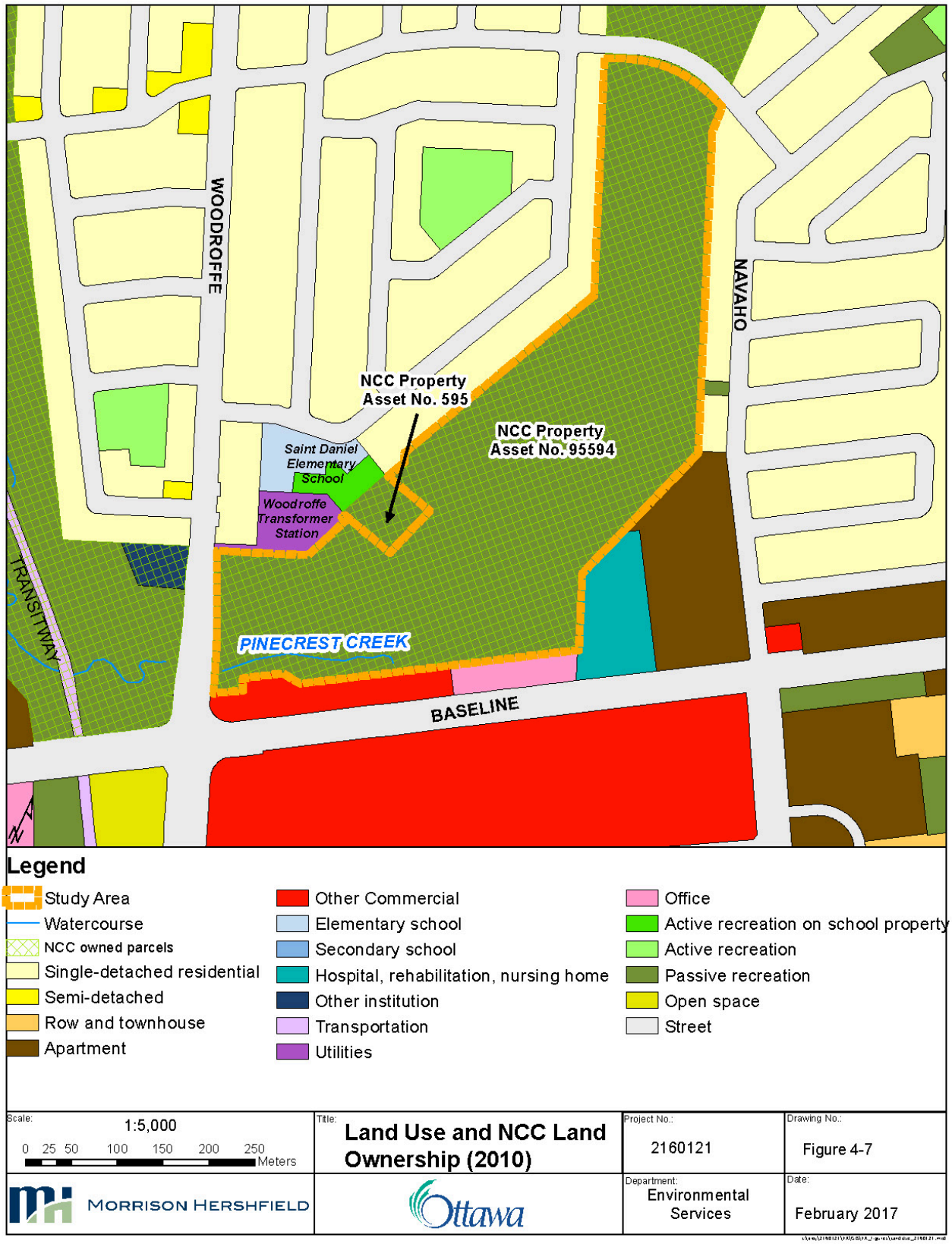



**Figure 4-7: Land Use and NCC Land Ownership (2010)**

#### 4.4.4.1 Easements and Leaseholds

In addition to the open space and pathway corridor, the Feasibility Study identifies a number of easements and leaseholds within the site including an above ground electrical line which passes along the area's northwestern boundary (Figure 4-8).

- There are two (2) Hydro One high voltage transmission systems entering and leaving the Woodroffe Transfer Station (Woodroffe TS);
- There are two (2) NCC easements for Hydro Ottawa within the site;
- A drainage Right-of-Way (ROW) easement is located between the commercial property at Baseline Road and Woodroffe Avenue;
- NCC records show a "Sewer, Culvers, Mains" easement located behind the commercial property on Baseline Road; and
- A 0.4 ha school playing field fenced off in the northwestern part of the area which is leased to the Ottawa Catholic School Board.

## 4.5 Transportation Routes

### 4.5.1 Road Network

The road network surrounding the Study Area is indicative of the highly urbanized environment in which it is situated. Baseline Road and Woodroffe Avenue are Arterial Roads and form the southern border and western boundaries of the Study Area, respectively. The northern and eastern extents of the Study Area are adjacent to Iris Street and Navaho Drive, respectively.


**Figure 4-8: Easements and Leaseholds within the Study Area**

### 4.5.2 Transit

#### 4.5.2.1 Western LRT

Stage 2 of Ottawa's LRT is scheduled to be operating by 2023, where the west extension will run from Tunney's Pasture to Baseline Station, with an extension from Lincoln Fields to Bayshore Shopping Centre. The Baseline Station extension is planned to extend from Lincoln Fields along the existing Bus Rapid Transit (BRT) route that runs through the Pinecrest Creek corridor. LRT will run with twin tracks in a north-south direction to the west of the Study Area. The tracks will be grade-separated from the road and pass under Baseline Road. Until its construction, BRT will continue to run in the same location through the Pinecrest Creek corridor between Lincoln Fields and Baseline Road to the west of the Study Area (Figure 4-9).

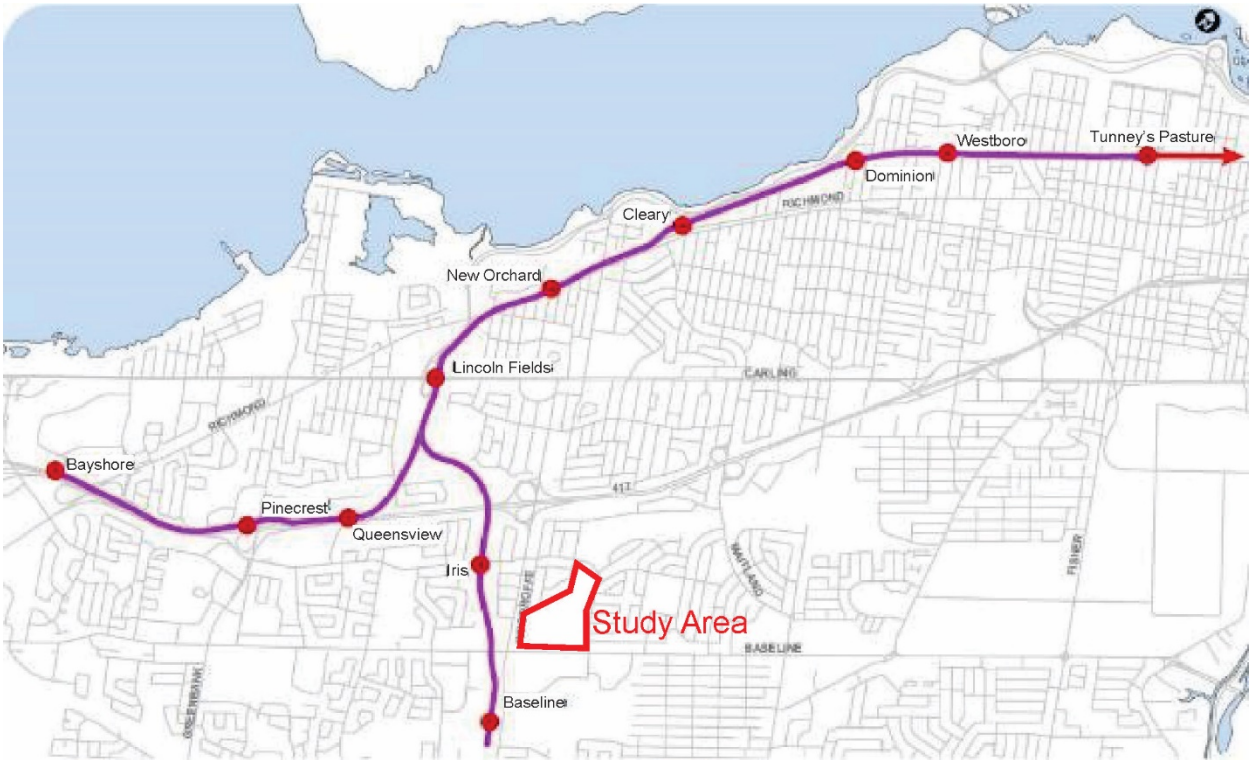



**Figure 4-9: Ottawa LRT Stage 2 Confederation West Extension and Station Locations (City of Ottawa)**

#### 4.5.2.2 Baseline Road Bus Rapid Transit

As indicated on the City of Ottawa website, an EA is currently being completed for the Baseline Road Rapid Transit Corridor (Bayshore Station to Billings Bridge Station), which is intended for an at-grade BRT to run east-west from Bayshore Station, along Baseline Road to Baseline Station, and east along Baseline Road to Billings Bridge Station. The City of Ottawa's 2013 Transportation Master Plan (TMP)

identifies Baseline Road as an "at-grade Bus Rapid Transit" corridor, with Baseline Station to Billings Bridge Station to be implemented within the planning horizon to 2031, subject to funding; and the Baseline Station to Bayshore Station to be implemented post-2031.

The alignment of the proposed BRT corridor runs the length of Baseline Road, with the exception of where it enters Baseline Station. The corridor returns to Baseline Road to the east and west of the Study Area (Figure 4-10).

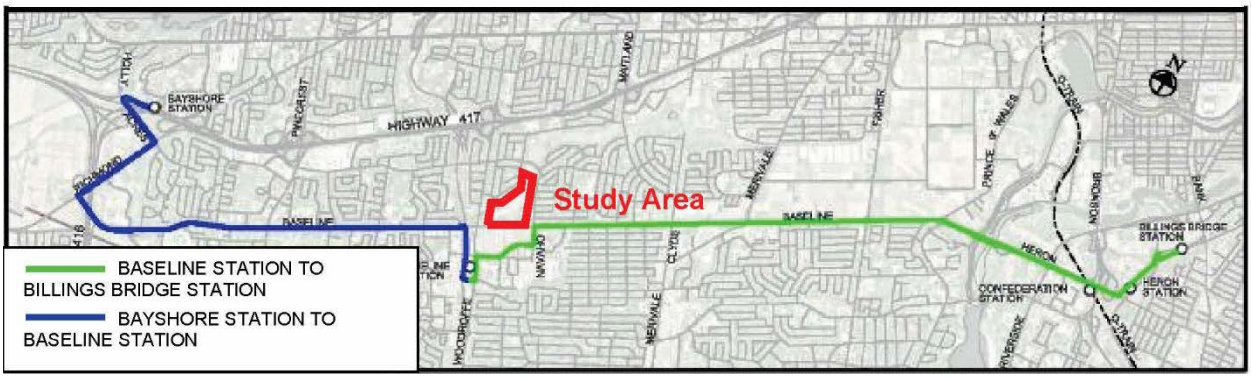



**Figure 4-10: Baseline Road Rapid Transit Corridor Pre- and Post-2031 (City of Ottawa)**

### 4.5.3 Recreation & Pedestrian/Cycling Routes

As previously mentioned in Section 4.4.4, the Study Area is traversed by the NCC's Experimental Farm Pathway. The pathway forms part of an extensive pedestrian and cycling network within the City (Figure 4-11).

## 4.6 Utilities and Infrastructure

### 4.6.1 Drainage Infrastructure

As previously mentioned, a drainage ROW easement is located between the commercial property at Baseline Road and Woodroffe Avenue. The site was formerly occupied by Tony Graham Motors Ltd. and the easement records received still have that company as the client (JFSA, 2015). It is assumed that there is a drainage pipe to the creek located in this easement carrying runoff from the commercial property to discharge to the creek.

The Baseline outfall is located north of Baseline road and approximately 210 m east of Woodroffe Avenue. The catchment area for the Baseline outfall has a minor system drainage area of 420 ha and major system drainage area of 460 ha. It is bordered to the west by Woodroffe Avenue, to the south by an existing railway corridor north of Medhurst Drive, to the east by Merivale Road, to the north by Baseline Road, and extends in the north-east to the Experimental Farm Pathway between Maitland and Clyde Avenues. Approximately 60% of the catchment area is serviced by storm sewers with the remaining 40%, in the south and east, draining through ditches and eventually connecting to the storm sewer network.

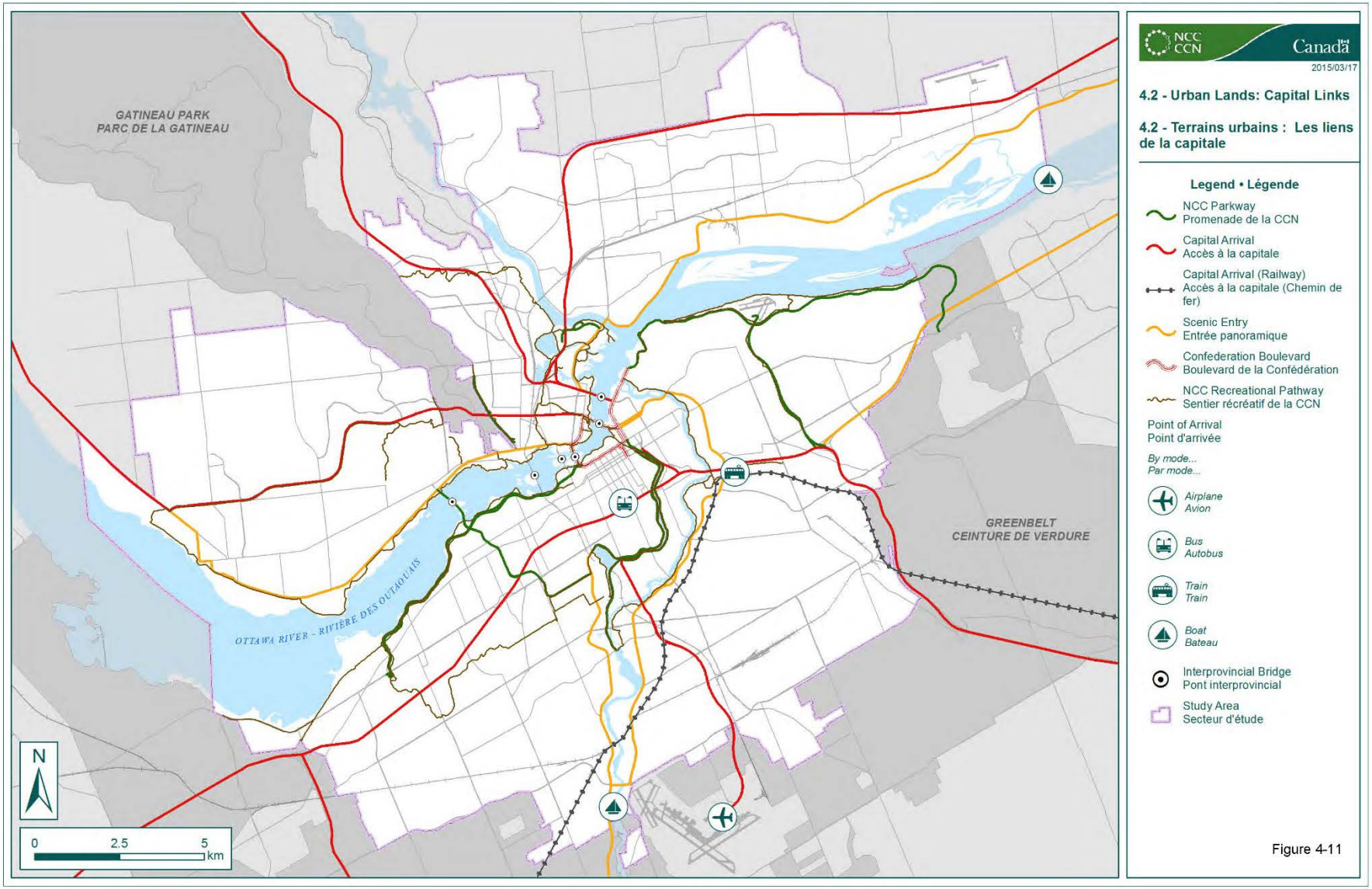



**Figure 4-11: Capital Links (NCC, 2015)**

There are existing gabion walls at the Baseline outfall into Pinecrest Creek. Upon visual inspection, Golder (JFSA, 2015) noted that the gabion wall along the north bank of the creek is fairly short in height and shows no signs of collapse or instability. The Feasibility Report does, however, note that it appears to have been poorly constructed (i.e., some of the gabion baskets are deformed and sagging) and that it has been partially damaged by vandalism.

The much higher gabion wall that forms a wing wall along the west side of the outlet (box culvert) appears to be bulging/deforming. If the gabion wall is to be maintained as part of the pond design, a structural evaluation of its condition should be carried out.

#### 4.6.1.1 Drainage Easement

The Feasibility Study notes that there is a "Sewer, Culverts, Mains" easement located behind the commercial property on Baseline Road. The easement is in the name of Scotts Restaurant which is/was a restaurant (presently a KFC) located immediately east of where the easement is located. The easement site is occupied by a parking lot bordered by a wall immediately above the creek valley. The easement may have been established during the re-alignment of the Pinecrest Creek outlet and the removal of the previous corrugated box culvert.

### 4.6.2 Sanitary and Storm Sewers

As illustrated in Figure 4-12, sanitary and storm sewers are located adjacent to the Study Area, but none have been identified within the study boundaries. There are no combined sewers identified adjacent to the site, and sanitary and storm infrastructure is primarily located within the road ROW.

Based on the City's field survey, the invert of the 3000 mm x 1800 mm box trunk sewer that would be serviced by the proposed SWM pond is at an elevation of 79.01 m. The culvert crossing Woodroffe Avenue downstream of the proposed facility has an upstream invert elevation of 77.70 m. It is noted that this trunk sewer has two main lines, one that runs east to west along Baseline Road from Merivale Road to the outlet and one that runs south to north through the Algonquin College campus. The trunk sewer collects drainage from the southern portion of Copeland Park, St. Claire Gardens and Meadowlands/Crestview.

### 4.6.3 Watermains

Similar to the sanitary and storm infrastructure, the water distribution network is located adjacent to the Study Area with watermains located within the road ROW. There are no watermains located within the Study Area (Figure 4-13).

### 4.6.4 Hydro One

One easement (narrow yellow cross-hatched line on Figure 4-14) is located along the site's northern boundary just east of Woodroffe Avenue. This is for a Hydro

One underground 115 kV transmission cable exiting the Woodroffe TS and heading westwards, then northwards behind the properties on Adirondack Drive.

The second easement (broad yellow cross-hatched line on Figure 4-14) is for corridor lands for a set of Hydro One overhead 115 kV transmission lines, poles and supports. This easement corridor crosses Woodroffe Ave, skirts the Woodroffe TS, and heads northeast along the site's north boundary behind the properties on Field Street. The City's Surveys and Mapping information shows the easement as 30.48 m wide and lists the property Instrument No. as CRS70628.

Hydro One's requirements for access to these corridors are: a 6 m wide clear access route along the transmission line to each structure; 15 m clear radius around each structure for maintenance set-up; positive drainage on the corridor; and no increase in elevation of ground surface.

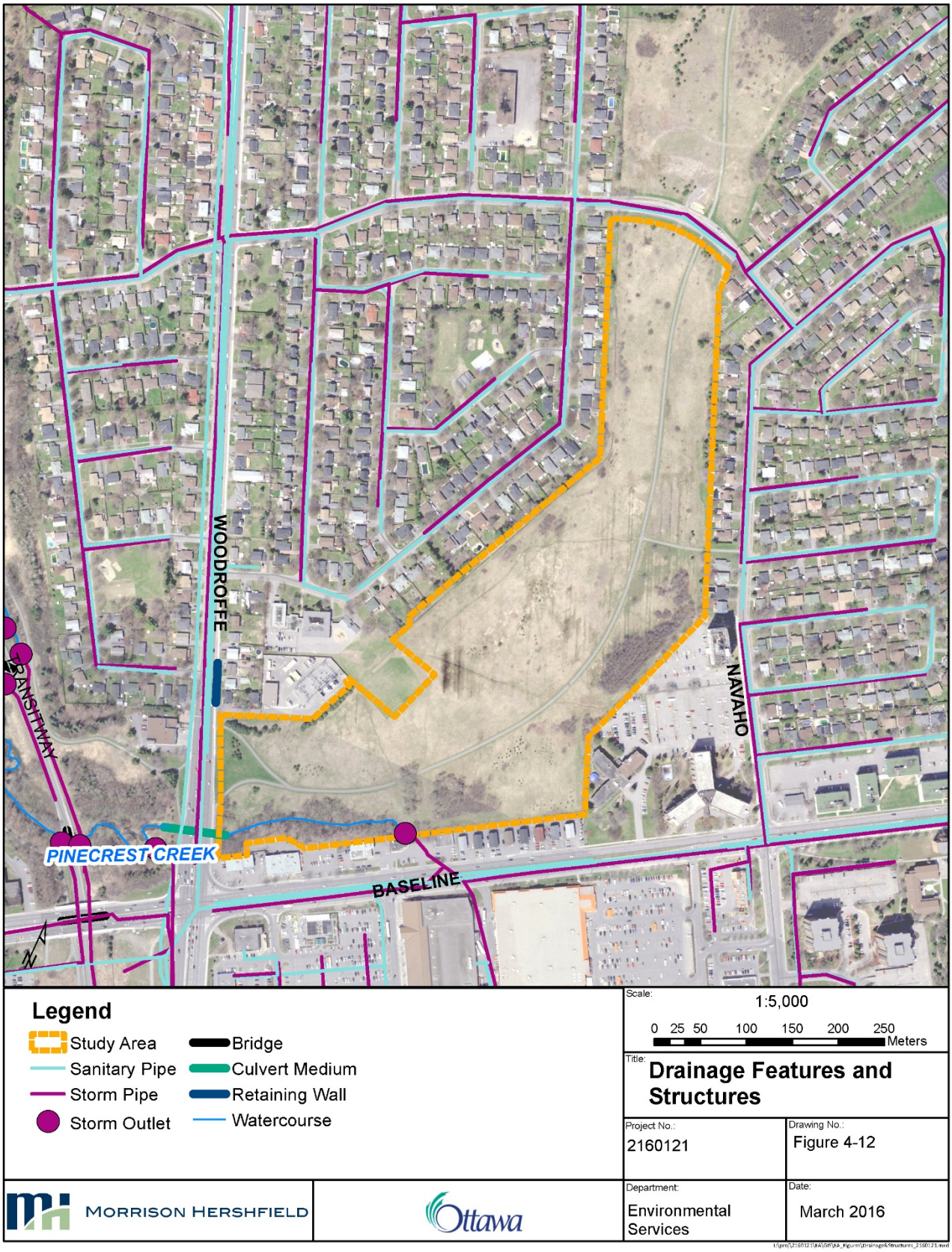



**Figure 4-12: Drainage Features and Structures**

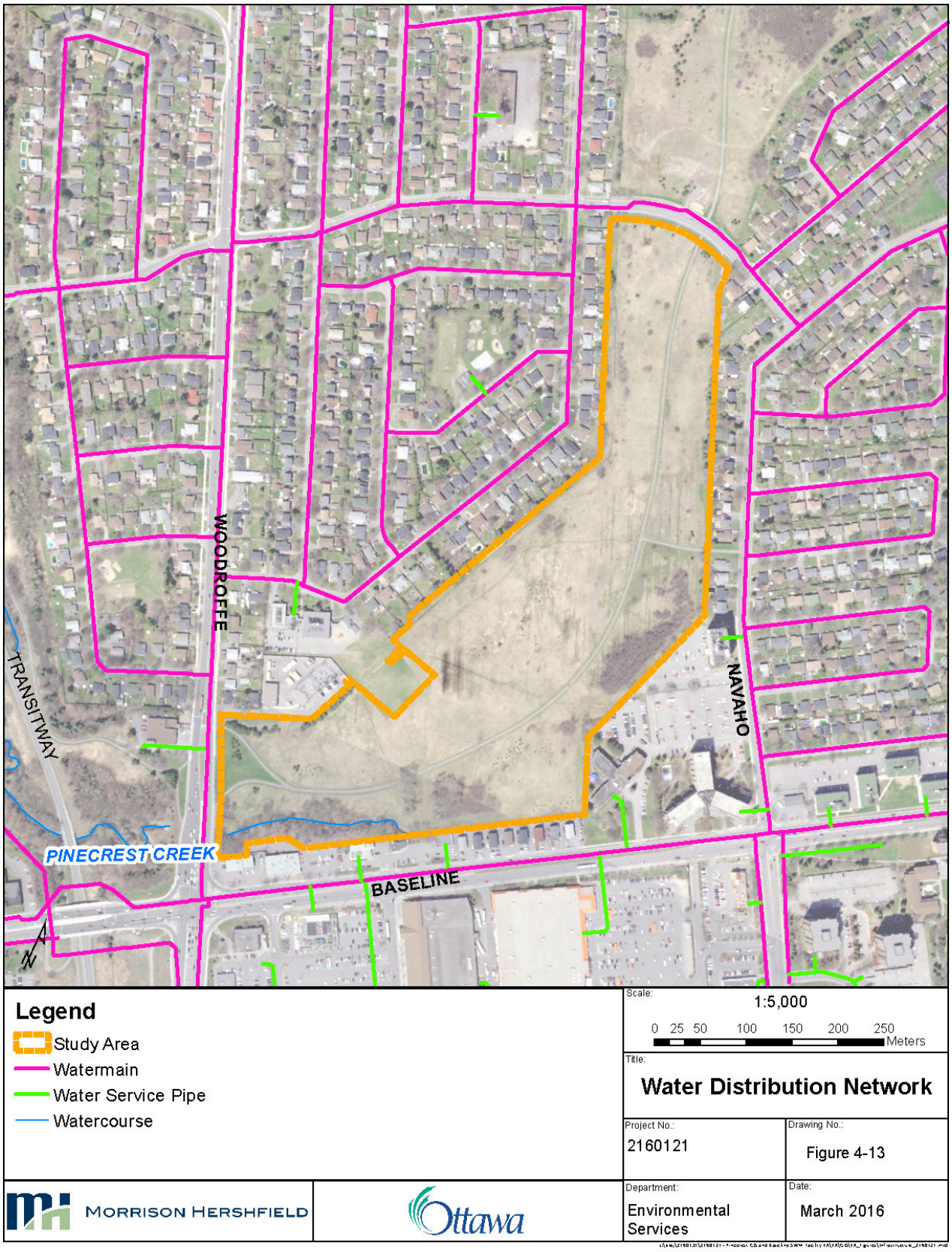



**Figure 4-13: Water Distribution Network**

### 4.6.5 Hydro Ottawa

As noted, there are two (2) NCC easements in favour of Hydro Ottawa within the site. One easement runs along the western boundary of the site parallel to Woodroffe Avenue from Baseline Road to the site's northern boundary. This easement is for 13kV and 4kV overhead distribution lines.

The second easement runs east-west across the site and is for two (2) direct buried 13 kV cables, which are reported to be at most 1.5 m below grade. The City's Surveys and Mapping information shows the easement as 3.66 wide.

## 4.7 Constraints and Opportunities

### 4.7.1 Constraints

The 2015 Feasibility Study identified a large number of constraints within the Study Area to be taken into consideration in the development of potential alternatives. Existing and proposed major infrastructure, as well as specific natural features, were considered important to protect and/or conserve. Table 4-3 describes these constraints, while Figure 4-14 displays them.

**Table 4-3: Site Constraints**

| Feature | Constraint |
|---|---|
| **Geotechnical** | **Pond side slopes:** Stability analysis indicate that the pond side slopes should have a factor of safety of 1.5 against long term instability if inclined at 3 horizontal to 1 vertical (3H:1V), or flatter. |
| | **Pond excavation:** The floor of the excavation will consist of silty clay and glacial till below the groundwater level. These materials are sensitive to disturbance by construction traffic and ponded water. Excavation of the pond in one bench, with the equipment working from existing ground surface and not travelling within the excavation, may be necessary. This may affect the construction footprint. |
| | **Pond floor:** The bottom of the pond will consist of silty clay and glacial till. These materials are sensitive to disturbance by construction traffic and ponded water. If the pond floor needs to be trafficable, the bottom of the pond should be lined with a material such as rip-rap, a synthetic geocell erosion layer, or interlocking concrete blocks to minimize disturbance to the subgrade etc. A geotextile may also be required in addition to the materials mentioned above. This will affect the cost and excavation level. |
| | **Margin between pond and surrounding buildings and structures:** Edge of the pond should be located at least 50 m away from the nearest structures to minimize the impacts of the groundwater level lowering on the performance of these structures. 15 m margin is definite; and 15-50 m may be required. |

| Feature | Constraint |
|---|---|
| | **Limited Capacity to firm silty clay deposit on site to accept additional load from outlet structure, pedestrian bridges** without undergoing significant settlement. In case of bridges, it is possible that flatter pond side slopes would be required, which in turn would result in a longer bridge and higher foundation loads. |
| | **Limited capacity of underlying unweathered silty clay to accept additional load from the weight of fill** without undergoing significant consolidation settlement. Therefore, if settlement-sensitive buried services or other structures are present or proposed in the area of stockpiled material, the height of the stockpile will need to be limited in order to control the amount of settlement of the silty clay. A limit of about 2.8 m above existing ground surface where settlement is a concern has been identified. |
| | **The soils at this site are highly frost susceptible** and the foundations for the structure should therefore be provided with a minimum of 1.5 m of earth cover for frost protection purposes. |
| | **Concerns about the status quo on south slope of the creek:** the gabion wall, which forms a wing wall along the west side of the outlet, appears to be bulging/deforming. If the gabion wall is to be maintained as part of the pond design, a structural evaluation of its condition should be undertaken. The condition of the retaining walls and the condition of parking lot directly above the slope also brought to the City's attention. The drainage ROW is on this side of the reach. |
| **Landscape and SAR** | **National Interest Land and part of the City-wide pathway use designation:** Importance of maintaining the recreational pathway corridor. |
| | **Rodent population:** is a concern for reforestation. It will be important to maintain swales as rodent and fire breaks around the perimeter. |
| | **Species at Risk:** One Butternut tree is present along the northern border of the site. If it is naturally occurring, and a retainable tree it will be protected under the OESA and SARA. |
| | **Tree Removals**: removal of mature trees may be of concern to the users of the green corridor, which provides a pleasant contrast to surrounding commercial and residential development. |
| | **Heavy soils** making the selection of appropriate plant species an important task. |

| Feature | Constraint |
|---|---|
| **Property Use and Easements** | **Hydro Ottawa and Hydro One easements** occupy a considerable part of the site. Overhead lines are on the perimeter and do remove useable space from the site. However, because they are on the perimeter they do not appear to be as much of a constraint as the Hydro Ottawa buried, 13 kV east-west cables, which cross the middle of the site. Hydro Ottawa has indicated that grade changes in the vicinity of these cables would be highly restricted. Hydro Ottawa has provided rough estimates for an entire relocation (2012 dollars).<br>All easement rights would need to be transferred to the new location at the property owners expense. |
| | **Leased school play field extends into the area of interest:** Communications with the school board in 2012 indicate that the school board would object to a loss of use of the property or encroachment of the pond on to the play field. Design will need to accommodate this land use. |
| **Fluvial Geomorphic** | **Connection channel poses a significant constraint to the design:** It is preferred to have the connection channel between the pond and Pinecrest Creek as an open watercourse feature; however the location of the connection will have an impact on the overall footprint of the pond. Considering the preliminary connection channel configuration to carry the threshold discharge (1.5 m bottom width, depth 0.33 m, top width 2.17 m and gradient 0.002 m/m), with an appropriate floodplain of 2 m on each side of the channel, the minimum width required would be 6.17 m. From the floodplain elevation to the top of ground elevation would require side slopes of 3:1 for safety reasons; this means that for every metre the floodplain is below the elevation of the surrounding ground (top of slope), an additional 6 m is required in corridor width. If the connection is made close to the existing creek outlet, a corridor with a top width of 33.5 m would be required; if the connection were made lower down the system near Baseline Road, a corridor with a top width of approximately 18.2 m is needed. Connection at a point approximately half way along the reach would require a corridor with a top width of approximately 28 m. |
| **Stormwater Management** | **Pinecrest Creek Outlet Elevation:** Based on the City's field survey, the invert of the 3000 mm x 1800 mm box trunk sewer that would be serviced by the proposed facility is at an elevation of 79.01 m to avoid permanent backup into the trunk sewer. |
| | **Elevation of culvert crossing Woodroffe Avenue (downstream of the proposed facility):** This culvert crossing elevation of 77.70 m will control the elevation to the lowest potential outlet invert for the facility. |

| Feature | Constraint |
|---|---|
| | **Storm sewer configurations servicing the lands upstream of the proposed SWM pond:** The Southwest Transitway Extension is located west of Woodroffe Avenue and south of Baseline Road. This area is serviced by the Woodroffe Trunk sewer, or by a dedicated system in the case of the Southwest Transitway Extension, which outlets to Pinecrest Creek downstream of the proposed pond. **Controlling stormwater from the existing residential developments, upstream of the proposed pond will provide a partial trade-off, of the flows from the future Baseline LRT/BRT and South West Transitway Extension to discharge uncontrolled downstream of Baseline Road.*. |

*** NOTE:** The text in Table 4-3 has been updated from the 2015 JFSA original report for clarification

### 4.7.2 Opportunities

Just as the 2015 Feasibility Study identified a large number of constraints at the Study Area, it also identified opportunities to enhance some of the bio-physical and social components of the site. Table 4-4 describes these opportunities.

**Table 4-4: Site Opportunities**

| Feature | Opportunity |
|---|---|
| **Geotechnical** | **Pond Construction: It is not considered necessary to line the pond.** This is due to the relatively limited rate of groundwater inflow into the pond (over long term once the groundwater level in the silty clay has been lowered to the permanent pool elevation of 79.0 m) and minimal loss of water from the pond through the native soils (due to relatively low hydraulic conductivities of sediments and the proposed permanent pool elevation relative to groundwater levels). |
| **Landscape and SAR** | **Evolving landscape and invasive species:** Realignment of the creek and the construction of the SWM pond could provide the stimulus for a redesign of the Western Corridor into a more interesting and usable property. The removal of invasive species and the use of native material in reforestation techniques would continue the philosophy of "ecological restoration" from the Pinecrest Creek Corridor projects. |
| | **Potential for Interesting Site Design:** Environmental restoration and additional recreational opportunities may be benefits of design. Wetland zones along the creek could provide habitat for additional bird species. |
| | **Excavation material could be used on-site** to create berms that would define more "intimate" areas for recreational activities such as picnic areas. |
| **Property Use and Easements** | **Enhancement of the site's contribution to the "Western Corridor"** in the NCC Urban Lands and the City's Open Space and Leisure Lands and City-wise Pathway. |
| **Fluvial Geomorphic** | **Maintain active channel length and low flows in Reach 6** (refer to SWM opportunities presented below) |
| **Stormwater Management** | **Maintain daylighted Reach 6:** In an off-line facility design, if the inlet and outlet pipes are located as close together along the creek as possible, this could minimize the length of channel that would be dry under low-flow conditions. An on-line facility would eliminate this concern, but would result in removal of a greater quantity of trees. |
| | **Diversion of low flow amount to the existing upstream limit of the creek**, allowing that flow to be conveyed downstream and meet the stormwater flow connection point. |

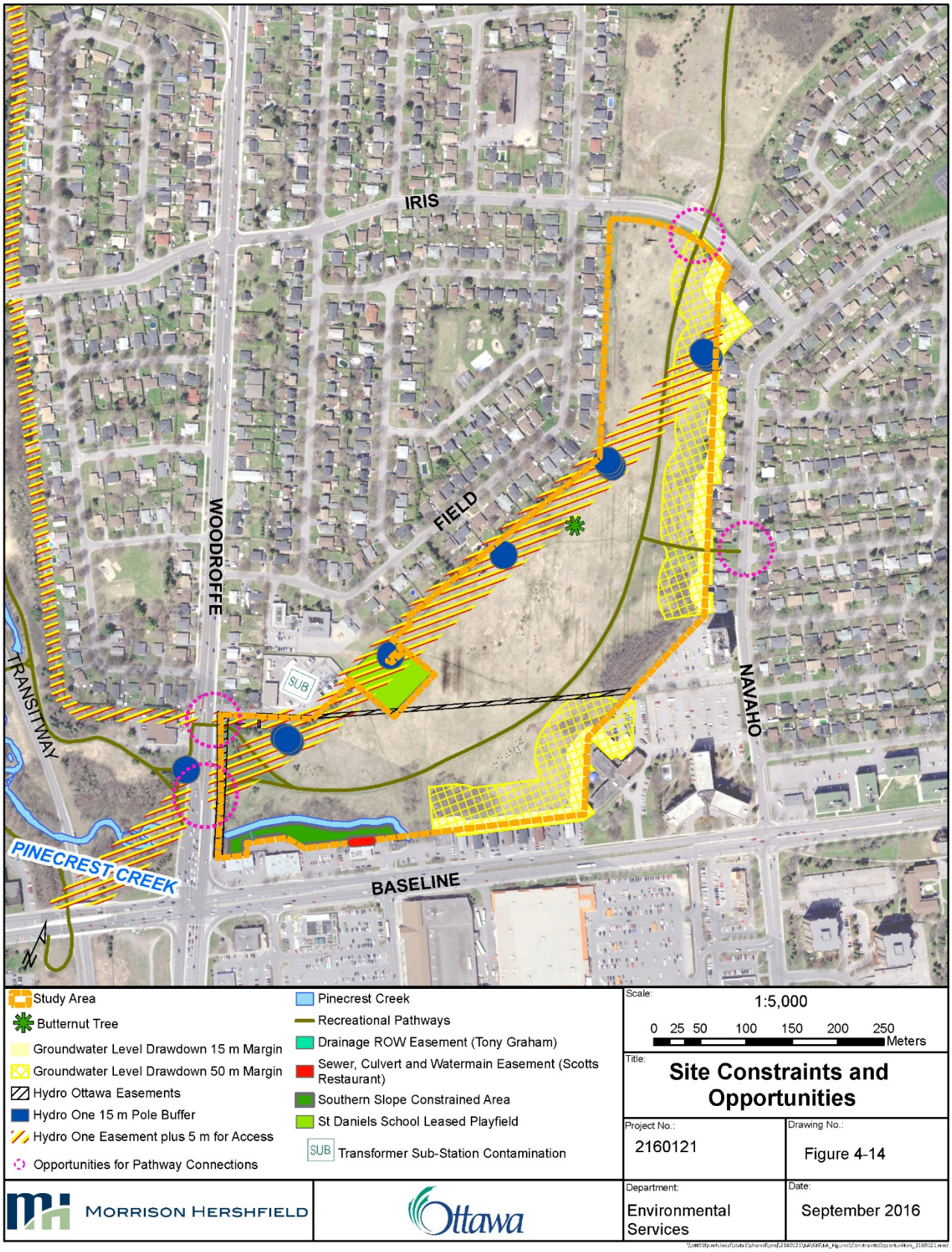



**Figure 4-14: Site Constraints and Opportunities**

# 5. ALTERNATIVE SOLUTIONS

The P/W SWM Retrofit Study (JFSA, 2011) provided a description of various SWM retrofit opportunities and retrofit plan scenarios for the Pinecrest Creek/Westboro Study Area (summarized below).

**Lot level measures** are SWM practices situated closer to the source of the stormwater runoff. Lot level/source controls can prevent pollutants from being picked up by runoff and can minimize the amount of off-site drainage. Though each lot (public or private) may be relatively small in size, the use of lot level practices on the sheer number of lots and properties in urbanized areas can combine to provide a powerful and effective means of controlling both the quantity and quality of water moving through an urbanized watershed. Examples of lot level measures for private and public lots include downspout disconnection/redirection, rain barrels and cisterns, rain gardens (bio-retention), and porous and permeable pavement/concrete.

**Stormwater conveyance systems** are the means by which stormwater is directed or conveyed from one location to another. Conveyance measures include drainage ditches and swales, and storm sewers. SWM measures along the conveyance route can include stormwater exfiltration systems, grassed swales, and pervious catch basins.

**End-of-pipe facilities**, the third line of protection (after lot level and conveyance measures), are larger scale SWM practices typically implanted within open spaces and greenways. Such areas have often been the venue for implementation of more conventional SWM methods such as settling ponds and detention basins. More recently, this has been expanded to include methods such as constructed wetlands and large sub-surface water retention structures. End-of-pipe facilities may include oil-and-grit separators (OGS), screening action types of OGS (Continuous Deflection Separation System) and wet-ponds.

## 5.1 Development of Alternatives

Definition of the lot level and conveyance SWM retrofit approaches was completed in the 2011 P/W SWM Retrofit Study (JFSA) by first selecting the most suitable and effective measures from a wide range of SWM lot level and conveyance controls. Suitability refers to the potential to implement the SWM measure throughout the SWM Retrofit Study Area and over the long-term, on both public and/or private lands. The end-of-pipe facilities considered included wet SWM ponds and oil-and-grit separators.

Selection of the potential retrofit scenarios (comprised of varying combinations of measures) was based on the feasibility of retrofitting the measures into the Study Area's various land uses and development types to get widespread application of the measures on public and private property.

The P/W SWM Retrofit Study (JFSA, 2011) completed an extensive screening process for end-of-pipe facilities (EoPs) to select potential locations, with a long list of 18 locations assessed. The locations were chosen across the Study Area, spanning a number of the main outfall contributors to both Pinecrest Creek and the Ottawa River. Locations were originally selected based on space availability, drainage area, and minimal nearby infrastructure. The long-list was then screened based on a number of factors including drainage inverts, space limitations, mature vegetation impacts, existing servicing conflicts and location access. Following the screening process, the P/W SWM Retrofit Study

determined six (6) locations within the Pinecrest Creek subwatershed and Westboro catchments could be considered potential locations for EoPs. Further details can be found in the Appendices of the P/W SWM Retrofit Study (JFSA, 2011).

Of the six (6) selected EoPs, five (5) are located on NCC lands within the creek corridor and along the shoreline of the Ottawa River. The NCC lands within the P/W Study Area are typically located at the main outfall locations of interest. NCC was consulted during the study to arrive at the six selected EoP locations, however, this short-list is subject to NCC approval and additional study prior to Implementation.

Figure 5-1 highlights the location of short-listed EoP potential locations (including the current Study Area as EoP16).

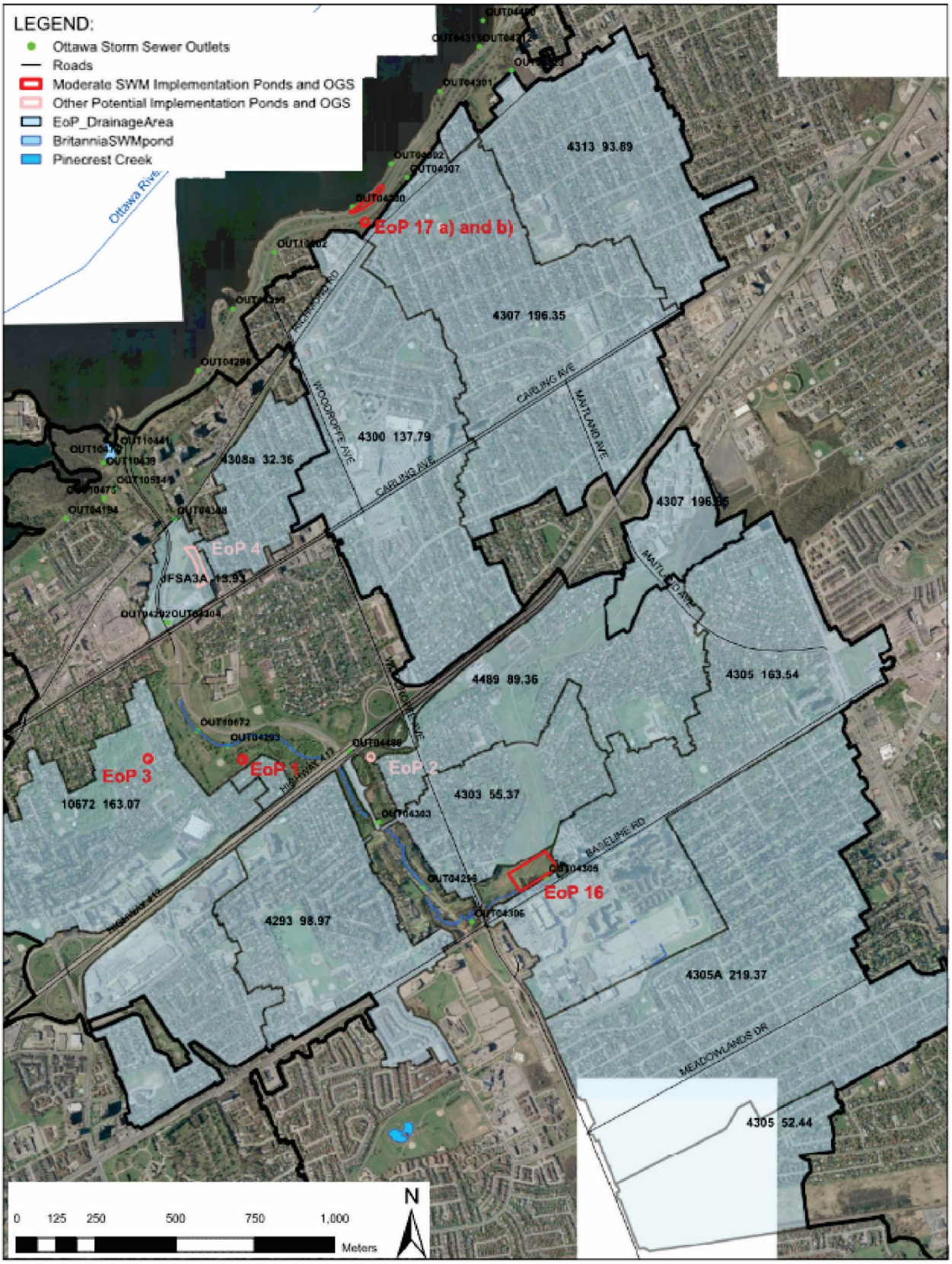



**Figure 5-1: Short-Listed EoP Facility Locations**

The selected SWM Measures, lot level, conveyance, and EoP facilities were used in various combinations to determine the alternative SWM Retrofit scenarios.

## 5.2 Description of Alternatives

Five (5) SWM retrofit scenarios were developed by JFSA (2011) to encompass a range of potential implementation levels for SWM measures within the study area. A primary consideration was the degree of "uptake" or the extent of implementation that can be expected. The uptake depends on a number of factors including acceptance (i.e., by private and public landowners), and feasibility.

The five SWM Retrofit Alternatives included:

1. Do Nothing (Existing Conditions)
2. Highest Practical (HP) SWM Implementation without End-of-Pipe Facilities
3. Highest Practical (HP) SWM Implementation with End-of-Pipe Facilities
4. Moderate SWM Implementation with End-of-Pipe Facilities
5. Public Property Only SWM Implementation with End-of-Pipe Facilities

### 5.2.1 Do Nothing (Existing Conditions)

The Do-Nothing Scenario was based on 2011 land use and storm drainage conditions, which included the very limited SWM that exists in the Study Area. Information on existing conditions was derived from City of Ottawa land use and infrastructure data and a series of lot level inventories was undertaken (JFSA, 2011). The Existing Conditions form the Study Area's baseline scenario, and reflects the impact of current practices. This scenario was used to determine areas where retrofit measures could be implemented for overall SWM improvements.

### 5.2.2 Highest Practical SWM Implementation without End-of-Pipe Facilities

The Highest Practical Implementation Scenario was composed of 2011 land use with the implementation of all the study's selected lot level and conveyance measures, but excluding the EoP facilities. "Highest Practical" indicates the highest level of implementation presumed to be feasible. This scenario provided an indication of the improvements achieved by implementation of lot level and conveyance measures only.

### 5.2.3 Highest Practical SWM Implementation with End-of-Pipe Facilities

The Highest Practical Implementation Scenario was composed of 2011 land use with the implementation of all the study's selected measures. "Highest Practical" indicates the highest level of implementation presumed to be feasible for lot level, conveyance and EoP facilities. The level of implementation of the EoPs, including OGSs and wet ponds was determined by the screening of possible EoP sites. As previously described, the sites were screened for space limitations, servicing conflicts, aesthetics, natural features and property ownership. Six (6) EoP sites were selected. The OGS were included for their water quality benefits and for their below ground installation, which allows for other uses of the ground surface.

### 5.2.4 Moderate SWM Implementation with End-of-Pipe Facilities

The Moderate Implementation Scenario was comprised of the same types of measures and EoPs as the Highest Practical with EoP Scenario, however, the extent of the implementation was at a "moderate" rather than "high" level. The Moderate Scenario implementation percentages were based on a 5-30% reduction from the Highest Practical Percentages. Four (4) of the six EoPs were selected for this scenario – one wet pond and one OGS less than the Highest Practical with EoP Scenario. The OGS were included for the benefits noted above.

### 5.2.5 Public Property Only SWM Implementation with End-of-Pipe Facilities

The Public Property Only Scenario include only measures located on publicly-owned lands. Public lands were defined as municipal, federal, provincial and local institutional (school board and school) lands. All EoPs are located on public lands; all the EoPs included in the Highest Practical Scenario are included in the Public Property Only Scenario. The implementation percentages used in this scenario were the same as those used in the Highest Practical Scenario. This provided an indication of the improvements that can be achieved without requiring participation from private landowners and individual homeowners. The OGS were included for the benefits noted above.

Table 5-1 summarizes the alternative SWM retrofit scenarios considered:

**Table 5-1: Summary of SWM Measure Retrofit Alternatives (JFSA, 2011)**

| SWM Measures | Scenario: Highest Practical SWM no EoP | Scenario: Highest Practical SWM with EoP | Scenario: Moderate SWM with EoP | Scenario: Public Property Only with EoP |
|---|---|---|---|---|
| Lot Level Public | All Included | All Included | Some Included | All Included |
| Lot Level Private | All Included | All Included | Some Included | None Included |
| Conveyance | All Included | All Included | Some Included | All Included |
| End-of-Pipe (EoP) | None Included | 6 Included: 3 OGS and 3 Wet Ponds | 4 Included: 2 OGS and 2 Wet Ponds | 4 Included: 2 OGS and 2 Wet Ponds |

## 5.3 Evaluation Criteria

The evaluation process used by JFSA (2011) in the P/W Retrofit Study was developed to determine the preferred SWM Retrofit Alternative (Scenario). The evaluation included scoring and ranking the alternatives using the results of water quality, quantity and fluvial geomorphologic modelling, and the predicted ability of each alternative to reduce flood

risk, erosion impacts, runoff volumes and peak flows and pollutant concentrations and loads.

### 5.3.1 Water Quality Assessment

Water quality modelling was used to predict the relative effectiveness of each of the SWM Alternatives in mitigating the impacts of runoff on water quality within Pinecrest Creek, and at various storm sewer outfalls to the Ottawa River. The WinSLAMM water quality software program was used, with additional modelling completed to determine the relative impact of the SWM Alternatives on peak *E.coli* counts at Westboro Beach on the Ottawa River.

### 5.3.2 Water Quantity Assessment

Hydrologic modelling was used to predict the relative effectiveness of each Alternative in mitigating the impacts of runoff volumes and peak flows discharging to Pinecrest Creek (JFSA, 2011). SWMHYMO software was used for this modelling with each of the five scenarios being run for the 1:2 year to 1:100 year single events for the City of Ottawa and four (4) hour Chicago and twenty-four (24) hour Soil Conservation Service (SCS) design storm distributions.

Results from the hydrologic modelling (Table 5-2) were used by JFSA (2011) to determine the potential effects of the Alternatives on the creek geomorphology, the existing flooding concerns and the hydrologic cycle within Pinecrest Creek. Peak flows from the full range of design storms were used in the hydraulic modelling to determine the maximum water surface elevations and the associated flood risk along Pinecrest Creek.

**Table 5-2: Hydrologic Cycle Indicator Results within Pinecrest Creek (JFSA, 2011)**

| Targets | Scenario: Do Nothing - Maintain Existing Conditions | Scenario : Highest Practical no EoP | Scenario: Highest Practical with EoP | Scenario: Moderate with EoP | Scenario : Public Property Only with EoP |
|---|---|---|---|---|---|
| Volume of the first 10 mm of runoff that is retained[1] | 7.67 mm | 8.22 mm | 8.22 mm | 7.86 mm | 7.78 mm |
| Volume of the first 10 mm of runoff that is retained ( x1000 $m^3$) | 180 x 1000 $m^3$ | 194 x 1000 $m^3$ | 194 x 1000 $m^3$ | 185 x 1000 $m^3$ | 182 x 1000 $m^3$ |
| Percent of First 10 mm that is retained | 76% | 82% | 82% | 78% | 77% |

| Targets | Scenario: Do Nothing - Maintain Existing Conditions | Scenario : Highest Practical no EoP | Scenario: Highest Practical with EoP | Scenario: Moderate with EoP | Scenario : Public Property Only with EoP |
|---|---|---|---|---|---|
| Percent Improvement in retaining the first 10 mm of runoff compared to the Existing Conditions Scenario | 0% | 8% | 8% | 3% | 1% |
| Percentage of Drainage Area over which the next 15 mm of runoff is detained[2] | 0% | 0% | 25% | 23% | 25% |
| Decrease in Effective Impervious Area[3] | 0 ha | 124 ha | 124 ha | 55 ha | 34 ha |
| Total Percent Impervious[4] | 35% | 32% | 32% | 33% | 34% |
| Total Effective Percent Impervious[4] | 28% | 22% | 22% | 25% | 26% |

*Note 1: The SWMHYMO results for total runoff volume from the 10 mm design storm event have been used.*
*Note 2: Only those drainage areas which are treated by wet ponds meet this criterion.*
*Note 3: Porous Pavement, downspout redirection and street narrowing decrease effective imperviousness,*
*Note 4: Replacing a pervious surface with a wet pond increases effective imperviousness.*
*The total percent imperviousness and effective percent impervious values are for both Pinecrest Creek only.*

HEC-RAS software was used to generate water levels and determine the flood risk along the creek corridor (JFSA, 2011). All proposed Alternatives produce peak flows lower than the existing conditions. A wet pond that provides some level of quantity storage was included in three (3) of the proposed scenarios. As such, the

level of service (LoS[1]) provided by the Sir John A. Macdonald Parkway pipe is improved for some of the proposed alternatives.

Table 5-3 summarizes the resulting LoS provided by the SJAMP pipe for each Retrofit Alternative.

**Table 5-3: Level of Service (LoS) of the Sir John A. Macdonald Parkway Pipe (JFSA, 2011)**

| Retrofit Scenario | LOS (Return Period) |
|---|---|
| Existing Conditions | 2 year |
| HP SWM without EoP | 2 year |
| HP SWM with EoP | 10 year |
| Moderate SWM with EoP | 10 year |
| Public Property Only with EoP | 5 year |

### 5.3.3 Fluvial Geomorphology Modelling

As outlined in the P/W Retrofit Study, the main assessment criteria for the physical functioning of Pinecrest Creek are related to erosion impacts (JFSA, 2011). This connection is important because under conditions of no stormwater management, rapid delivery of surface runoff to creeks via piped flow is a major contributor to erosion. In Pinecrest Creek, the lack of stormwater management has, over time, created an evolutionary cycle where the creek has responded to the delivery of stormwater with significant erosion.

Over the fullness of time, erosion in the creek has decreased in magnitude and extent as the creek has adjusted to flows incident upon it; however there are still erosion areas that have not completed the adjustment cycle, so the creek, while it remains in a state of flux, is not showing uncontrolled response to flows through erosion at this time.

Indicators of erosion assessed for the purposes of this study were:

- Sediment Regime and Size;
- Channel Stability;
- Erosion Potential; and
- Aquatic Habitat.

In terms of targets in the analysis, the following scoring criteria were used:

- Alternatives which have potential to improve habitat and increase fishery potential were scored high;
- Those which maintain existing conditions were scored medium; and
- Those alternatives which decrease habitat and fishery potential were scored low.

[1] Level of Service (LoS) defined as the highest return period a pipe can convey without resulting in flooding upstream

A methodology was developed to determine the potential impacts of the retrofit Alternatives based on the indicators (JFSA, 2011). The method involved:

1. Point-of-discharge for SWM flows directly to Pinecrest Creek;
2. Determination of runoff hydrographs for specific storm events;
3. Determination of representative cross-sections for analysis;
4. Grain size analysis of bed materials along Pinecrest Creek; and
5. Calculating change in indicators according to targets outlined above through direct quantification with respect to cross-sections and flows.

Calculations were completed on the following parameters as part of the overall analysis (JFSA, 2011):

- **Discharge:** Average, minimum and maximum discharge results were determined from the hydrographs to interpret change in peak flows and average flows. Peak flow change affects impact forces and sediment transport, while average discharge over the course of the hydrograph indicates change to cross-sectional area (wetted flow area) for the storm event.
- **Velocity**: Average, minimum and maximum velocity was determined from the flows at each cross-section. Peaks and average conditions affect sediment transport and erosion potential.
- **Depth**: Average, minimum and maximum depths for each cross-section was assessed to determine change in cross-sectional area. Depth is the actual depth of flow during each flow event.
- **Boundary Shear Stress**: Average, minimum and maximum shear for the cross-sections was analyzed; this is a factor in erosion potential, channel stability and sediment regime and size. Critical shear stresses for entrainment were also determined for the representative grain sizes indicated above.
- **Erosion Potential**: Average, minimum and maximum erosion potential for each of the representative grain sizes was determined to assess transport function and deposition of material in the sections. Erosion potential is the product of velocity and the relationship between boundary shear stress and critical shear stress for entrainment.
- **Exceedance of Critical Velocity**: Average, minimum and maximum for each of the representative grain sizes indicated above was determined to assess transport function and deposition of material in the sections. Exceedance is the product of critical velocity for entrainment (according to the Komar equation) and the modeled velocity in the channel at the cross-sections.

Analysis was completed for each of the representative cross-sections for hydrographs representing each of the flow Alternatives (JFSA, 2011) and a summary is provided herein.

By virtue of the fact that the upstream catchment contained a SWMP (EoP 16) in the model and that pond is responsible for significantly attenuating frequent peak event flows, the impact of that pond on flows at the upper end of the creek is significant (JFSA, 2011). Additionally, the impact is also a function of the specific storm event (JFSA, 2011).

Results from *upstream sections* can be summarized as follows. For the 10 mm storm:

1. Peak discharge decreases from existing by values ranging from 40% (HP SWM) to 96% (HP SWM with EoP), while average discharge over the entire hydrograph decreases by between 77% to 82%;
2. In-channel velocities decrease by 30% to 33% for the average hydrograph condition and to between 11% to 22% for peak discharges;
3. Depth of flow decreases by approximately 45% for all Alternatives under the average discharge condition, and decreases by between 16% and 78% for the peak discharge condition;
4. Decrease in shear stress under the average discharge condition is relatively consistent at approximately 46%, while under the peak discharge condition decreases range from 16% to 78%;
5. Erosion potential decreases significantly under all Alternatives by about 60%; and
6. Exceedance of critical velocity decreases under all Alternatives, indicating a potential depositional environment for all grain sizes prevails under these flow conditions.

For the 25 mm storm, each of these patterns is repeated, though there is a slight difference in the magnitude of decrease.

As distance from the upstream SWM pond increases, the magnitude of effect from that pond decreases, though the impact of other measures becomes apparent in the results.

As a means of comparison, the same storm results are presented for a representative *downstream section*. Summary results for the 10mm storm show:

1. Decrease in average discharge is on the order of approximately 80% from existing and between approximately 40% and 60% for peak discharge;
2. Velocity actually increases under two Alternatives (Moderate and Public Only) as more flow is contained in the channel cross-section and access to floodplain roughness is limited;
3. Decreases in flow depth are significant and support the result in item 2 above;
4. Boundary shear stress decreases by about 50% to 60% under average flow conditions and between 17% and 35% under peak flow conditions;
5. Erosion potential decreases for all grain sizes in the analysis; and
6. Critical velocity decreases in all cases except under the Moderate and Public Only Alternatives.

As with the upstream section, the pattern of results is consistent at the 25 mm flow event.

Analysis of the full range of results indicates that there are impacts created by the implementation of the proposed SWM measures extending from the upstream limit of the exposed channel to the downstream culvert at the Sir John A. Macdonald Parkway (JFSA, 2011).

## 5.4 Evaluation of Alternatives

The Evaluation of Alternative Scenarios completed by JFSA (2011) addressed five main considerations including:

1. Project Objectives and Targets
2. Social and Cultural
3. Natural Environment
4. Timing and Ease of Implementation
5. Costing

Each consideration was covered by a group of criteria and indicators. An overall scoring method was established to best capture the benefits and/or limitations of each alternative (JFSA, 2011). The scores used for the individual indicators are listed in order of the scores for the most beneficial to the least beneficial results: high (=3), medium (=2), low (=1) or none (=0).

The 2011 JFSA evaluation was divided into two steps: a numerical scoring, followed by a comparison of the Timing & Ease of Implementation and Costing. The criteria groups, individual criteria, indicators, indicator rationale and explanation of the scoring used for each indicator are outlined in Table 5-4. Weighting per category is listed in Table 5-5.

**Table 5-4: Criteria and Scoring used for Alternative Evaluations (adapted from JFSA, 2011)**

| Category | Criteria | Indicators | Rationale | Scoring |
|---|---|---|---|---|
| **Project Objectives** | 1) Flood Risk | Flood risk | With potential infill and redevelopment, there is a need to ensure flood risk to public health and safety and to property is not increased. | Scenarios that have the potential to reduce flood risk along the creek corridor are scored high; scenarios which result in no change to the flood risk along the creek corridor are scored medium; and scenarios which increase the flood risk along the creek corridor are scored low. |
| | | Floodplain storage | Floodplain storage attenuates peak flows as the flood wave moves downstream through the system; maintaining this feature of the floodplain is important to avoid peak flow increases from future potential works within the corridor. | Scenarios which increase riparian storage volumes for 2 to 100 year events are scored high; scenarios which maintain existing conditions are scored medium; and scenarios which decrease riparian storage are scored low. |
| | 2) Erosion Impacts | Sediment regime and size | Sediment sources and sediment transport need to be maintained in dynamic equilibrium to control loadings to reaches. | Scenarios that result in either an increase or decrease in sediment transport/mobility of 10 percent from existing are scored high, those that result in an increase or decrease between 10 and 20 percent from existing are scored medium, those that result in an increase or decrease of greater than 20 percent from existing are scored low. |
| | | Channel stability | Channel stability is a function of time series flows and sediment regime, stabilizing bank features (e.g. woody vegetation, artificial hardening). | Scenarios that result in estimated change in cross-sectional area from existing of plus or minus 10% are scored high, those that result in estimated change in cross-sectional area from existing of plus or minus 20% are scored medium, and those that result in estimated change in cross-sectional area from existing of greater than 20% are scored low. |
| | | Erosion potential | Erosion potential needs to be reduced to more natural levels to stabilize and reduce erosion damage and loss of riparian/floodplain lands. Maintain channel stability to protect municipal and NCC infrastructure, to reduce annual maintenance costs and increase longevity of infrastructure. | Scenarios that reduce erosion potential, damage, and loss of riparian/floodplain lands are scored high, those that maintain channel conditions are scored medium, and those that increase erosion potential, damage, and loss of riparian/floodplain lands are scored low. |
| | | Aquatic habitat | Improve the quality and quantity of in-stream aquatic habitat. Improving the potential for a sustainable fishery is a longer term objective. | Scenarios which have potential to improve habitat and increase fishery potential are scored high; those which maintain existing conditions are scored medium; and those scenarios which decrease habitat and fishery potential are scored low. |
| | 3) More Natural Hydrologic Cycle | Peak flows and runoff volumes for the 10 mm and next 15 mm storms | Reduce flashiness of runoff from the watershed. An increase in the "flashiness" represents the loss of water storage capability of soils and vegetation due to urbanization.[1] Retaining the first 10 mm storm and detaining the next 15 mm, will results in lower peak flows and runoff volumes. | Scenarios with the greatest retention and detention of runoff from first 10 mm and next 15 mm respectively are scored high; scenarios that retain and detain some runoff from first 10 mm and next 15 mm respectively are scored medium; scenarios that retain and/or detain the least amount of runoff from first 10 mm and next 15 mm respectively are scored low. |
| | | Effective imperviousness (EI) | The degree of effective imperviousness can greatly impact the timing and amount of flows and pollutants entering the receiving watercourse. | Scenarios with the greatest decrease in effective impervious area from existing conditions are scored high; scenarios with some decrease are scored medium; those with little decrease in effective imperviousness are scored low; and those with no decrease are scored as none. |
| | 4) Water Quality | TSS, TP | Targets are linked to achieving fish community targets, aesthetics and non-eutrophic conditions and avoiding the creation of in-situ contaminant concerns. | Scenarios that reduce TSS by 25mg/L or more from existing conditions, attain a TP concentration of 0.03 mg/L and reduce the total yield of both TSS and TP are scored high; scenarios that attain two of those three targets are scored medium; scenarios that attain one target are scored low; and scenarios that achieve zero targets are scored as none. |

| Category | Criteria | Indicators | Rationale | Scoring |
|---|---|---|---|---|
| | 5) Runoff impacts on Westboro Beach | Instream *E.coli* (Ottawa River at Westboro Beach) | Setting targets to approach swimming beach PWQO in non-beach areas ensures that risks of contracting disease from incidental exposure to recreational waters are reduced (e.g. boating, water skiing, dock swimming) | Scenarios which result in at least 40% reduction in E. coli concentrations at Westboro Beach, or higher, are scored high; scenarios which result in at least 20% reduction in E. coli concentrations at Westboro Beach are scored medium; scenarios with less than a 20% but more than 0% reduction in *E.coli* concentrations at Westboro Beach are scored low; and scenarios with 0% reduction are scored as none. |
| | 6) Natural Features | Riparian vegetation | The Enviro. Canada Habitat Guideline recommends natural vegetation within 30 m of a watercourse be retained or re-established on both banks for 75% of its overall length. (Target was developed at a watershed level and may not be appropriate to or achievable within an urban subwatershed.) | Scenarios that increase riparian vegetation are scored high, those that maintain the existing vegetation are scored medium, and those that reduce the existing features are scored low. |
| | | Tree Canopy | Increased tree canopy in urban areas can reduce runoff volume by intercepting rainfall, particularly for small events. | Scenarios that increase tree canopy are scored high; scenarios that maintain canopy are scored medium; and scenarios that reduce it are scored low. |
| | 7) Public Awareness | Increased public awareness | Increased public awareness will lead to greater success and uptake of SWM Retrofit Plan recommendations. | Scenarios that involve a high level of public awareness are scored high; scenarios that involve a moderate level are scored medium; and scenarios that involve a low level are scored low. |
| | | Increased public involvement | Increased public involvement required for successful implementation of SWM retrofit. | Scenarios that involve a high level of public involvement are scored high; scenarios that involve a moderate level are scored medium; and scenarios that involve a low level are scored low. |
| **Social / Cultural** | Open Space / Parks | Adverse effects on parks and open space | Potential to have adverse effect on parks and open space. | Scenarios which have no adverse effects on parks and open space are scored as high; scenarios which have minimal adverse effects on parks and open space are scored medium; and scenarios which have the most adverse effects or remove parks and open space are ranked low. |
| **Natural Environment** | Terrestrial Systems | Impact on terrestrial habitat | Potential to impact terrestrial habitats or systems, including possible impacts on wildlife (including mammals, reptiles, birds) and terrestrial features/functions (including but not limited to designated features). This factor is intended to capture direct positive and negative impacts on natural terrestrial features, for example, by maintenance, physically building or habitat disturbances | Scenarios which Improve or have no impact on terrestrial habitats or systems are scored high; scenarios which have minimal impacts are scored medium; and those scenarios which have the most impacts on terrestrial habitats or systems are scored low. |
| | Aquatic Systems | Impact on aquatic habitat | Potential to impact aquatic habitats or systems, including possible impacts on aquatic life, features, and functions. This factor is intended to capture direct negative impacts through, for example, maintenance, physically building in or disturbing stream habitats, or wetlands. | Scenarios which improve or have no impact on aquatic habitats or systems are scored high; scenarios which have minimal impacts are scored medium; and scenarios which have the most impacts are scored low. |
| **Timing / Ease of Implementation** | Timing to Implement | Estimated implementation time | Length of time it will take until recommended retrofit strategy is implemented and operational. | Estimated time to implement shown per scenario. |
| | Degree of Control | Degree of implementation in public realm | Degree that the implementation of the scenario rests within the public realm in terms of: being maintained over time; authority to proceed. | Estimated time to implement shown per scenario. |
| **Economic** | Cost to Municipality and other Agency Landowners | Relative total cost | Total present value life cycle costs, which include operation and maintenance. | Estimated costs shown per scenario. |

| Category | Criteria | Indicators | Rationale | Scoring |
|---|---|---|---|---|
| | Cost to Private Landowners | Relative total cost of lot level component | Total present value life cycle costs for implementation of lot level measures | Estimated costs shown per scenario. |

**Table 5-5: Weight per Category**

| Category | Weight |
|---|---|
| **Project Objectives** | 75 |
| **Social / Cultural** | 10 |
| **Natural Environment** | 15 |
| **Timing / Ease of Implementation** | n/a |
| **Economic** | n/a |
| ***Total*** | *100* |

### 5.4.1 Costing of Alternatives

In order to compare the costs of the Alternatives, a 50 year lifecycle cost analysis was undertaken (JFSA, 2011). For the purposes of the lifecycle cost exercise, a discount rate of 5% was applied for the lifespan of the SWM measure or installation. This value was chosen by JFSA to provide an estimate of lifecycle costs for the various Alternatives and is not an indicator of what the average discount rate over the next 50 years will be.

For this cost analysis, the capital cost, replacement costs and maintenance costs of all lot level, conveyance and end-of-pipe facilities were taken into account. A summary of the 50 year lifecycle costs for each Alternative is presented in Table 5-6 (JFSA, 2011).

**Table 5-6: Summary of Total Scenario Costs for a 50 year Lifecycle (2010 dollars) (JFSA, 2011)**

| | Highest Practical SWM with EoP Facilities | Highest Practical SWM without EoP Facilities | Moderate SWM | Public Property Only |
|---|---|---|---|---|
| Present Value : Total Cost | $63,997,000 | $49,312,000 | $42,900,000 | $30,739,000 |
| Present Value : Maintenance Cost | $8,965,000 | $7,379,000 | $6,157,000 | $4,362,000 |
| Amortized : Maintenance Cost | $491,000 | $404,000 | $337,000 | $239,000 |
| Present Value : Capital Cost | $55,033,000 | $41,933,000 | $36,743,000 | $26,317,000 |
| Amortized : Capital Cost | $3,015,000 | $2,297,000 | $2,013,000 | $1,442,000 |

### 5.4.2 Scoring and Ranking of Scenarios

Weighting of the evaluation criteria was applied to the scoring of the Alternatives (JFSA, 2011). In total, the project objectives comprised 75% of the weighting due to the scope of the environmental concerns and social factors addressed by those objectives. Weighting within project objectives was based on the relative significance of the criteria and indicators with respect to achieving the desired target or outcome and the impact that the Alternatives could potentially have with respect to that indicator. For example, producing a more natural hydrologic cycle within Pinecrest Creek was a salient objective for the SWM retrofit plan (JFSA, 2011). The parameters indicative of a more natural hydrologic cycle were assigned a relatively high weighting. While flood risk is very important from the public safety point of view, none of the Alternatives are predicted to have any potential to increase flood risk, so less weight is assigned for flood risk than other criteria that are directly addressed by each Alternative. The remaining Social/Cultural and Natural Environment criteria comprise 25% of the weighting.

The weighted scores for each indicator were calculated as follows:

(weighted score) = (indicator score) x (weight)

The total score for each Alternative is the sum of the Alternative's weighted scores for each indicator, where High = 3, Medium = 2, Low = 1, and None = 0. The highest total score is the highest rank.

### 5.4.3 Results of Scenario Scoring and Selection of Preferred SWM Scenario

The results of the Alternative numerical scoring are presented in Table 5-7 (adapted from JFSA, 2011). The modelling and assessment results upon which the indicator scores are based are also included in Table 5-7. The Alternative scores and ranking are presented in Table 5-8 (JFSA, 2011).

**Table 5-7: Scenario Evaluation (Adapted from JFSA, 2011)**

| Category | Criteria | Indicators | Do Nothing - Maintain Existing Conditions: Result | *Score* | Highest Practical: Result | *Score* | Highest Practical with EoP: Result | *Score* | Moderate: Result | *Score* | Public Only: Result | *Score* | Weighting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project Objectives** | 1) Flood Risk | Flood Risk | No Change in Flood Risk | 2 | No Change in Flood Risk | 2 | Potential to Decrease Flood Risk | 3 | Potential to Decrease Flood Risk | 3 | Potential to Decrease Flood Risk | 3 | 5 |
| | | Flood Plain Storage | Maintains Flood Storage | 2 | Maintains Flood Storage | 2 | Maintains Flood Storage | 2 | Maintains Flood Storage | 2 | Maintains Flood Storage | 2 | |
| | 2) Erosion Impacts | Sediment Regime and Size | Maintains Existing Conditions | 3 | Significant Decrease | 1 | Significant Decrease | 1 | Significant Decrease | 1 | Significant Decrease | 1 | 3 |
| | | Channel Stability | Maintains Existing Conditions | 2 | Significant Decrease | 1 | Significant Decrease | 1 | Significant Decrease | 1 | Significant Decrease | 1 | 5 |
| | | Erosion Potential | Maintains Existing Conditions | 2 | Significant Decrease | 3 | Significant Decrease | 3 | Significant Decrease | 3 | Significant Decrease | 3 | 5 |
| | | Aquatic Habitat | Maintains habitat | 2 | Maintains habitat | 2 | Maintains habitat | 2 | Maintains habitat | 2 | Maintains habitat | 2 | 2 |
| | 3) More Natural Hydrologic Cycle | Peak Flows and Runoff Volumes for the 10 mm and next 15 mm storms | 10 mm Retention = 76 %, 15 mm Detention = 0 % | 1 | 10 mm Retention = 82 %, 15 mm Detention = 0 % | 2 | 10 mm Retention = 82 %, 15 mm Detention = 25 % | 3 | 10 mm Retention = 78 %, 15 mm Detention = 23 % | 3 | 10 mm Retention = 77 %, 15 mm Detention = 25 % | 3 | 15 |
| | | Effective Imperviousness (EI) | Change = 0 ha | 0 | Change = -124 ha | 3 | Change = -124 ha | 3 | Change = -55 ha | 2 | Change = -34 ha | 1 | |
| | 4) Water Quality | Total Suspended Solids (TSS)† and Total Phosphorus (TP)† | Change TSS = 0 %, Change TP = 0 % | 0 | Change TSS = -12%, Change TP = 13 % | 1 | Change TSS = -44 %, Change TP = -32 % | 2 | Change TSS = -37 %, Change TP= -26 % | 2 | Change TSS = -39 %, Change TP = -25 % | 2 | 15 |
| | 5) Runoff impacts | Instream *E.Coli* (Ottawa River at Westboro Beach) | 145 cts / 100mL (Change = 0%) | 0 | 113 cts / 100mL (Change = -22%) | 2 | 83 cts / 100mL (Change = -43%) | 3 | 92 cts / 100mL (Change = -37%) | 2 | 97 cts / 100mL (Change = -33%) | 2 | 15 |
| | 6) Natural Features | Riparian Vegetation | No Change in Vegetation | 2 | No Change in Vegetation | 2 | No Change in Vegetation | 2 | No Change in Vegetation | 2 | No Change in Vegetation | 2 | 5 |
| | | Tree Canopy | No Change in Canopy | 2 | No Change in Canopy | 2 | No Change in Canopy | 2 | No Change in Canopy | 2 | No Change in Canopy | 2 | |
| | 7) Public Awareness | Increased Public Awareness | Low Level | 1 | High Level | 3 | High Level | 3 | High Level | 3 | Low Level | 1 | 5 |

| Category | Criteria | Indicators | Do Nothing - Maintain Existing Conditions: Result | *Score* | Highest Practical: Result | *Score* | Highest Practical with EoP: Result | *Score* | Moderate: Result | *Score* | Public Only: Result | *Score* | Weighting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Increased Public Involvement | Low Level | 1 | High Level | 3 | High Level | 3 | Moderate Level | 2 | Low Level | 1 | |
| **Social / Cultural** | Open Space / Parks | Adverse effects on parks and open space | Minimal adverse effects | 2 | Minimal adverse effects | 2 | Most adverse effects | 1 | Most adverse effects | 1 | Most adverse effects | 1 | 10 |
| **Natural Environment** | Terrestrial Systems | Impact on terrestrial habitat | Minimal Impact | 2 | Minimal Impact | 2 | Most Impact | 1 | Most Impact | 1 | Most Impact | 1 | 7.5 |
| | Aquatic Systems | Impact on aquatic habitat | Minimal Impact | 2 | Minimal Impact | 2 | Minimal Impact | 2 | Minimal Impact | 2 | Minimal Impact | 2 | 7.5 |
| **Timing / Ease of Implementation** | Timing to Implement | Estimated implementation time | N/A | N/A | Significant Time Required | N/A | Significant Time Required | N/A | Moderate Time Required | N/A | Moderate Time Required | N/A | N/A |
| | Degree of Control | N/A | Completely in Public Domain | N/A | Slightly in Public Domain | N/A | Moderately in Public Domain | N/A | Moderately in Public Domain | N/A | Completely in Public Domain | N/A | N/A |
| **Economic** | Cost for works on public property (City, NCC, public institutions) | Total present value lifecycle costs | Costs (tangible and intangible) associated with existing water quality, flooding, erosion problems and beach closures. | N/A | $16,000,000 | N/A | $31,000,000 | N/A | $21,000,000 | N/A | $31,000,000 | N/A | N/A |
| | Cost for works on private property (residential and non-residential) | Total present value lifecycle costs | No cost | N/A | $33,000,000 | N/A | $33,000,000 | N/A | $22,000,000 | N/A | No cost | N/A | N/A |

† The values shown for existing conditions are the total yields (and percent change) of suspended solids and total phosphorus.

**Table 5-8: Alternative Numerical Scores and Ranking (JFSA, 2011)**

| Scenario | Overall Score | Rank | 50 Year Lifecycle Cost |
|---|---|---|---|
| Do Nothing - Maintain Existing Conditions | 116 | 5 | N/A |
| Highest Practical SWM without EoP | 195 | 2 | $49 M |
| Highest Practical SWM with EoP | 217 | 1 | $64 M |
| Moderate SWM with EoP | 192 | 3 | $43 M |
| Public Property Only with EoP | 177 | 4 | $31 M |

As would be expected, Highest Practical SWM with EoP Facilities has the highest numerical score and the Do Nothing option the lowest numerical score. Based on these scores, the Do Nothing Alternative was eliminated as it does not meet most objectives and targets.

The assessment and scoring process also revealed that with the full implementation of the remaining Alternatives there is a potential for adverse impacts on the Pinecrest Creek channel stability and the sediment regime.

The predicted impacts on Pinecrest Creek are based on the results of modelling the SWM ponds, including EoP16 (Baseline/Woodroffe SWMP), to optimize water quality benefits (JFSA, 2011). It was concluded that in order to address the potential creek impacts, the final configuration of the pond and its outflow will be designed to balance the water quality with the need to avoid destabilizing the creek (JFSA, 2011). However, in order to realize the greater water quality benefits, the EoP facilities would need to be part of the SWM retrofit implementation. Therefore, the preferred Alternative would be selected from the Highest Practical SWM with EoP, the Moderate and the Public Property Only Alternatives. This eliminated the Highest Practical without EoP Alternative.

Of the three Alternatives with EoP, the Public Property Only Alternative was eliminated based on its lower score and ranking.

The Timing & Ease of Implementation and Costing criteria were then considered for the selection of the Preferred Retrofit Alternative from the two remaining Alternatives: the Highest Practical SWM with EoP and the Moderate (JFSA, 2011).

- Timing to Implement: A more moderate amount of time is required for implementation of the Moderate Alternative as compared to the significant time of implementation required for the Highest Practical SWM with EoP Alternative.

- Degree of Control: The degree of control is comparable between the two Alternatives.
- Costing: The Highest Practical SWM with EoP Alternative has much higher projected costs than the Moderate SWM Alternative. In addition, the Moderate SWM Alternative has the potential of being more cost effective than the Highest Practical SWM with EoP Alternative based on the results versus targets achieved.

To determine the relative cost versus benefit ratio for each Alternative, the total costs were converted to a unit cost per kg, number of bacteria or $m^3$ of pollutant (TSS, Total Phosphorous (TP), E.coli, and Runoff Volume) removed (JFSA, 2011). Based on this analysis, the Moderate SWM Alternative is more cost effective than the Highest Practical SWM with EoP.

**Based on the results of this second step of the alternative evaluation, the Moderate SWM Alternative was selected as the preferred SWM Retrofit Scenario for the Pinecrest Creek/Westboro Study Area (JFSA, 2011).**

# 6. PREFERRED ALTERNATIVE

The Preferred SWM Retrofit Plan was determined to be the "Moderate SWM Scenario" (JFSA, 2011). The 2011 P/W SWM Retrofit Study identified EoP facilities at 4 locations. The proposed SWMP was identified as EoP 16 and as a wet pond at outlet 4305, where Pinecrest Creek starts to daylight north of Baseline Road. JFSA completed a Feasibility Study for the preferred Moderate SWM Alternative as detailed below (JFSA, 2015).

## 6.1 Southwest Transitway Design (2011)

JFSA (2015) describes an overview and brief analysis of the results presented by the Southwest Transitway design team in the winter of 2011. The SWM option for the Transitway was comprised of underground storage tanks to contain and release 4,000 $m^3$ of runoff from the Southwest Transitway Extension project (Baseline to Norice) under the north section of Transitway from Baseline Road to Navaho Drive (JFSA, 2015). The volume of water to be stored was calculated using the design criteria of the Pinecrest/Centrepointe Stormwater Management Criteria Study (JFSA, 2010).

JFSA determined that although the storage tanks would meet the design criteria, there were concerns regarding the estimated capital costs and about accessing and maintaining the tanks under an active Transitway (JFSA, 2015). A SWMP in the proposed location (Class EA Study Area) would provide a more suitable SWM solution for the Southwest Transitway Extension, and would provide more benefits for Pinecrest Creek (JFSA, 2015).

## 6.2 Requirements and Specifications

The SWMP specifications have been determined by JFSA as part of the 2015 Feasibility Study. These specifications have been dictated in part by the hydrology of the tributary area, existing sewershed infrastructure and by the SWM objectives the facility is to meet. This includes standard SWMP specifications set out by Ontario's Ministry of the Environment and Climate Change (MOECC) (formerly the Ministry of the Environment) and the results of the fluvial geomorphic analyses. The main components outlined are the wet pond requirements, the pond inlet and outlets, the forebay, the active storage characteristics, and maintenance and operations.

Additionally, the requirements for in-stream works and a description of how the interface between the proposed SWMP and the existing creek will look is provided (JFSA, 2015). This description from the 2015 Feasibility Study considers the physical and fluvial geomorphological characteristics of Pinecrest Creek given it is the receiving watercourse from the proposed pond. Refer to Appendix G for details.

## 6.3 Feasibility of the Preferred Alternative (JFSA, 2015)

The 2015 Feasibility Study completed background information and field investigations; analysis and impact assessment; concept designs; and costing. The analysis and assessment as well as the alternatives, as developed by JFSA for the Study Area, are presented below. The site information and constraints identified in Section 4, were taken into account in this work (JFSA, 2015).

### 6.3.1 Modelling Quantity and Quality Control

The analysis and impact assessments included modelling to assess the potential quantity and quality control that could be provided by the proposed SWMP and to assist in the assessment of the fluvial geomorphic impacts of the proposed pond. A set of scenarios (Existing Conditions; Southwest Transitway Extension with on-site Controls and no pond; Southwest Transitway Extension with no on-site controls and with the pond, etc.) were used for the assessments. The Southwest Transitway Extension drainage area modelled represented the ultimate extension to Hunt Club so as to provide a more conservative approach for the analysis.

The results of the modelling analysis and assessment (hydrologic and hydraulic) indicated that a surface SWMP constructed at the subject site, according to noted specifications, could meet the technical objectives, including:

- Receive runoff and provide a level of control for all storm events up to the 100-year, considering the interactions with Pinecrest Creek;
- Remove in excess of 60%, potentially close to 80%, of the suspended sediments from the collected runoff;
- Provide sufficient 100-year peak flow attenuation to provide a net peak flow reduction compared to the proposed underground tanks below the Southwest Transitway Extension; and
- Provide a reduction in erosion potential along Pinecrest Creek.

Therefore, it would be feasible to construct a surface SWMP at the subject site to meet these hydrologic and hydraulic objectives.

It was also noted in the fluvial geomorphic impact analysis that:

- Implementing the SWMP as proposed will create a minimal construction impact and that impact is mitigable at the inlet and outlet sites and may at this high level of assessment, result in some sedimentation upstream of the Iris Street culvert.
- The Iris Street culvert, the first main culvert crossing downstream of the proposed SWMP, is oversized for flows and also experiencing sedimentation under existing flows and sediment transport regimes. Removal of the fine sediment through operation of the pond will theoretically decrease the amount of in-channel sediment moving through the system and depositing at the culvert; however Pinecrest Creek continues to be a highly-erosive system with considerable adjustments to past flows, which have not stabilized. The decrease in flow energy through operation of the pond will lessen the existing erosion potential along the creek to a certain extent but it will not halt the erosion. Therefore, it is anticipated that during the initial operation of the pond there will be a corresponding decrease in sediment available for deposition at the Iris Street culvert, however the sediment that is removed from the system by the pond will eventually be picked up again from the bed and banks and a return to sedimentation conditions will occur at the culvert. That said, the decrease in flows will cut the in-channel erosion that will occur due to the loss of sediment in

the pond, and sedimentation at the culvert at Iris Street will be less than currently occurs.

The Pond discharge location and release rates should be revisited during detailed design based on updated modelling of the erosion thresholds in the creek t (JFSA, 2015).

## 6.4 SWMP Conceptual Design Options (JFSA, 2015)

JFSA produced two concept options for the SWMP, referred to as Option 1 and Option 2 (2a and 2b). Both options meet the appended requirements and specifications and accommodate the constraints identified in Section 4.7.1. The wet pond facility outletting to Pinecrest Creek has been designed to maximize water quality and flood control benefits while minimizing negative impacts to the fluvial geomorphic conditions of the creek.

### 6.4.1 Conceptual Design Option 1

Option 1 consists of one pond that contains the various SWMP components; inlet, forebay (cell 1), permanent pool, active storage area and outlets. An internal diversion berm located in the middle of the pond, along the pond's long axis, would provide separation to prevent the short-circuiting of water movement in the pond. Another berm would be located at the downstream end of the forebay.

There is one (1) inlet to the pond from the creek. The inlet is located approximately 10 m downstream of the Baseline Trunk Sewer outfall as prescribed. There are two (2) outlets: the low flow/quality control outlet and the quantity control outlet.

The elevation and approximate dimensions of Conceptual Design Option 1 pond features are outlined in Table 6-1.

**Table 6-1: Elevation and Approximate Dimensions of Conceptual Design Option 1**

| Feature | Dimensions (Approximate) | Elevation |
|---|---|---|
| **Forebay** | Bottom: 150 m long and 25 m wide<br>Maximum depth: 3 m | - |
| **Permanent Pool** | Area: 2 ha<br>Volume: 34,000 $m^3$<br>Maximum depth: 1.5 m, 3 m in forebay | 78.90 masl |
| **Diversion Berm** | - | 79.75 masl |
| **Forebay Berm** | - | Top: 78.70 masl |

| Feature | Dimensions (Approximate) | Elevation |
|---|---|---|
| **Active Storage** | When at 80.15 m, volume 27,500 $m^3$ | Fluctuates between 78.90 to 80.15 masl |
| **Inlet** | Equivalent to: 5 m x 1 m box culvert<br>Length: 34 m | Invert elevation: 79.00 masl |
| **Low Flow/Quality Control Outlet Pipe** | Equivalent to: 315 mm dia, circular orifice and a 450 mm diameter, 60 m long pipe | Invert elevation: 78.90 masl |
| **Quantity Control Outlet Box Culvert** | Equivalent to: 2.4 m x 1.2 m box culvert<br>Length: 75 m | Invert elevation: 79.61 m |

A maintenance route is included in the concept design.

The landscape features incorporated in Concept 1 include:

- **Landscaped areas around pond**: areas of meadow and mown grass, reforestation planting, large tree planting and shrub planting. Some of the existing vegetation is incorporated into the plan. The site would be re-graded, 1) to reduce the need for costly exporting of excavated materials from the site and, 2) to provide landforms used to screen surrounding commercial and residential development.
- **Realignment of recreation pathways**: Pathways will circumvent the pond and may provide for viewing across the pond and access to informal “activity” areas occur along the recreational path.
- **Pond**: edge of pond treatment includes placement of boulders at the edge of the water, geotextile and stabilization planting. Bioengineering techniques would be used to provide additional stabilization of the slopes.
- **Maintenance**: a maintenance plan would be developed to ensure the on-going sustainability of the landscape.

Concept Option 1 also addresses the site constraints and uses the opportunities identified in Section 4.7.

#### 6.4.1.1 Cost Estimate for Conceptual Design Option 1

Estimates of the capital costs (in 2012 dollars) to construct the Conceptual Design Option 1 SWMPincluding excavation costs, outlet and inlet construction, creek alterations costs and a budget estimate for landscape elements are identified in Table 6-2.

**Table 6-2: Cost Estimate for Conceptual Design Option 1**

| SWM Facility Component | Cost Estimate (2012 Dollars) |
|---|---|
| Pond Excavation and Construction | $4,640,000 |
| Edge of Pond Treatment | $152,000 |
| Landscaping of Surrounding Area | $2,308,000 |
| Relocation of Hydro Ottawa 13 kV for Option 1 | $760,000 |
| Inlet to Pond from Creek | $284,000 |
| Quality / Low Flows Control Outlet | $74,000 |
| Quantity Control Outlet | $184,000 |
| **Estimated Costs for Concept Option 1** | **$8,402,000** |
| 25% Contingency | $2,100,000 |
| **Total Estimated Cost with 25% Contingency** | **$10,502,000** |

A major cost associated with Option 1 is the relocation of Hydro Ottawa's buried 13 kV cables (2) to circumvent the pond.


**Figure 6-1: Landscape Concept - Option 1 (JFSA, 2015)**

### 6.4.2 Conceptual Design Option 2 (2a and 2b)

In Conceptual Design Option 2 (2a and 2b) the SWMP is divided into three (3) cells. The cells are organized to form the various SWMP components as follows: cell 1 is the forebay and part of the permanent pool, and cells 2 and 3 form the remainder of the permanent pool.

In Option 2a, cells 1 and 3 are connected to cell 2 by two (2) large buried culverts. In Option 2b the cells are connected by two (2) open channels with a recreational pathway bridge crossing over the channels. The buried Hydro Ottawa cables are accommodated through this separation of the three (3) pond cells. In Option 2a the connection culverts pass several metres below the cables.

The dimensions and elevations of Options 2a and 2b are presented in Table 6-3.

**Table 6-3: Elevation and Approximate Dimensions of Conceptual Design Options 2a and 2b**

| Feature | Dimensions (Approximate) | Elevation |
|---|---|---|
| Forebay | Bottom: 150 m long and 25 m wide<br>Maximum depth: 3 m | - |
| Permanent Pool | Area: 2 ha<br>Volume: 33,000 $m^3$<br>Maximum depth: 1.5 m, 3 m in forebay | 78.90 masl |
| Diversion Berm | - | 79.75 masl |
| Forebay Berm | - | Top: 78.70 masl |
| Active Storage | When at 80.15 m, volume 27,500 $m^3$ | Fluctuates between 78.90 to 80.15 masl |
| Option 2a Only: Buried Culverts Connecting Cells 1, 2 and 3 | Equivalent to: two 975 mm dia. circular<br>Length: 30 m | - |
| Option 2b Only: Bridge Over Open Channels Connecting Cells 1, 2, and 3 | Span: 20 m | - |
| Inlet | Equivalent to: 5 m x 1 m box culvert<br>Length: 34 m | Invert elevation: 79.00 masl |
| Low flow/quality control outlet pipe | Equivalent to: 315 mm dia, circular orifice and a 450 mm diameter, 35 m long pipe | Invert elevation: 78.90 masl |
| Quantity control outlet box culvert | Equivalent to: 2.4 m x 1.2 m box culvert<br>Length: 60 m | Invert elevation: 79.61 m |

A maintenance route is included in the concept design.

The landscape features incorporated in Concept 2 (2a and 2b) include:

- **Landscaped Area Around Pond**: Areas of meadow and mown grass, reforestation planting, large tree planting and shrub planting. Some of the existing vegetation is incorporated into the plan. The site would be re-graded, 1) to reduce the need for costly exporting of excavated materials from the site and, 2) to provide landforms used to screen surrounding commercial and residential development.
- **Realignment of Recreation Pathways**: Pathways pass in between the cells either across the causeway over the buried culverts (Option 2a) or across a bridge (Option 2b). Vistas are provided for viewing across the pond and informal "activity" areas occur along the recreation path.
- **Pond**: Edge of pond treatment includes placement of boulders at the edge of the water, geotextile and stabilization planting. Bioengineering techniques would be used to provide additional stabilization of the slopes.
- **Maintenance:** A maintenance plan would be developed to ensure the on-going sustainability of the landscape.

Options 2a and 2b also address the site constraints and uses the opportunities identified in Section 4.7.

#### 6.4.2.1 Cost Estimate for Conceptual Design Option 2 (2a and 2b)

Estimates of the capital costs (2012 dollars) to construct Conceptual Design Option 2a or 2b SWMP including excavation costs, outlet and inlet construction, creek alterations costs and a budget estimate for landscape elements are outlined in Table 6-4.

**Table 6-4: Cost Estimate for Conceptual Design Option 2 (2a and 2b)**

| SWM FACILITY COMPONENT | COST ESTIMATE (2012 DOLLARS) |
|---|---|
| Pond Excavation and Construction | $4,311,000 |
| Edge of Pond Treatment | $152,000 |
| Landscaping of Surrounding Area | $2,316,000 |
| **CONNECTION BETWEEN CELLS 1 AND 3 AND CELL 2** | |
| Option 2a – Buried Culvert Connection between Cells 1 and 3 and Cell 2 | $191,000 |
| Option 2b – Open Channel Connection with Bridge between Cells 1, 3 and 2 | $380,000 |

| SWM FACILITY COMPONENT | COST ESTIMATE (2012 DOLLARS) |
|---|---|
| Inlet to Pond from Creek | $284,000 |
| Quality / Low Flows Control Outlet | $69,000 |
| Quantity Control Outlet | $155,000 |
| **Estimated Costs for Concept Option 2a (buried culverts as cell connection)** | **$7,478,000** |
| 25% Contingency | $1,870,000 |
| **Total Estimated Cost for Option 2a with 25% Contingency** | **$9,348,000** |
| **Estimated Costs for Concept Option 2b (open channels with bridge)** | **$7,667,000** |
| 25% Contingency | $1,917,000 |
| **Total Estimated Cost for Option 2b with 25% Contingency** | **$9,584,000** |

The major cost differences between Options 2a and 2b are due to the bridge over the open channels and the rerouting of Hydro Ottawa's buried 13 kV cables (2) through the bridge, both required for Option 2b.

Hydro Ottawa has noted that taking the cable into the bridge would present security, maintenance and access issues, and therefore Hydro Ottawa does not consider that aspect of Option 2b to be feasible (JFSA, 2015).


**Figure 6-2: Landscape Concept - Option 2**

### 6.4.3 Stormwater Inlet and Outlet Connections to Pinecrest Creek

Connecting the proposed SWMP to Pinecrest Creek requires specific design elements. Flow exiting the quality and quantity pipes will undergo flow expansion at relatively high velocities during pond drawdown in response to storm events.

The existing "flashy" nature of of the Pinecrest Creek subwatershed's runoff response will be buffered to a certain extent by the pond. This means that as the pond drains, there will be less flow in the creek to diminish outlet velocities through mixing with creek flow. As a consequence, erosion of the outlet connection and local banks at the discharge points needs to be addressed.

Erosion is addressed through the nature of the connection relative to creek flow as well as through lining the outlet channel with stable stone material to limit/entrainment/erosion.

#### 6.4.3.1 Pond Outlets and Connection to Pinecrest Creek

The connection between the quality control outlet pipe and Pinecrest Creek will be made across a rock-lined channel segment which is blended into the existing banks of the creek. The width of the segment will be 1.0 m wide centered on the centerline of the culvert, with 0.275 m overlap on each side. This allows for protection from recirculation scour under conditions where the culvert is flowing at capacity. Where the outlet channel meets the creek the stone will be knitted into the existing bank and will make a smooth transition to the bed of the creek in order to minimize the potential for knickpoint development.

Based on the substrate sizing criteria for the quality control, the outlet channel should be comprised of rounded riverstone with a $D_{50}$ of 35 mm and a maximum diameter of 50 mm.

The connection between the quantity control outlet pipe and Pinecrest Creek will be made across a rock-lined channel segment which is blended into the existing banks of the creek. The width of the segment will be 4.80 m wide centered on the centerline of the culvert, with a 1.2 m overlap on each side. This allows for protection from recirculation scour under conditions where the culvert is flowing at capacity. Where the outlet channel meets the creek the stone will be knitted into the existing bank and will make a smooth transition to the bed of the creek in order to minimize the potential for knickpoint development.

Based on the substrate sizing criteria for the quantity control, the outlet channel should be lined with rounded riverstone with a $D_{50}$ of 160 mm and a maximum diameter of 175 mm.

Connection of the quantity and quality control outlet channels should be between 30 and 60 degrees to the flow so that the outlet flow is entering the channel in the downstream direction.

Figure 6-3 illustrates a schematic showing the general orientation of the outlet channel connections with Pinecrest Creek.

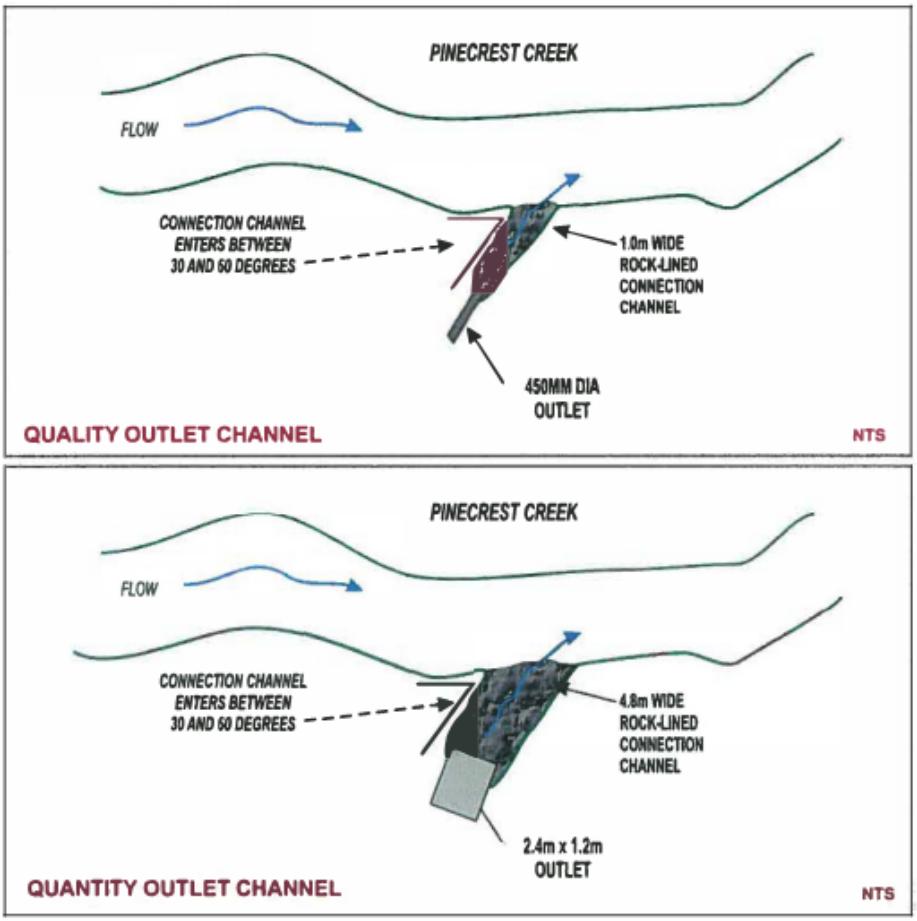



**Figure 6-3: General Orientation of the Outlet Channel Connections with Pinecrest Creek (JFSA, 2015)**

### 6.4.3.2 Rehabilitation of Creek Reach

All of the concept options require that the existing gabion basket wall on the east side of Pinecrest Creek be removed and the banks regraded to a natural configuration. This eliminates the long-term maintenance cost of the gabions and naturalizes the bank, removing the vertical drop between the top of the baskets and the bed of the creek.

# 7. PUBLIC CONSULTATION

## 7.1 Online Information Session

The first public consultation introduced the project, the EA process, existing conditions and constraints of the site, the pond options, and the next steps. This consultation was in the form of an online information session, where participants could read information about the project and provide feedback through a questionnaire. The session was available for viewing and feedback from November 3, 2016 until January 16, 2017.

The online information session material is provided in Appendix B and includes the notices and questionnaire.

### 7.1.1 Notification

Notice of the online information session was circulated through several forms of media, including:

- Email from the City of Ottawa project manager to those on the email list
  - *November 3, 2016*
- Project website
  - Ottawa.ca/baselinewoodroffepond
- City of Ottawa Planning and Development e-newsletter
  - *November 16, 2016*
- Local Newspapers:
  - Le Droit
    - *November 3, 2016*
    - *November 10, 2016*
  - Nepean-Barrhaven News
    - *November 3, 2016*
    - *November 10, 2016*

### 7.1.2 Participation

There were 98 responses to the online questionnaire, of which 55 noted their address. Figure 7-1 illustrates the distribution of participants and indicates that the majority of people who responded to the questionnaire and noted their address live in close proximity to the project area.


**Figure 7-1: Online Information Session Participant Distribution**

### 7.1.3 Comments and Questions

Viewers were provided the opportunity to fill out an online questionnaire at the end of reading the project information. As mentioned, there were 98 responses to the questionnaire. Figure 7-2 and Table 7-1 summarize the comments, concerns and values identified by participants. An “As We Heard It” report was generated which summarized the feedback received from the questionnaire and public meeting. This was posted on the project website and provided to all on the study mailing list.

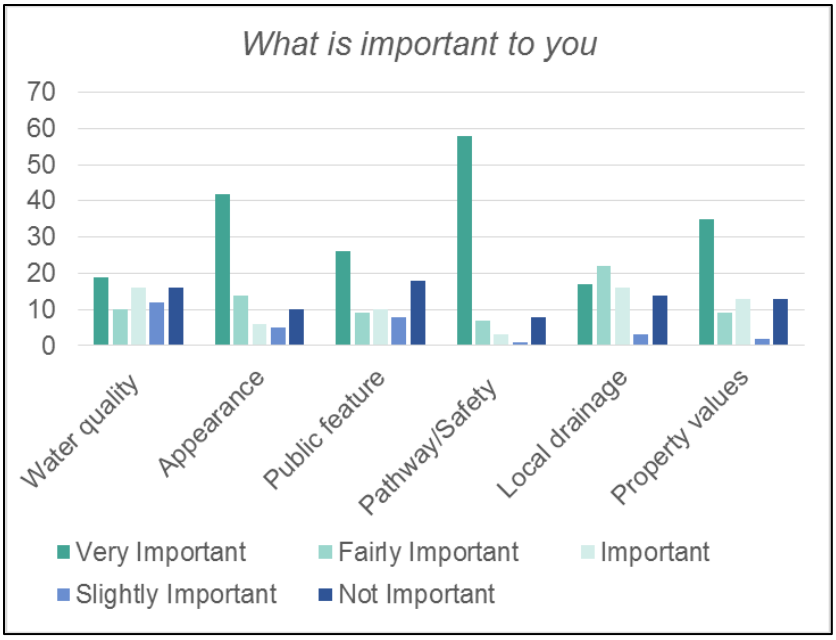



**Figure 7-2: Findings from What Is Important To You Survey in Questionnaire**

**Table 7-1: Summary of Comments and Responses from the Online Information Session**

| Comments and Concerns | Response |
|---|---|
| **Background Information and Decision Making Process**<br>Justification for the pond and its proposed location | This project is following through on the recommendations from the SWM Retrofit Study (2011) and Feasibility Study (2015), which describe the purpose, the stormwater management alternatives, and the evaluation of the alternatives, and are available for review at this link: http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html |
| **Consultation and Notification**<br>Insufficient and inadequate notification to date | In response to the comments received from the Online Consultation, this public meeting is being held to provide additional information and respond further to comments and concerns. All those on the study mailing list and all properties directly abutting the proposed site of the pond were directly notified in addition to ads placed in local newspapers. |
| **Recreation**<br>Protection and enhancement of pathways for pedestrians and cyclists<br>Opportunity for complementary community uses | When completed, pedestrian pathways will be incorporated and connected to City of Ottawa pathway and NCC Capital Pathway networks. Complementary community uses may be considered at the detailed design stage. |

| Comments and Concerns | Response |
|---|---|
| **Natural Environment and Creek Health**<br>Enhance the natural habitat for native wildlife and vegetation | The proposed options have taken into account the protection and enhancement of the creek. Landscaping will incorporate native species and provide natural greenspace and habitat. |
| **Safety, Human Health and Comfort**<br>Undesirable byproducts of stagnant water<br>Risks associated with an unsupervised body of water and the proximity to vulnerable populations | The pond will provide sufficient water movement (due to wind activity as well as continuous flow from a large inlet storm sewer) to discourage mosquitoes and avoid excessive odours.<br>Safety must always be addressed in any stormwater management pond that the City constructs. Typical approaches include clear signage at key locations regarding the function of the pond and the use of plantings to actively discourage access to the open water. Ponds are also provided with “gentle” side slopes near and below the water surface. In a worst case scenario, if someone does slip and fall into the water, the flatness of the slope and the shallow water depths near the edge of the pond ensure one can readily climb out. |
| **Pond Operation and Drainage**<br>Concern that existing drainage issues will worsen<br>Maintenance of pond | The site will be re-graded and drainage will not negatively impact adjacent properties. The City will be responsible for regularly maintaining the facility and ensuring that it functions properly. |
| **Property and Residences**<br>Decreased property values<br>Concern that litter will worsen | Based upon experience with SWM ponds throughout the City, the environmental, aesthetic, and recreational benefits of these types of facilities have made them valued community assets. |

## 7.2 Public Meeting # 1

The second public consultation introduced the same concepts as the online information session, as well as a discussion of the concerns raised by the public to that point. This consultation was in the form of a public meeting which allowed attendees to learn about the project by circulating to view exhibits, listen to and view a presentation, speak with project team members one-on-one, and ask questions to the project team as a panel. Copies of the online questionnaire were available for attendees to complete and return to the project team.

The public meeting was held in the Council Chambers at Ben Franklin Place on January 9, 2017.

The public meeting material is provided in Appendix B, and includes the notices, PowerPoint presentation, project information bulletin, display boards, and questionnaire.

### 7.2.1 Notification

Notice of the public meeting was circulated through several forms of media, including

- Email from the City of Ottawa project manager to those on the email list
  - *December 15, 2016*
- Direct mail-out to all properties abutting the site of the proposed pond
- Project website
  - Ottawa.ca/baselinewoodroffepond
- City of Ottawa Planning and Development e-newsletter
  - *December 19, 2016*
- Local Newspapers:
  - Le Droit
    - *December 15, 2016*
    - *January 5, 2017*
  - Nepean-Barrhaven News
    - *December 15, 2016*
    - *January 5, 2017*

When asked in a follow-up survey how they had heard about the public meeting, 8 attendees responded. The majority of the attendees who responded to the survey indicated that they were notified by direct mail out (see Figure 7-3).

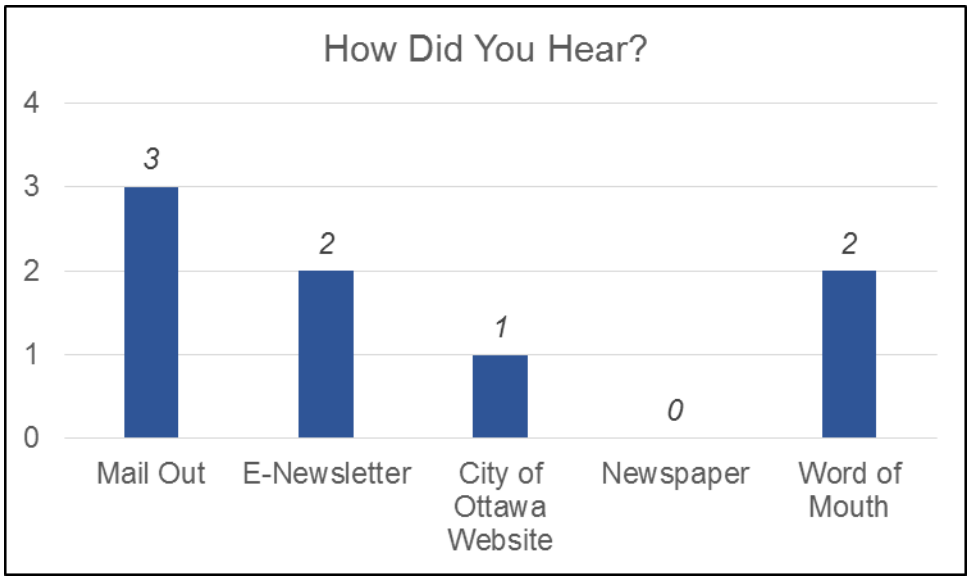



**Figure 7-3: Methods of Notification for Public Meeting**

### 7.2.2 Participation

There were 49 people who signed in at the public meeting. Figure 7-4 illustrates the distribution of attendees and indicates that the majority of people who attended the public meeting live in close proximity to the project area.


**Figure 7-4: Public Meeting Attendee Distribution**

### 7.2.3 Public Meeting Format

The format of the public meeting allowed for informal circulation to view a total of 9 display boards exhibiting information about the study. Members of the project team were available to respond to questions, comments, and concerns on a one-on-one basis. The following is a list of display boards that were available for viewing (boards are provided in Appendix B):

- Welcome
- The Project
- Process
- Drainage Area
- Site Constraints and Opportunities
- Pond Option 1
- Pond Option 2
- Next Steps

All display boards were posted on the project website for viewing in advance of the public meeting.

A project information bulletin was also available to each attendee that summarized the information being presented and discussed at the public meeting. The bulletin is provided in Appendix B.

A PowerPoint presentation was presented to the public by both the Study Team Project Coordinator, Karyn Cornfield, and the City of Ottawa Project Coordinator, Darlene Conway. The presentation is provided in Appendix B.

Following the presentation, the public was invited to ask questions to the project team panel, which included:

- Darlene Conway, P. Eng. – City of Ottawa Project Coordinator
- Eva Spal, P. Eng. – City of Ottawa Stormwater Infrastructure Operations
- Karyn Cornfield, P. Eng. – Morrison Hershfield Study Team Project Coordinator
- Kelly Roberts, HBSc. – Morrison Hershfield Environmental Planner
- Heather Wilson, P. Geo. – J. F. Sabourin and Assoc. Project Technical Lead: Hydrogeology
- Colin Brennan, P. Eng. – J. F. Sabourin and Assoc. Project Technical Lead: Water Resources

### 7.2.4 Comments and Questions

A hard copy of the online questionnaire was available to attendees, who were asked to submit completed questionnaires before January 16, 2017 in conjunction with the online questionnaire submission deadline. The questionnaire is provided in Appendix B.

An As We Heard It summary report was posted on the project website following the public meeting and was provided to all on the study mailing list. This document summarized the questionnaire results, the question and answer period of the public meeting (provided in Appendix B) and additional questions and comments forwarded to the City after the public meeting.

A summary of the Question and Answer period and the comments received at and after the public meeting is provided in Table 7-2.

**Table 7-2: Summary of Key Comments and Responses from Public Meeting**

| Comments and Concerns | Response |
|---|---|
| Safety and Health | The pond will provide sufficient water movement (due to wind activity as well continuous flow from a large inlet storm sewer) to discourage mosquitoes and avoid excessive odours.<br>While stormwater management ponds are designed to minimize habitat that is conducive to mosquitoes, it cannot be completely eliminated, particularly at the shallower edges of ponds. The City's experience to date with 100+ other wet ponds indicates excessive mosquitoes (over and above what is currently experienced on the Baseline/Woodroffe site) should not result. However, the application of larvicide to the pond would be undertaken if necessary to respond to this issue over the life of the pond.<br>Safety must always be addressed in any stormwater management pond that the City constructs. Typical approaches include clear signage at key locations regarding the function of the pond and the use of plantings to actively discourage access to the open water. Ponds are also provided with flatter side slopes near and below the water's edge. The flatness of the slope near the pond edge provides that a person can navigate the slope should there be a need to. The City has considerable experience with these facilities in urban areas and is committed to providing a safe environment around the pond through proper design and maintenance.<br>The proposed pond and associated landscaping will be designed to expressly discourage waterfowl from frequenting the site. |

| Comments and Concerns | Response |
|---|---|
| Alternatives to Pond | This project is following through on the recommendations of the SWM Retrofit Study (2011) and Feasibility Study (2015), which describe the purpose, the stormwater management alternatives, and the evaluation of the alternatives. These studies are available at this link: http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html<br>Private properties were screened out. Only public properties were considered due to high costs associated with acquiring private property.<br>A wet pond was the only type of pond considered, because it is most effective at improving water quality. Dry ponds can re-suspend sediments that have settled out from previous storm events.<br>The proposed pond is only one part of a longer-term solution for the whole of the Pinecrest Creek subwatershed and adjacent Westboro area. The City is also taking steps to implement other approaches to mitigate the impacts of urban runoff on receiving streams. Pilot projects implementing bioretention (or “rain gardens”) have recently been implemented on Sunnyside Avenue in old Ottawa South and Stewart Street in Sandy Hill. Further efforts within the Pinecrest Creek subwatershed include:<br>Hemmingwood Way: A number of bioretention features are proposed in conjunction with forthcoming area traffic management measures. These are now in design and will be constructed in 2018.<br>Outreach: A further initiative is being launched this spring/early summer that will focus on outreach efforts to educate residents about stormwater management and encourage homeowners to take action to reduce runoff from their properties. |
| Purpose of the Pond | The pond will mitigate the on-going impacts to Pinecrest Creek of urban development that occurred for many decades prior to the requirement to implement stormwater management. The primary purpose of the pond is to improve the water quality of runoff from the catchment area and reduce erosion downstream by storing and releasing this runoff more slowly. There are also flooding concerns in the creek, particularly where the creek was enclosed (piped) just south of Carling Avenue. This piping occurred during the 1960s and has resulted in a relatively high flood risk to the Sir John A. MacDonald Parkway (SJAMP). While the pond cannot be made large enough to eliminate the flood risk to the SJAMP at this location, it will provide some benefit in reducing the extent of flooding during major storm events. |

| Comments and Concerns | Response |
|---|---|
| Damage to private property | The proposed pond will not result in increased flood risk to adjacent properties under current or future climate conditions. Existing homes that abut the site of the proposed pond are well above the maximum (100yr) water level in the pond of 80.15m. For example, as shown on the cross-sections of the pond option drawings (refer to the Feasibility Report, 2015), the existing elevation at the rear property line of Field Street homes is about 85.0m. Conservatively assuming no further increase in grade of the house, the basements of these homes would not be below 82.0m - still well above the maximum pond level of 80.15m. Also, the design of the inlet to the pond will preclude the maximum water level from rising any higher, as excess flows will bypass the pond and continue downstream. |
| Wildlife and Habitat | The City and the NCC will work together to ensure that this project is not likely to cause significant adverse effects to all listed species under the federal Species at Risk Act. Mitigation measures to arrive at that result will be determined through the environmental review of this project under section 67 of the *Canadian Environmental Assessment Act*, 2012. |
| Pond Design and Details | The permanent water depth will be a maximum of 3m (in the pond "forebay"), and 1.5m for the rest of the pond. During a 100 year storm event, the water level would rise up to 1.25m above the permanent water level and would cover the peninsula shown in Option 1 During more frequent storm events, the peninsula would also be inundated.<br>The design of the inlet to the pond will preclude the maximum water level from rising any higher than about 1.5m above the permanent water levels as excess flows will bypass the pond and continue downstream.<br>Given the size of the drainage area to the pond (400+ha), it is anticipated there will be continuous flow to the pond,<br>The preliminary geotechnical assessment included boreholes and measured the groundwater level. The Feasibility Study deemed a pond liner unnecessary but this will be confirmed during detailed design based upon further geotechnical work.<br>The remaining existing storm sewer outlets downstream of the pond will continue to discharge to the creek. Additional SWM retrofit measures recommended by the Retrofit Study (2011) will be implemented over time to address the uncontrolled runoff from these outlets. |
| Pathway Connections | When completed, pedestrian pathways will be incorporated and connected to the City of Ottawa pathway and NCC Capital Pathway networks. |

| Comments and Concerns | Response |
|---|---|
| Lack of Sufficient Consultation | In hindsight, residents abutting the proposed pond location should have received greater notice in 2009/2010 when the Retrofit Study (2011) was being completed. Unfortunately, newspaper ads, Open Houses and other efforts completed were the typical public consultation approach at the time.<br><br>The 2015 Feasibility Study did not include public consultation as it was not yet certain whether NCC, as the owner of the property, would ultimately permit the construction of the SWM pond. If NCC were to object, there would have been no need to pursue the pond further. Once NCC confirmed their acceptance of the pond based upon the concept provided in the Feasibility Study, the City was able to proceed with a Class Environmental Assessment, including public consultation.<br>Given the feedback received from the November 2016 Online Consultation, a Public Meeting was arranged for January 9, 2016 and the original deadline for comments extended to January 16, 2017. Public meeting notices were mailed to all properties abutting the proposed pond site.<br><br>St. Daniel's school and the Ottawa Carleton School Board (OCSB) were consulted during the Feasibility Study and did not object to the proposed pond. They were also notified of the Online Consultation and subsequent public meeting, The OCSB has provided comments to the City. |
| Pond maintenance (dredging) | All stormwater management facilities owned and operated by the City (100+ wet ponds) are subject to regular maintenance to ensure continued performance and address concerns as they arise. Each pond requires an Environmental Compliance Approval (ECA) from the provincial Ministry of Environment and Climate Change which has conditions requiring regular inspection and maintenance.<br><br>The pond will require dredging approximately once every 10 years. This work will be undertaken during winter months. |

## 7.3 Public Meeting # 2

A second public meeting was held to expand upon the response presented at Public Meeting #1 and to present refinements made based on the comments received. This consultation was in the form of a public meeting which allowed attendees to learn about the project by circulating to view exhibits, listen to and view a presentation, speak with project team members one-on-one, and ask questions to the project team as a panel. A questionnaire was available for attendees to complete and return to the project team.

The public meeting was held at St. Paul High School (2675 Draper Avenue) on May 17, 2017.

The public meeting material is provided in Appendix B, and includes the notices, PowerPoint presentation, display boards, and questionnaire. The As We Heard It report from Public Meeting #1 was also available in hard copy for attendees.

### 7.3.1 Notification

Notice of the public meeting was circulated through several forms of media, including

- Email from the City of Ottawa project manager to those on the public and stakeholder email lists
  - *May 4, 2017*
  - *May 15, 2017*
- Direct mail-out flyer to all properties abutting the site of the proposed pond
  - *Week of May 8, 2017*
- Project website
  - Ottawa.ca/baselinewoodroffepond
- Local Newspapers:
  - Le Droit
    - *May 11, 2017*
  - Nepean-Barrhaven News
    - *May 11, 2017*

When asked in a follow-up survey how they had heard about the public meeting, the majority of the attendees who responded to the survey indicated that they were notified by email from the City project manager (see Figure 7-5).

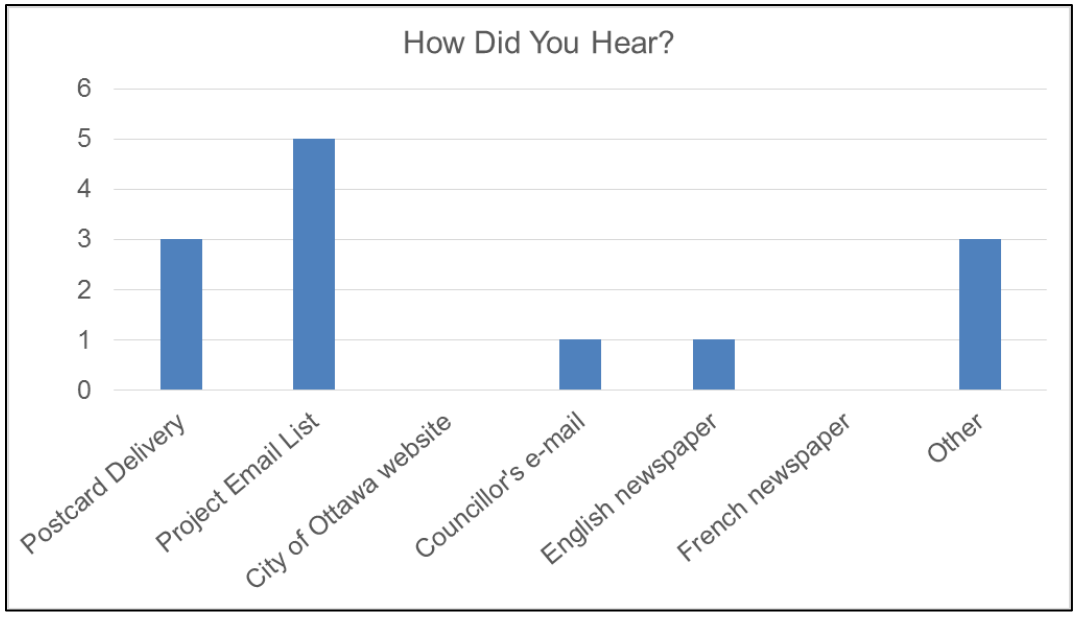



**Figure 7-5: Methods of Notification for Public Meeting #2**

### 7.3.2 Participation

There were 34 people who signed in at the public meeting. Figure 7-6 illustrates the distribution of attendees and indicates that the majority of people who attended the public meeting live in close proximity to the project area.

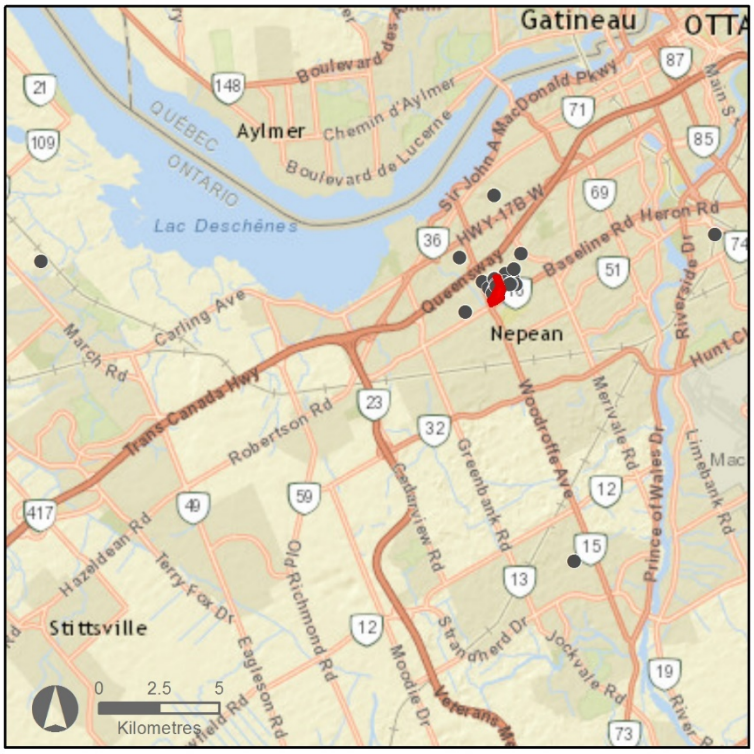



**Figure 7-6: Public Meeting #2 Attendee Distribution**

### 7.3.3 Public Meeting Format

The format of the public meeting allowed for informal circulation to view a total of 18 display boards exhibiting information about the study. Members of the project team were available to respond to questions, comments, and concerns on a one-on-one basis. The following is a list of display boards that were available for viewing (boards are provided in Appendix B):

- Welcome
- Process
- Need for a SWM Pond
- A Must-Have Project
- Drainage Area
- Site Constraints and Opportunities
- Pond Option 1
- Pond Option 2
- Comments and Responses (English and French board)
- Refinements
- Pond Modifications

- Preliminary Revised Concept
- Cross Section – Offsets from Basements and Properties
- Airport Zoning Regulations
- Transport Canada
- Design Features to Mitigate Bird Risks
- Next Steps

A PowerPoint presentation was presented to the public by Charles Wheeler, the Deputy Program Manager for the Confederation Line Extension of the Stage 2 LRT Project. The presentation is provided in Appendix B.

Following the presentation, the public was invited to ask questions to the project team panel, which included:

- Darlene Conway, P. Eng. – City of Ottawa Project Coordinator
- Karyn Cornfield, P. Eng. – Morrison Hershfield Study Team Project Coordinator
- James Fookes, P. Eng. – Morrison Hershfield Lead Designer
- Kelly Roberts, HBSc. – Morrison Hershfield Environmental Planner
- Heather Wilson, P. Geo. – J. F. Sabourin and Assoc. Project Technical Lead: Hydrogeology
- Sheri Edwards – CSW Landscape Architects Limited

### 7.3.4 Comments and Questions

A hard copy of a City of Ottawa comment sheet was available to attendees.

A summary of the Question and Answer period and the comments received at and after the public meeting is provided in Table 7-3.

**Table 7-3: Summary of Key Comments and Responses from Public Meeting**

| Comments and Concerns | Response |
|---|---|
| Pond Performance | The pond is required to improve water quality, reduce erosion and flooding in Pinecrest Creek from existing development upstream of Baseline and to mitigate the runoff impacts of the future Baseline LRT Station. Incremental benefits may also be realized downstream at the Ottawa River. The pond is anticipated to achieve 70% to 80% TSS removal. |
| Public Safety | An East-West pathway connection will cross the pond providing a safe, direct and clearly defined route across the site. Although the existing pathways are not cleared of snow in the winter, a request was made to maintain the pedestrian crossing of the pond in winter so that pedestrians would be clearly directed to cross in this location. Signage and thick dense plantings, around the pond will help discourage anyone from accessing the pond. A submerged, shallow aquatic bench will be provided around the perimeter of the pond to reduce the risk of falling into deep water. A request was made to provide a safety barrier/fence to “funnel” or direct pedestrians/school children to the crossing and further discourage crossing the frozen pond surface in winter. |
| Bird Hazards | In response to the risk that the project could attract geese/gulls to areas within the Airport’s bird hazard zone, the City retained a wildlife management expert to assess the risk and provide design recommendations to discourage geese/gulls. The risk assessment indicates no significant increase in risk given the pond location and relative elevation of birds and airplanes at this location. Design features include long linear pond, tall and dense plantings, and minimal manicured areas. Monitoring will be ongoing, and contingencies such as egg oiling/addling implemented if necessary. Clear signage will help deter the public from feeding the birds. |
| Mosquitoes | The pond will have sufficient wind and water movement over much of the pond surface that will help limit mosquitoes. An increase in mosquitoes is not anticipated based on the experience with many other wet ponds in the City. However, should mosquitoes become a concern, larvicide would be applied. A concern was raised that local residents might have to pay for the application of larvacide but it was confirmed there would not be additional charge to local residents. |

| Comments and Concerns | Response |
|---|---|
| Maintenance | Approximately once every 10 years the sediment in the forebay will be dredged in winter. The sediment will be stored on site to dry and then either trucked away for disposal or regraded and reseeded. Odours should not an issue in winter due to frozen conditions. The anticipated sediment loading and accumulation was requested by one resident and these numbers will be provided. |
| Underground Storage | A number of attendees inquired about switching from a wet pond to underground storage. This was not an option given the cost to construct an underground tank to achieve the same benefits as the wet pond would be $10's of millions more than the cost of the wet pond. |
| Location of Meeting | It was commented that the meeting location was too far outside the community and closer locations (St. Daniel's school) should have been considered. Lack of other available sites was the reason for having the meeting at St. Paul's school, which is approximately 3km from the proposed pond location. |

# 8. REFINEMENT OF THE PREFERRED ALTERNATIVE

## 8.1 Refinements

Options 1 and 2 were presented to the public and Option 1 was identified as the preliminary preferred alternative based on input received from key stakeholders during previous consultations. Key considerations were:

- more natural design
- less expensive (avoids relocation of hydro)
- single pathway alignment and would require less pathway maintenance.
- longer travel length for water quality settlement

Input received subsequently from stakeholders and the public has resulted in modifications and refinements as outlined below.

### 8.1.1 Connectivity

The public expressed concern regarding a pathway on a single side of the facility. Existing desire lines bisect the site and children cross from Baseline Road to the back of the school. The request from the neighbourhood to have the ability to cross the facility resulted in a reconsideration of Option 2.

Due to concerns raised by residents about the privacy of pathways in Option 2, the eastern-most pathway has been shifted west to provide an increased setback from residential properties.

### 8.1.2 Species at Risk

One butternut tree was originally identified in the previous study. Additional confirmatory studies were completed and fifty six (56) Butternut trees (*Juglans cinerea*) were further identified in the area. Under the Species At Risk Act (S.C. 2002, c. 29), all Butternuts found on federal property are protected, unless they are determined to be hybrid. Hybridity testing will be undertaken when field conditions permit, to confirm the genetic status of the trees.

As a precautionary approach, a 50m buffer has been applied to the single mature butternut (not a hybrid) on the site, and an appropriate buffer will be applied to all other true butternuts on site. The landscaping and pathway relocation that was originally proposed on the eastern portion of the site has been substantially reduced to avoid butternut tree impacts. However, the relocated pathway and the pond grading may encroach on some of these buffers. Appropriate mitigation techniques will be applied to reduce impacts to these individual trees.

The Monarch is protected under the federal *Species at Risk Act* (SARA).It's status was elevated by COSEWIC to Threatened Species in December 2016 but is still currently listed as Special Concern under the federal *Species at Risk Act*. The landscaping plan will include plants which have breeding and nectaring habitat opportunities such as milkweed.

### 8.1.3 Bird Hazard

An assessment of the potential bird hazard and risk to aircraft operating at Ottawa MacDonald Cartier International Airport (the Airport) with respect to a proposed stormwater management pond was completed by Beacon Environmental and is summarized below (Appendix H).

The following provides an assessment of the potential bird hazard and risk associated with the location and design of the SWM pond, as well as comments on design elements that can be incorporated to mitigate the use of the facility by birds. For a wildlife risk assessment, a hazard can be of two general categories:

- A 'wildlife hazard' refers to the one or more birds or mammals that might be struck by an aircraft
- A 'habitat hazard' refers to the land-use that attracts birds or mammals to areas through which aircraft operate. It is an antecedent condition of a wildlife hazard. Habitat hazards have a direct effect on the exposure of aircraft to birds or mammals.

The risk for bird-aircraft interactions, a bird strike, increases when the birds occur in airspace that is frequently used by aircraft operating to and from the Airport. The greatest risk occurs when birds occur on airside lands at the Airport, particularly within the area of the runways. Movements of local breeding geese tend to be short transit flights below 500' Above Ground Level (AGL), and are infrequent.

Though the SWM Pond is located within the airports Primary Bird Hazard Zone (PBHZ), it is located significantly distant from Runway 14-32 so that aircraft operating at this runway would be above 1,000' AGL when over the location the SWM Pond, an airspace that is not frequently inhabited by local movements of birds. Therefore, the likelihood or risk of a bird strike with birds at the SWM Pond is significantly reduced. The SWM Pond in this location does not pose a ***significant*** increase in the risk of a bird strike occurring for aircraft operating at the airport.

With respect to the number of birds that can occur at the new SWM Pond, generally the larger the surface water area of a facility the greater number of birds can be expected to occur. SWM Ponds that have a pond surface area of 5 or more hectares can support hundreds of roosting gulls and geese. Numbers of breeding pairs of geese that can be associated with a SWM Pond depends on two factors, the area of adjacent open space that can be used as nesting and feeding sites, and the surface area of shallow water associated with a pond. Most SWM Ponds that support a 2-3 ha permanent pond can support up to 10 breeding pairs of geese, with 50 to 60 juvenile birds in the late summer/early fall. Ponds with a permanent surface area below 2 ha are preferred by Transport Canada as they generally support fewer birds.

To mitigate the potential for increased risk, it is necessary to design the pond such that it avoids creating a SWM Pond that functions as a highly attractive feeding and breeding site for gulls and geese. The following design mitigation measures have been incorporated into the proposed SWM Pond.

- Maintaining a permanent depth of water (a wet pond) is a required design feature for achieving the water quality goals of the facility. Therefore a dry pond design is not feasible so the surface area of the permanent pond has been made as small as possible, and as narrow and linear as possible
- To reduce feeding habitat deep standing water is better than shallow water, and steep, deep shorelines
- A shoreline depth of 1 m or greater is recommended to reduce the growth of submergent and emergent aquatic vegetation as this can make a SWM Pond less attractive to gulls and geese. However, it is our understanding that this SWM Pond design must provide a shoreline aquatic bench of 0.3 m and/or flatter sloping above and below the permanent water level which is required by the City and the MOECC for public safety purposes.
- In-pond berms and dykes are highly attractive as nesting sites for Canada Geese and are used as loafing sites by both geese and gulls. Where an in-water berm is required to address water flow requirements through a pond, as is the case with this design, the physical makeup of the berm has been designed to be less attractive with dense planting with shrubs on the berm.
- A nearshore landscape design has been incorporated around the pond edge. This area should be comprised of a dense planting of shrubs to prevent birds from walking into the pond (ex. Common Blackberry (*Rubus allegheniensis*) and Smooth Wild Rose (*Rosa blanda*).
- The SWM pond is proposed within a relatively large open space area, over 10 ha, through which the Experimental Farm pathway currently runs. Due to public use of the lands the current landscaping design for the open space is to create a natural park like area with the plantings of trees, shrubs and grass meadows. Both geese and gulls are highly attracted to maintained park lawns for feeding and loafing. Therefore the area of maintained lawn will be limited to the 1.5 m mow strips along the pathway.

The refinements that resulted from the bird hazard risk assessment were presented to Transport Canada at a meeting with the Project Team on May 2, 2017. Final meeting minutes will be provided once finalized, and Transport Canada will prepare a response to the proposed design.

## 8.2 Preferred Alternative

The preferred alternative (Figure 8-1) includes the following key features

- Landscaped Area Around Pond: Areas of meadow, reforestation planting, large tree planting and shrub planting. Some of the existing vegetation is incorporated into the plan for both aesthetics and wildlife management.
- Realignment of Recreation Pathways: A pathway (causeway) crosses the pond over the buried culverts. Vistas are provided for viewing across the pond and informal “activity” areas occur along the recreation path. Connections are made to existing desire lines with connections to the school.
- Pond: Edge of pond treatment includes placement of boulders at the edge of the water, geotextile and stabilization planting. Bioengineering techniques would be used to provide additional stabilization of the slopes and deter waterfowl access.

- Maintenance: A maintenance route is included in the concept design that is integral with the pathway system. A maintenance plan would be developed to ensure the growth of new plantings.
- Design/Operating Elements: Table 8-1 identifies the key design elements.

**Table 8-1: Key Design Elements**

| Feature | Dimensions (minimum required MOE 2003) |
|---|---|
| Forebay | Min L:W = 2:1<br>Min. depth: 1m<br>Cleanout frequency: +/- 10yrs |
| Permanent Pool | Max Depth: 3m<br>70% TSS removal Volume = 25,223 $m^3$<br>80% TSS removal Volume = 51,907 $m^3$<br>Goal: Provide as much permanent storage as is feasible given space constraints. |
| Extended Detention | Extended detention volume (40$m^3$/ha * 446.04 ha): 17,842 $m^3$ |
| Forebay berm | Between 0.15 m and 0.3 m below permanent pool |
| Active (flood control) storage | Project goal: Provide as much active storage as is feasible given space and hydraulic constraints. |
| Inlet | Minimum diameter: 450 mm (to avoid freezing) |
| Low flow / quality control outlet pipe | Minimum diameter: 150mm (reverse sloped)<br>Minimum diameter: 75mm for orifice control |
| Quantity control outlet box culvert | Minimum diameter: 450 mm (to avoid freezing) |


**Figure 8-1: Preferred Alternative**

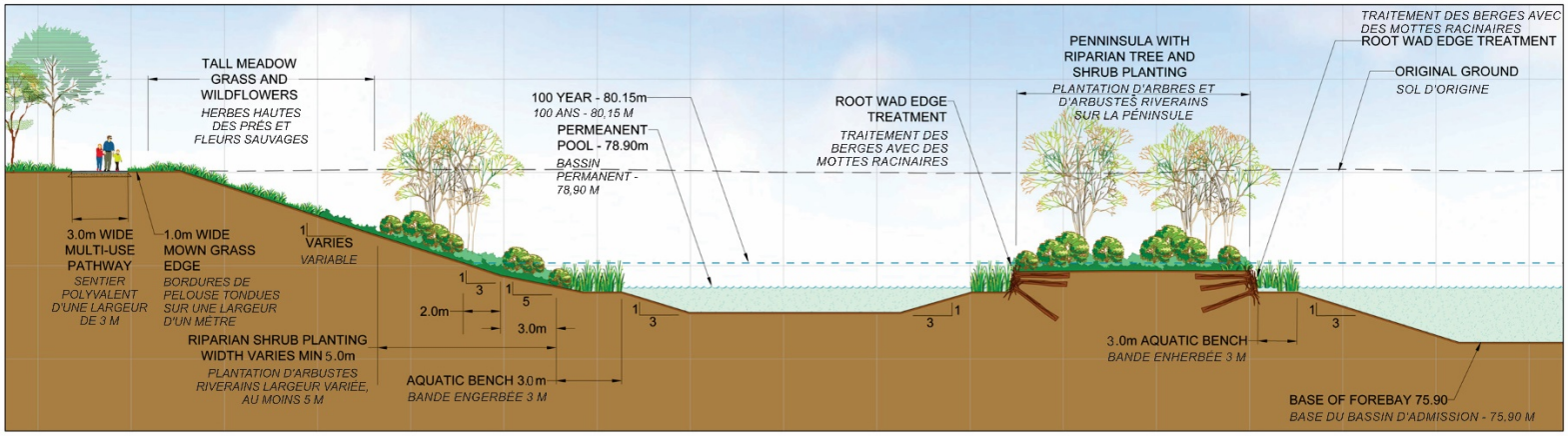



**Figure 8-2: Cross Section A-A' (Preferred Alternative)**

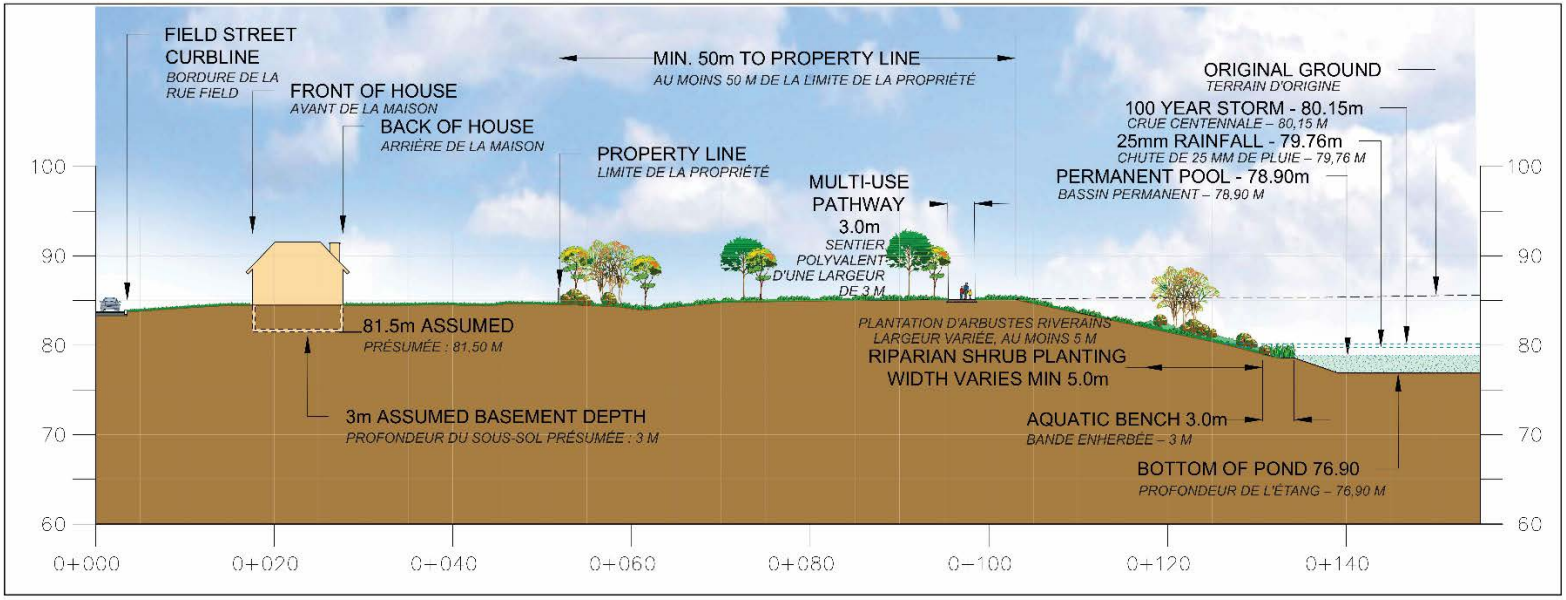



**Figure 8-3: Cross Section B-B' (Preferred Alternative)**

# 9. IMPACTS, MITIGATION MEASURES AND MONITORING

## 9.1 Assessment and Evaluation Approach

The preliminary impact analysis of alternatives went only so far as to be able to determine which alternative was preferred for the Study Area. If the resulting effects for a particular criterion were the same for each alternative, or if no residual effects were predicted, the results were not used to compare alternatives. These features, however, were still considered during the impact assessment for the preferred alternative. This section describes the comprehensive analysis/assessment of all the identified impacts associated with implementing the preferred alternative.

The values and conditions identified in the documentation of existing conditions were used as the basis for assessing the effects of the preferred alternative on the transportation, social, and natural environments. The impact analysis involved applying the following steps, as presented in Table 9-1.

**Table 9-1: Impact Assessment Approach**

| | Assessment Approach |
|---|---|
| Step 1 | Identify and analyze instances where the project, as discussed in Section 6, may interact with existing environmental conditions, as described in Section 4. |
| Step 2 | Acknowledge predetermined project activities that act as *built-in mitigation measures*. |
| Step 3 | Identify the *residual* environmental effects, if any. |
| Step 4 | Identify opportunities for further *mitigation of residual effects*, if possible/practical. |
| Step 5 | Determine the *significance of the residual* environmental effects, after further mitigation. |

## 9.2 Interactions

In order to understand the project interactions with the environment it is necessary to consider all phases of the project: pre-construction/design; construction; and operation. The following tables highlight the key activities associated with each phase and identify areas of potential interaction.

**Table 9-2: Project-Environment Interactions**

| Phase | Activity | Environmental Interaction |
|---|---|---|
| **Pre-Construction** | Field Investigations | Subsurface Conditions<br>Environmental Contamination Potential<br>Surface water<br>Fish and Aquatic Habitat<br>Species at Risk and Critical Habitat<br>Archaeological Potential |
| | Completion of detailed design and contract drawings | None anticipated |
| | Acquisition of land required for infrastructure | Land Use<br>Land Ownership<br>City Budgeting |
| **Construction** | Relocating hydro, telephone, and utilities | Surface Water<br>Fish and Aquatic Habitat<br>Wildlife and Habitat<br>Terrestrial Vegetation<br>Recreation and Multi-Use Pathways<br>Utilities and Infrastructure<br>Noise<br>Air Quality |
| | Clearing and grubbing trees and vegetation within the grading limits | Surface Water<br>Fish and Aquatic Habitat<br>Wildlife and Habitat<br>Terrestrial Vegetation<br>Species at Risk and Critical Habitat<br>Recreation and Multi-Use Pathways<br>Noise<br>Air Quality |

| Phase | Activity | Environmental Interaction |
|---|---|---|
| | Excavation of new SWMP and trenching for associated infrastructure | Subsurface Conditions<br>Environmental Contamination Potential<br>Surface Water<br>Fish and Aquatic Habitat<br>Archaeological Potential and Resources<br>Recreation and Multi-Use Pathways<br>Noise<br>Air Quality |
| | Connection of the new SWMP to Pinecrest Creek | Surface Water<br>Fish and Aquatic Habitat |
| | Installing remaining landscape features such as sodding or hydra-seeding, tree and shrub plantings | Aquatic Habitat<br>Terrestrial Vegetation<br>Recreation and Multi-Use Pathways |
| **Operation** | Operation of the new SWMP, including landscaped areas surrounding the pond. | Surface Water<br>Fluvial Geomorphology<br>Fish and Aquatic Habitat<br>Wildlife and Habitat<br>Terrestrial Vegetation<br>Species at Risk and Critical Habitat<br>Existing Land Use<br>Recreation and Multi-Use Pathways |

## 9.3 Climate Change

The MOECC has developed Codes of Practice to provide guidance regarding the Consideration of Climate Change in EAs (MOECC 2016). The consideration should include:

- alternative methods to reduce a projects greenhouse gas emissions and negative effects on carbon sinks; and
- resiliency to future changes in climate to helps maintain the ecological integrity of the local environment

The Provincial Policy Statement (PPS 2014) also notes that “Infrastructure...shall be provided in a coordinated, efficient and cost-effective manner that considers impacts from climate change”.

Climate change is likely to affect stormwater infrastructure due to increased frequencies and intensities of extreme weather events (IPCC, 2007). There is significant uncertainty however in the quantification of potential changes to the local climate change scale in

southern Ontario due to limitations of current climate modelling and projection tools (TRCA, 2009). Long term infrastructure design changes are being proposed at many levels to incorporate climate change mitigation and adaptation into stormwater pond design. These changes will take time to develop and approve. In the interim, the following general considerations are made:

- The Ottawa River Action Plan (ORAP) recommended this SWMP as one of several measures. The overall Plan includes both source control (lot, neighbourhood) and conventional stormwater management.
- Maintenance of Existing Stormwater Management Infrastructure: Additional maintenance of existing infrastructure may be necessary should the rainfall regime over the service life of the structure become more severe than that for which the structure was designed. For both quantity and quality control type storage structures, modest increases in rainfall severity (e.g. 15%) may force more frequent maintenance. Ongoing City monitoring programs will make the determinations regarding the frequency of maintenance requirements
- Increased erosion and loss of habitat along water courses can also be an impact of increased frequency and intensity of extreme weather events. Pinecrest Creek, which is the receiving body for the SWMP, will benefit from a restoration which will serve to reduce existing erosion potential and the SWMP will assist in reducing the flashiness of stormwater flows which enter the Creek.
- The SWMP will be naturalized with an increase in the diversity and quantity of plantings in the area. This will serve to:
    - support biodiversity
    - increased carbon sequestration and decreased greenhouse gas emissions
    - reduced maintenance compared to the cost of maintaining sod
    - appropriate plants that respond to a site's range of environmental gradients and hydraulic conditions

## 9.4 Built-in Mitigation Measures

In this assessment, "built-in mitigation" is defined as actions and design features incorporated in the pre-construction, construction and operational phases, which have the specific objective of lessening the significance of severity of environmental effects which may be caused by the project. They include standard construction practices and Best Management Practices (BMPs).

The SWMP will be designed and implemented with the benefit of contemporary planning, engineering, and environmental management practices. Regard shall be had for the legislation, policies, regulations, guidelines, and best practices of the day. Where possible, mitigation measures will be prescribed in construction contracts and specifications. Examples of practices that should be employed, based on current standards, are described below. These measures can be "built-into" the preferred design as described in Section 6. These mitigation measures will be updated and refined during the pre-construction, construction and operation phases of the project.

### 9.4.1 Emergency Response Plan

The preparation of an *Emergency Response Plan* to be used by the contractor will be included to allow full access to/of emergency services during the construction

period so that at any given time there is a method to access the site and all adjacent land uses.

The plan should include provisions for providing temporary services to end users in the event of a construction related service outage or other service disruption.

### 9.4.2 Environmental Protection Plan

It will be the responsibility of the contractor to ensure that no contamination, waste, or other substances, which may be detrimental to aquatic life or water quality, will enter a watercourse as either a direct or indirect result of construction. In this regard, any floating debris resulting from construction which accumulates on watercourse beds and watercourse banks is to be immediately cleaned up and disposed of. Any spills or contamination, waste or other substances which may be detrimental to aquatic life or water quality will also be immediately cleaned up.

Any construction works which will cause or be the cause of discharge to the watercourse are to be prohibited unless appropriate approvals are granted by governing authorities.

At all times, construction activities are to be controlled in a manner that will prevent entry of deleterious materials to watercourses. In particular, construction material, excess material, construction debris and empty containers are to be stored away from watercourses and the banks of watercourses.

### 9.4.3 Erosion and Sediment Control Plan

The purpose of the *Erosion and Sediment Control Plan* is to determine the degree of erosion and sedimentation that would occur under normally anticipated weather conditions during the life of the project, and to develop and implement mitigation strategies to control any unforeseen areas determined to have a pre-disposition to the problem.

During construction, the Contractor shall inspect and record the status and effectiveness of the erosion and sediment control measures regularly. The Contractor will make all necessary repairs if any damage occurs. The Contractor will ensure that effective erosion and sediment control measures are maintained until revegetation of disturbed areas is achieved.

Erosion and sediment control measures are to remain in place until the site of the project is re-stabilized following construction.

This plan includes the identification of planting and slope rounding specifications within the contract tender; identifying and specifying seeding and sodding locations; identifying areas requiring slope benching or retaining structures in the detailed design process; and construction and post-construction monitoring and mitigation practices.

### 9.4.4 In-Water Works BMPs

The proponent and contractor will work collaboratively with DFO to determine if the requirements for a Fisheries Compensation Plan, approval and/or letter of advice are needed for the modifications within the high-water-mark (HWM) of Pinecrest Creek. Any in-water works will require consultation with all regulatory agencies (RVCA, NCC etc.).

Any works within the watercourse will respect identified timing-windows and work restrictions outlined by governing authorities.

Ensure at all times the free flow of water and a water supply sufficient to maintain fish habitat functions downstream of the work area. Take the necessary measures to avoid impacts upstream and downstream of the work area.

### 9.4.5 Management of Contaminated Materials

The MOE, NCC and Construction Manager are to be notified immediately upon discovery of any contaminated material encountered within the construction area. If contaminated materials or contaminated groundwater are encountered within the construction limits, these are to be removed and disposed of in accordance with all applicable Acts and Regulations. Treatment and discharge of contaminated groundwater is also to be in accordance with applicable legislation and regulations.

### 9.4.6 Noise, Air Quality and Vibration

Varied construction activities within the Study Area are expected to create isolated and short term noise, air quality and vibration impacts on the environment. The construction manager will be required to develop a strategy for mitigating the effects according to good practices intended to satisfy, as feasible, the fugitive dust limits specified in O.Reg. 419, the noise limits specified in MOE NPC-115 and NPC-118 and the City of Ottawa By-laws for Noise. If applicable the plan will include good practices intended to satisfy, as feasible MOE NPC-119 and NPC-207 for ground vibrations. A list of common mitigation strategies adapted to the current project includes, but is not limited to the following:

Air emissions BMPs:

- Monitor wind conditions and plan operations to take advantage of calm wind periods;
- Minimize site storage of granular material in height and extent;
- Locate storage piles in sheltered areas that can be covered;
- Provide movable wind breaks;
- Use water spray and suppression techniques to control fugitive dust; and
- Cover haul trucks and keep access route to the construction site clean of debris.

Noise and vibration BMPs:

- Limit speeds of heavy vehicles within and approaching the site;
- Provide compacted smooth surfaces, avoiding abrupt steps and ditches;
- Install movable noise barriers or temporary enclosures if required;

- Keep equipment properly maintained and functioning as intended by the manufacturer; and
- If required, implement a blast design program prepared by a blast design engineer.

### 9.4.7 Public Communications Plan

The purpose of the *Public Communications Plan* is to keep the public informed about the work in progress and the end results of the construction activities. Residents and stakeholders must be kept aware of any scheduled service or pathway interruptions ahead of time so that their activities can be planned with minimum disruption. The plans should detail how to communicate the information to the public, what information should be disseminated, and in which project stages the communications should take place.

### 9.4.8 Species at Risk Update

The SARA is updated annually. SARA should be reviewed and an update of the potential species present and their associated habitat should be completed prior to construction.

Protection afforded to any species shall be in accordance with appropriate federal/provincial jurisdiction.

If a SAR is observed during construction, in the construction zone, the MNRF, NCC and Environment Canada are to be contracted immediately and operations modified to avoid any negative impacts to the species or their habitat until further direction is provided by the governing authority.

If necessary, permits will be obtained under SARA.

### 9.4.9 Spills Response and Action Plan

A *Spills Response and Action Plan* will highlight spills response and reporting procedures. Spills or discharges of pollutants or contaminants will be reported immediately to the land owner (NCC) and any regulatory authorities (i.e., RVCA, MNRF, MOECC, DFO, etc.).

Clean up of any spills shall be initiated quickly to ensure the protection of the environment to the extent possible. An adequate supply of clean-up materials is to be kept on-site with a work crew that is fully trained to prevent and respond to accidental spills.

Proper spill control equipment/items (spill kits, MSDSs, absorbents, containers, caution signs/tape, etc.) will be readily available in areas where large quantities of hazardous materials may be stored.

Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.

### 9.4.10 Traffic Management, Access and Pedestrian Control Plan

A *Traffic Management, Access and Pedestrian Control Plan* will be developed to manage transportation functions for all travel modes including equipment and material deliverables at various times during the construction period.

The intent of this plan is to ensure continued use of the NCC Experimental Farm Multi-Use Pathway system during construction. This plan is to be developed during the detailed design/pre-construction phase and implemented in the construction phase. Any pedestrian/cycling detours, traffic detours and/or lane reductions associated with the project will be identified. The Contractor will be required to develop the *Traffic Management, Access and Pedestrian Control Plan* for all detours, which will be monitored by the City.

### 9.4.11 Unexpected Discovery of Archaeological Resources

In the event that previously undocumented archaeological resources and/or human remains are uncovered, the proponent or the person discovering the archaeological recourses must cease alteration to the site immediately and engage a licensed consultant archaeologist to carry out field work, in compliance with Section 48 (1) of the Ontario Heritage Act.

Should deeply buried deposits be found on this property during any construction activities, the Ontario Ministry of Tourism, Culture and Sport shall be notified immediately (416-314-7178).

In the event that human remains are encountered during construction activities, local law enforcement authorities and/or the coroner will be notified immediately, followed by the Ministry of Tourism, Culture and Sport, and the Registrar of Cemeteries at the Ministry of Consumer Services (416-326-8393).

The NCC, as federal land owner, shall be notified immediately upon any discoveries.

### 9.4.12 Waste Management Plan

During construction there will be some excess materials that must be disposed of away from the project site. These may include concrete rubble, asphalt, waste steel/metal structural components, earth, and pathway appurtenances such as signs.

During detailed design, a Waste Management Plan will be developed to ensure that surplus material is recycled wherever practical and to describe the methods to be used by the contractor for disposal of all other surplus material in accordance with federal, provincial or local municipal practices and guidelines.

## 9.5 Site Specific Mitigation Measures

### 9.5.1 Landscape and Site Restoration Plan

The Landscape and Site Restoration Plan will be sensitive to physical and cultural heritage resources and adjacent land use. Where appropriate, existing landforms and vegetation will be preserved and incorporated into the Plan. Native plant material will be used where appropriate. Plant material or **f**encing to direct pedestrians to the crossing in winter to be provided in detailed design.

Native plant species which may be incorporated into the Landscape Design may include but not limited to:

**Trees (Deciduous and Coniferous)**

- Black Locust
- Common Hackberry
- Sugar Maple
- Silver Maple
- Red Maple
- Eastern Cottonwood
- Balsam Poplar
- Bur Oak
- White Cedar
- Common Larch
- White Spruce
- Balsam Fir

**Medium Trees**

- Serviceberry
- Pagoda Dogwood
- Flowering Dogwood (south-facing slopes only)
- Hawthorn
- Laurel Willow
- Ironwood
- Staghorn Sumac

**Shrubs**

- Common witch-hazel
- Arctic Willow
- Gray Dogwood
- Red-Osier Dogwood
- Grow-low Sumac
- Forsythia
- Meadow Rose (pond side slopes)
- Carolina Rose

**Perennials**

- Coneflower
- Blackeyed Susan
- Milkweed
- Tickseed
- Smooth Penstemon
- Stiff Goldenrod
- Cardinal Flower
- Meadowsweet
- Switchgrass
- Big Bluestem
- Waterlily
- Sneezeweed

### 9.5.2 Bird Hazard Risk Management

Table 9-3 summarizes the design recommendations to mitigate the potential for increased risk of birds being attracted to the area and how the pond option has been modified to incorporate these requirements.

**Table 9-3: Design Features to Mitigate Bird Hazard Risks**

| Preferred Pond Design Features (Beacon Environmental) | Rationale for Design Feature | Initial preferred pond concept ("Option 1") | Revised preferred pond concept and detailed design direction ("Modified Option 2") |
|---|---|---|---|
| Narrow and linear pond; length to width ratio of 3:1 or greater | Geese prefer open water areas that provide sufficient physical distance from potential predators (circular or square in shape) | Meets criteria | Meets criteria |
| Permanent water surface area less than 2ha | Permanent water surface area of less than 2ha will generally support fewer birds | Permanent water surface area 2.7ha | Permanent water surface area to be reduced to less than 2.7 hectares (while still meeting other SWM objectives); area to be confirmed during detailed design |
| Permanent pool depth of 2m or greater | To avoid creating feeding habitat | Forebay: 3m depth<br>Cells 1 and 2: 1.5m depth | Cells 1 and 2 to be increased to 2m depth |
| Minimum 5m width of dense shrub planting around pond edge | To prevent geese from walking into pond; to prevent nesting opportunities along shoreline; to skew site lines of geese if they are within pond (making them feel less safe) | Mix of riparian plantings, tall grasses and rushes around pond edge | Continuous minimum 5m-wide band of riparian shrub planting to be provided |
| Permanent depth of 1m or greater at water's edge | To limit growth of emergent and submergent vegetation attractive to geese | 3.5m wide flat bench around perimeter of pond with maximum permanent water depth of 0.3m | 3.0m wide flat bench with maximum permanent water depth of 0.3m; mandatory to address public safety concerns; continuous 5m band of dense riparian shrub planting to mitigate lack of 1m water depth at pond edge |
| Minimize use of in-water berms; where required, use high steep banks with dense shrub planting on the berm | In-water berms are attractive to geese as nesting sites | Wide peninsula with mix of riparian planting and tall grasses and rushes | Peninsula narrowed to 6-15m; "root wad" edge treatment added to create steep banks; dense riparian tree and shrub plantings on peninsula |

| Preferred Pond Design Features (Beacon Environmental) | Rationale for Design Feature | Initial preferred pond concept ("Option 1") | Revised preferred pond concept and detailed design direction ("Modified Option 2") |
|---|---|---|---|
| No manicured areas on site (save for 1.5m mow strips along pathways) | Manicured area highly attractive to geese and gulls for feeding and "loafing" | Meets preferred criteria: all areas except mow strips will be reforested, meadow (tall grasses, wildflowers) or replanted with dense shrubs | Meets preferred criteria: all areas except mow strips will be reforested, meadow (tall grasses/wildflowers) or replanted with dense shrubs |

## 9.6 Monitoring

Monitoring is important to verify the accuracy of effects predictions. Monitoring measures have been recommended to determine what effects actually occurred with project implementation, and may result in the modification of mitigation measures to improve their effectiveness.

## 9.7 Assessment and Evaluation Results

As described in the methodology, an environmental effect requires consideration of the interaction of the project (i.e., project activities) with the environment. Pre-construction, construction, and operational activities were assessed.

Professional judgement and experience formed the basis for identifying environmental effects and mitigation measures. The analysis was based primarily on comparing the existing environment with the anticipated future environment, during and after construction. Consideration was given to:

- The magnitude, spatial extent, and duration of effects;
- The proportion of a species population of the number of people affected;
- Direct or indirect effects;
- The degree to which the effect responds to mitigation; and
- The level of uncertainty about the possible effect.

In this assessment, "residual" environmental effects are defined as changes to the environment caused by the project, and vice versa, when compared to existing conditions and taking into account all mitigation measures. Potential residual environmental effects are assessed as to their significance, including spatial and temporal considerations, and are categorized according to the following definitions:

***"Negligible"*** means an effect that may exhibit one or more of the following characteristics:

- Nearly-zero or hardly discernible effect; or
- Affecting a population or a specific group of individuals at a localized area and/or over a short period of time.

***"Insignificant"*** means an effect that may exhibit one or more of the following characteristics:

- Not widespread;
- Temporary or short-term duration (i.e. only during the construction phase);
- Recurring effect lasting for short periods of time during or after project implementation;
- Affecting a specific group of individuals in a population or community at a localized area or over a short period; or
- Not permanent, so that after the stimulus (i.e. project activity) is removed, the integrity of the environmental component would be resumed.

***"Significant"*** means an effect that may exhibit one or more of the following characteristics:

- Widespread;
- Permanent transcendence or contravention of legislation, standards, or environmental guidelines or objectives;
- Permanent reduction in species diversity or population of a species;
- Permanent alteration to groundwater flow direction or available groundwater quantity and quality;
- Permanent loss of critical/productive habitat;
- Permanent loss of important community archaeological/heritage resources; or
- Permanent alteration to community characteristics or services, established land use patterns, which is severe and undesirable to the community as a whole.

The above definitions of significance were adopted for use in this assessment because many of the impacts cannot be quantified in absolute terms, although changes and trends can be predicted. The definitions provide guidance and are intended to minimize personal bias.

Study boundaries serve to focus the scope of the assessment such that a meaningful analysis of potential impacts arising from the proposed project can be made. Project boundaries are defined by the spatial and temporal limits of the proposed project activities, and their zones of influence.

**Spatial:** The physical area which may be disturbed (directly or indirectly) by construction activities on the property and directly adjacent lands. Consideration was given to the areas downstream of the works that may be impacted before, during and/or after construction.

**Temporal:** The duration of the active construction phase of the project, scheduled to occur over a number of months and is not anticipated to take longer than two years. The completed project is considered to be permanent infrastructure, which will operate as constructed for the life span of the facility as determined by transportation needs in the City.

Table 9-4 describes the potential effects, mitigation, residual effects and their significance, and monitoring recommendations for the preferred alternative.

**Project phases are identified as follows:**

**P** – Pre-construction/design; **C** – Construction; **O** - Operation

Once potential effects were predicted, mitigation measures were identified. Often these mitigation measures were sufficient to reduce potential negative effects to an insignificant or negligible status. Mitigation includes environmental rehabilitation and replacement. Proposed mitigation measures are summarized in Table 9-4.

**Table 9-4: Assessment of Environmental Effects**

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| **Subsurface/Surface Conditions** | Pond floor/bottom materials are sensitive to disturbance by construction traffic and ponded water. | Additional investigation and geotechnical design input will be required at the detailed design stage to determine site-appropriate construction techniques, particularly with regards to the limited load bearing capacity of the silty clay on site. The additional investigation should include hydrogeologic testing of the bedrock and further delineation of its surface profile.<br>If the pond floor needs to be trafficable, the bottom of the pond should be lined with a material such as rip-rap, a synthetic geocell erosion layer, or interlocking concrete blocks to minimize disturbance to the subgrade etc.<br>A geotextile may also be required in addition to the materials mentioned above.<br>At the detailed design stage, the stability of the proposed pond slopes should be evaluated for seismic or rapid draw down conditions. | None anticipated | Negligible | None |
| | Stockpiling materials has the potential to impact settlement-sensitive buried services.<br>Increased potential of sedimentation/stock-piled material to enter the watercourse and fugitive dust emissions. | Additional investigation and geotechnical design input will be required at the detailed design stage to determine site-appropriate construction techniques, particularly with regards to the limited load bearing capacity of the silty clay on site.<br>If settlement-sensitive buried services or other structures are present or proposed in the area of stockpiled material, the height of the stockpile may be limited in order to control the amount of settlement of the silty clay. A limit of about 2.8 m above existing ground surface where settlement is a concern has been identified.<br>Erosion and Sediment Control Plan<br>Environmental Protection Plan<br>Construction Waste Management Plan<br>Management of Contaminated Materials Plan<br>Air Quality BMPs | Reduced likelihood of material entering the watercourse or of contaminated materials stockpiling. | Insignificant | None |

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| | Potential for ground settlement due to groundwater lowering associated with groundwater removals during construction/excavations. | Additional investigation and geotechnical design input will be required at the detailed design stage to determine site-appropriate construction techniques, particularly with regards to the limited load bearing capacity of the silty clay on site.<br>Edge of the pond should be located at least 50 m away from the nearest structures to minimize the impacts of the groundwater level lowering on the performance of these structures. 15 m margin is definite; and 15-50 m may be required.<br>A Permit-to-Take-Water (PTTW) is required from the MOECC for rates of groundwater inflow in excess of 50,000 L/day.<br>Removal of groundwater by well filtered sumps in the excavations. | Potential for localized settlement on-site. | Insignificant | None |
| **Environmental Contamination Potential** | Potential to encounter contaminated sites during ground disturbance procedures such as excavations and trenching. | A Phase II Environmental Site Assessment (i.e. soil and groundwater sampling) has been recommended to address potential environmental concern related to significant staining on the gravel surface within the hydro transformer sub-station located immediately to the north of the western part of the site (Trow, 2006).<br>Mitigation in accordance with results of Phase II ESA<br>Management of Contaminated Materials Plan | Potential for disruption of un-identified localized contaminated soils. | Negligible | None |
| | A spill or leak from equipment on-site during construction could result in the contamination of soils, surface or groundwater, or pose a health and safety hazard. | To avoid the release of any deleterious substances during the construction phase, the Project Manager must ensure that:<br>• The operations of refueling and maintenance with the use of toxic materials is performed off-site;<br>• Stabilize any waste materials removed from the worksite, upland to prevent them from entering the watercourse (Pinecrest Creek).<br>Spills Response and Action Plan<br>Environmental Protection Plan | Potential for localized soil contamination resulting from an unexpected leak/spill. | Insignificant | None |
| **Surface Water** | Current source water protection policies and requirements may be applicable to the new SWMP. | City's Source Water Protection Risk Management Staff have confirmed the pond does not pose a risk in accordance with the guidelines. | None anticipated | None anticipated | None |

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| | Increased contamination potential in Pinecrest Creek to unforeseen fuel spills resulting from the use and storage of construction machinery near a watercourse. | Storage of equipment will not occur within 30 m of the watercourse.<br>Design temporary infrastructure to accommodate expected and unexpended high flows of water during the construction period.<br>Avoid soil disturbance during unusually wet, rainy or winter thaw conditions.<br>Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks and encourage the use of vegetable based oils.<br>Protect entrances at machinery access points and establish singe site entry and exit.<br>Installation, use, and proper maintenance of erosion and sedimentation control measures.<br>Shores, beds of waterbodies, and floodplains should be protected to minimize the impact on water flow and to prevent degradation and erosion.<br>Store all oils, lubricants, fuels and chemicals in secure areas, on impermeable pads and away from aquatic habitats and waterbodies. | Temporary localized potential for contamination from unexpected leaks or spills | Insignificant | None |
| | Increased sedimentation potential in Pinecrest Creek while ground surfaces are exposed and disturbed. Ground surface exposure may result from clearing and grubbing and excavation activities. | Erosion and Sediment Control Plan<br>Environmental Protection Plan<br>Landscape and Site Restoration Plan | Temporary and localized potential for unexpected sedimentation in the watercourse | Insignificant | In accordance with Erosion and Sedimentation Monitoring Plan |
| | Potential for short-term influx of sedimentation when the new SWMP is connected to Pinecrest Creek. | Clean stone/rock will be used during construction of outlets to minimize sediment release during connection. | Potential for short-term localized influx of sedimentation upon connection. | Insignificant | None |
| | Removal of gabion baskets and slope restoration to more natural conditions may release sedimentation and other materials into the watercourse during construction. | Works will be completed such that they do not restrict the normal flow of the creek.<br>Materials will be placed along the embankment. Minimize the extent (vertical and horizontal) of materials through careful placement of materials and observe placement, and not dumping/slinging.<br>Erosion and Sediment Control Plan<br>Environmental Protection Plan<br>Landscape and Site Restoration Plan | Temporary and localized potential for unexpected sedimentation and debris (gabion materials) to enter the watercourse. | Insignificant | None |

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| | Improvements to stormwater discharge characteristics/ quality and slope stability associated with operation of the SWMP. | None required | Positive residual effect on the Pinecrest Creek sub-watershed and for the Westboro Beach on the Ottawa River. | Positive | Watershed monitoring in accordance with P/W SWMRetrofit Plan |
| **Fluvial Geomorphology** | Reduced erosion potential in Pinecrest Creek due to operation of the new SWMP. | None required | Positive residual effect on Pinecrest Creek. | Positive | Watershed monitoring in accordance with P/W SWM Retrofit Plan |
| **Fish and Aquatic Habitat** | Increased potential for sedimentation to enter aquatic habitat while ground surface is disturbed during construction. | Erosion and Sedimentation Plan<br>In-Water Works BMPs<br>Complete as much work as possible off-line before connecting the SWMP to Pinecrest Creek.<br>Design temporary infrastructure to accommodate expected and unexpended high flows of water during the construction period.<br>Avoid soil disturbance during unusually wet, rainy or winter thaw conditions.<br>Shores, beds of waterbodies, and floodplains should be protected to minimize the impact on water flow and to prevent degradation and erosion. | No residual harm to fish or aquatic habitat is anticipated with the implementation of effective mitigation measures and best management practices. | Insignificant | In accordance with Erosion and Sedimentation Monitoring Plan |
| | Increased contamination potential to fish and aquatic habitat due to unforeseen fuel spills as a result of construction machinery on-site and in proximity to Pinecrest Creek. | Storage of equipment will not occur within 30 m of the watercourse.<br>Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks and encourage the use of vegetable based oils.<br>Protect entrances at machinery access points and establish singe site entry and exit.<br>Store all oils, lubricants, fuels and chemicals in secure areas, on impermeable pads and away from aquatic habitats and waterbodies.<br>Environmental Protection Plan<br>Spills Response and Action Plan | No residual harm to fish or aquatic habitat are anticipated with the implementation of effective mitigation measure and best management practices. | Insignificant | None |

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| | Construction of the riffle-pool sequence will occur “in the dry” within Pinecrest Creek. Works in the watercourse have the potential to negatively affect aquatic habitat and fish on-site and downstream. | Any works within the high-water mark (HWM) will require consultation with regulatory agencies (RVCA, NCC, DFO etc.).<br>The materials to be used for the construction of the pool/riffle sequence must be clean.<br>Ensure the banks and any temporary structures are stabilized.<br>The working end of machinery will be clean and maintained free of fluid leaks. If oils are to be used, they will be vegetable based oils.<br>Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks and encourage the use of vegetable based oils.<br>Installation, use, and proper maintenance of erosion and sediment control measures including turbidity curtains, cofferdams, etc. should be employed.<br>Cofferdams should be sufficiently high to prevent overtopping in the event of sudden increases in water levels.<br>Cofferdams are to be constructed using clean, approved materials and are to be removed as soon as possible following construction within the watercourse.<br>Cofferdams should be removed from the watercourse when no longer required, and when in-stream works areas have been fully stabilized.<br>Silt or debris that accumulates around a temporary cofferdam must be removed prior to withdrawal of the cofferdam.<br>To prevent silt and sedimentation from entering the watercourse, a pump shall be used to remove the silted water from the work area inside the cofferdams. This silted water shall be treated by discharging into settling basins, vegetated areas or sediment traps prior to release back into the watercourse.<br>In-Water Works BMPs | Potential for short-term localized disruptions to fish and aquatic habitat. | Insignificant | None |
| | Potential for downstream and on-site sedimentation during restoration works which may temporarily degrade fish habitat. | Ecological Site Assessment<br>Environmental Protection Plan<br>Erosion and Sediment Control Plan<br>In-Water Works BMPs<br>Landscape and Site Restoration Plan<br>The potential of the site to host or provide habitat for a variety of species at risk is to be determined prior to construction. | No residual harm to fish or aquatic habitat are anticipated with the implementation of effective mitigation measure and best management practices. | Insignificant | In accordance with Erosion and Sediment Control Plan |

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| | Improved water quality for fish and aquatic habitat during operation of the SWMP. | None required | Positive residual effect on fish and aquatic habitat downstream of the new SWMP | Positive | None |
| **Terrestrial Vegetation** | Loss of vegetation to accommodate new SWMP (such as clearing and grubbing). | Minimize vegetation removals to the extent possible.<br>Consultation with the NCC for tree replacement policies and requirements.<br>Landscape and Site Restoration Plan<br>Tree Compensation Plan | Minor localized vegetation loss to accommodate SWMP footprint. | Insignificant | None |
| | Restoration of vegetation on-site following construction including landscaped features. | Minimize vegetation removals to the extent possible.<br>Where appropriate, restore the area with fast-growing, low maintenance, diverse native species adapted to the project area to enhance the local plant community.<br>Erosion and Sediment Control Plan<br>Landscape and Site Restoration Plan<br>Tree Compensation Plan | None anticipated | Insignificant | None |
| **Wildlife and Habitat** | Clearing and grubbing may result in temporary, localized avoidance of the Study Area by urban wildlife due to noise and potential destruction of habitat. | An Ecological Site Assessment should be carried out to more thoroughly determine the presence of habitat and species requirements.<br>If removal of the existing vegetation is to occur during the breeding bird season (May 1st to August 15th), investigate the area for any nests or dens prior to demolition/removals.<br>If active migratory bird nests are discovered, removals should be further postponed to give young birds time to fledge.<br>All waste and litter must be collected and removed from the work site on a daily basis, or stored in secure containers to prevent scavenging by birds and wildlife. | Localized and temporary disturbance and loss of habitat. | Insignificant | None |
| | Loss of localized field habitat due to construction of the new SWMP. | Minimize vegetation removals to the extent possible.<br>Where appropriate, restore the area with fast-growing, low maintenance, diverse native species adapted to the project area to enhance the local plant community.<br>Landscape and Site Restoration Plan<br>Tree Compensation Plan | Permanent loss of field habitat to accommodate new SWMP | Insignificant | None |

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| | Bird Attraction | Minimize suitability/attractiveness of pond to birds to avoid interference with airplane flight paths:<br>• Strategy to be developed in consultation with Ottawa MacDonald-Cartier International Airport Authority and confirmed with Transport Canada | | Insignificant | Monitor effectiveness of preventative measures |
| **Species at Risk and Critical Habitat** | Potential disruption of Species at Risk (snakes, turtles, birds) due to general construction activities. | An Ecological Site Assessment should be carried out to more thoroughly determine the presence of natural heritage features, and SAR and their habitat located on the site.<br>SAR BMPs | Temporary localized disruption of potential SAR habitat. | Insignificant | If required under OESA and SARA permitting. |
| | Butternut trees on-site may be impacted by general construction and construction related activities. | Butternut Health Assessments will be required for those specimen Butternuts which occur within 25 m of proposed pond.<br>If the trees are deemed healthy and retainable, exclusionary fencing/drip line protection around the identified trees will ensure construction activities do not impact the trees.<br>If required, a detailed mitigation plan in consultation with the NCC and Environment Canada. | Protection of the existing butternut trees (dependent on health assessment) | Insignificant | None |
| **Cultural Heritage Resources** | Unknown archaeological potential on-site may be affected by ground disturbance during construction. | Stage 2 Archaeological Assessments are required prior to soil disturbance on the site.<br>Consult with the Aboriginal Groups regarding the scope and results of Archaeological Assessments. | Potential disturbance of archaeological resources during construction. | Insignificant | As per Archaeological Assessments |
| **Existing Land Uses and Ownership** | School playfield use of the property may be affected during construction. | Where possible schedule construction activities that may disrupt use of the playfield to occur when school is not in session.<br>Communications with the school board regarding any use of the leased lands.<br>Traffic Management, Access and Pedestrian Control Plan | None anticipated | Negligible | None |
| | NCC lands are required for the construction and operation of the SWMP. | Negotiations and Agreements to be made between the City of Ottawa and the NCC. | None anticipated | Negligible | None |
| **Recreation and Multi-Use Pathways** | Detours and general work activities during construction will be an inconvenience to Experimental Farm Pathway users. | Construction phasing to minimize effects on traffic and pathway users.<br>Noise, Vibration and Air Quality BMPs<br>Public Communications Plan<br>Traffic Management, Access and Pedestrian Control Plan | Temporary localized disruption to the Experimental Farm Pathway network. | Insignificant | None |

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| **Recreation and Multi-Use Pathways** | Landscaping will provide additional features not currently associated with the site. | Implement measures to control and direct the safe and secure movement of pathway users in and around the new SWMP infrastructure.<br>Landscape and Site Restoration Plan | Potential for enhanced pathway user experience. | Positive | None |
| **Noise and Vibration** | Potential disruption or disturbance of adjacent land uses during construction. | Contractor to ensure that City By-laws (2004-253) are not contravened, equipment is well tuned, the lubrication of moving parts, and unnecessary idling will be restricted.<br>Noise and Vibration BMPs | Noise may be a temporary, localized irritant to adjacent land owners and pathway users. | Insignificant | None |
| **Air Quality** | Potential isolated and minor increases in dust and equipment exhausts. | Air Quality BMPs | Dust may be a temporary, localized irritant to adjacent land owners and pathway users. | Insignificant | None |
| **Road Network** | Potential delays to traffic due to heavy equipment entering and leaving the site during construction. | Construction timing/deliveries to minimize effects to traffic.<br>Traffic Management, Access and Pedestrian Control Plan | Potential for short and sporadic traffic delays during construction. | Insignificant | None |
| **Transit Network** | Potential transit delays due to heavy equipment entering and leaving the site during construction. | Construction timing/deliveries to minimize effects to traffic.<br>Traffic Management, Access and Pedestrian Control Plan | Potential for short and sporadic delays to the transit network during construction. | Insignificant | None |
| **All utilities and infrastructure** | Potential to interrupt utilities and infrastructure during relocations/connections. | Confirm and update easement information (e.g., name, conditions, and structures in the easement) prior to construction.<br>Hydro One has general requirements for access to the corridor, and has requested the proposed concept plan be circulated for their review. They will provide more site specific comments during their review.<br>Coordinate the timing of infrastructure construction to increase efficiencies and ensure appropriate timing of services. | Construction coordination of infrastructure | Negligible | None |

| Factors/Sub-Factors | Environmental Effects (Positive or Negative & Opportunities) | Mitigation Measures *Built-in Mitigation Measures* | Potential Residual Effect | Significance After Mitigation | Monitoring Requirements |
|---|---|---|---|---|---|
| **Drainage and SWM Infrastructure** | Improvements to water quality and reduced erosion potential in Pinecrest Creek. | A structural evaluation of the condition of the gabion wall (which forms a wing wall along the west side of the outlet) is recommended if it is to be maintained as part of the pond design. | Long-term benefits to water quality and stability of Pinecrest Creek. | Positive | None |
| **Climate Change** | The nature of the design is such that extreme events will not result in higher risk of failure. | Design overflows to existing outlets | Overall improved control of peak flows | Positive | N/A |

# 9.8 Monitoring and Adaptive Management

## 9.8.1 Proposed Monitoring Program - Operational

Monitoring requirements for the P/W SWM Retrofit Study are outlined in Section 5 of the 2011 report (JFSA, 2011). The proposed monitoring is based on a Condition-Street-Response framework. It uses specific indicators to assess watershed health, watershed stressors and management response.

Table 9-5 highlights the proposed facility and sewershed monitoring program as outlined in the P/W SWM Retrofit Study (JFSA, 2011). The facility and sewershed monitoring in key locations can be carried out to assess the effectiveness of lot level, conveyance and EoP measures as they are implemented over time.

**Table 9-5: Proposed Facility and Sewershed Monitoring Program (JFSA, 2011)**

| Parameters | Monitoring Locations and Details | Recommended Frequency |
|---|---|---|
| Flow and Water Levels | **Pinecrest Creek flow and water level monitoring** – *Refer to Section 5.1.4: streamflow monitoring undertaken for the general monitoring program (JFSA, 2011).* | |
| | **Outfall monitoring** – monitoring EoP discharge | April to October (Continuous for all events) |
| | **Sewershed flow monitoring** – it is recommended that flow be monitored at an outflow point in the sewershed by installing continuous flow gauges within the sewer at a maintenance hole location | April to October (Continuous for all events) |
| Precipitation | **Precipitation monitoring** collected at a local gauge which may be one of the gauges installed for the general monitoring program | April to October (Continuous) |

| Parameters | Monitoring Locations and Details | Recommended Frequency |
|---|---|---|
| Water Quality Monitoring | **Outfall monitoring** – monitoring EoP discharge using automated sampler triggered by flow levels | April to October (5 to 7 Events) |
| TSS, Total phosphorus and *E.coli* | **Sewershed monitoring** – at same location(s) used for the sewershed flow monitoring with an automated sampler that can be triggered by flow levels | |
| Creek Corridor Stability Monitoring | Implementation of the SWMP will require monitoring from the connection node downstream to the SJAMP culvert (the limit of the open channel portion of Pinecrest Creek.[2] | The frequency of cross-section monitoring should be as follows: Prior to implementation, reaches, sections and velocity/sediment sampling should occur to establish the pre-construction conditions (baseline data); surveying and analysis should then occur a minimum of 2 times per year for a period of three years.2 |

The monitoring results should be used to confirm and/or adjust future actions. Implementation of the Retrofit Plan and the anticipated watershed response will occur over an extended period of time.

### 9.8.2 Proposed Monitoring – Bird Hazard

Monitoring (Appendix H): To confirm low use of the pond by gulls and geese, a two to three year monitoring program should be established. Baseline data for the project location is being collected in the 2017 breeding season and will also occur in the summer and fall prior to the pond being constructed. Following commissioning of the facility, monitoring will commence. The monitoring will need to establish bird numbers during the spring and fall migration period as well as summer breeding/feeding/loafing numbers, in comparison to the pre-pond condition.

[2] *Refer to Section 5.1.2: Erosion and Deposition Impacts and Channel Stability in Pinecrest Creek Corridor undertaken for the general monitoring program (JFSA, 2011)*

Contingencies: In the event that the hazard level and associated risk to aircraft associated with the pond reaches an unsatisfactory level (i.e., there is hazardous bird activity reported in the vicinity of the pond by a pilot/airport personnel or a bird strike or near miss occurs in proximity to the pond), a number of contingency measures can be considered for implementation including:

Design:

- Additional landscape hardening of pond shore in specific areas
- Specific alternate landscape planting to reduce use of specific areas by geese and gulls
- Over-wiring of the pond

Wildlife control:

- Egg oiling
- Capture-Release
- Harassment (effigies/dogs, etc.).

# 10. NEXT STEPS

## 10.1 Property Use Agreement

The Stage 2 OLRT Project Agreement Lands Schedule will describe the process for property acquisition. This project will be subject to National Capital Commission standard terms and conditions for licenses of occupation during construction.

## 10.2 Approvals

The approvals outlined below provide an overview of the agency approvals and permits that are likely to be required for the completion of this project. In all cases, it is the proponent's responsibility to identify all permitting requirements and to ensure that any additional requirements from other federal, provincial and municipal jurisdictions are followed.

### 10.2.1 Federal Land Use and Design Transaction Approval

All individual and federal organizations need NCC approval before undertaking projects on federal lands in Canada's Capital Region (*National Capital Act*). As such a Federal Land Use and Design Transaction Approval (FLUDTA) will be required. The NCC has participated in this study's consultation process and had representatives on the TAC.

#### 10.2.1.1 Federal Environmental Effects Evaluation

Under the CEAA 2012, a federal environmental assessment must be completed if the project is listed in the *Regulation Designating Physical Activities* or if there is a ministerial order. The B/W SWMP is not a project that is listed as a designated project nor has there been a ministerial order.

However, under Section 67 of the CEAA a federal authority must not exercise any power or perform any duty or function conferred on it that could permit a project to be carried out, in whole or in part, on federal lands, unless the authority determines that the carrying out of the project is not likely to cause significant adverse environmental effects.

The NCC will require an Environmental Effects Evaluation to ensure that the project will not cause significant adverse environmental effects before a Federal Land Use and Design Transaction Approval (FLUDA) will be issued.

### 10.2.2 Fisheries Act Approval

Under Section 35(1) of the *Fisheries Act* no person shall carry out work, an undertaking or an activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. Exceptions to this law include receiving authorization from the Minister, performing

the work in accordance with prescribed conditions authorized by a prescribed person or entity, or if the work is carried out in accordance with the regulations.

The deposit of deleterious substances is prohibited under the Regulations, where deleterious substances refers to any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water. This includes adding any water that contains substances in such quantity or concentration, or that has been treated, processed or changed, by heat or other means, from a natural state, that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.

A Self-Assessment will be required under the Fisheries Act. Following the self-assessment, the proponent will contact the DFO for authorization if:

- Construction of the new land-based SWMP will require works occurring below the HWM of a nearby waterbody;
- Construction of a new storm outfall results in a temporary or permanent increase in existing footprint below the HWM or where new temporary or permanent fill is placed below the HWM; and
- Bank stabilization using rock protection, plantings or bioengineering that results in temporary or permanent increases to the existing footprint below the HWM or if new temporary or permanent fill is placed below the HWM.
- Any restoration projects including riparian plantings, shoreline/bank stabilizations that will include the placement of temporary or permanent fill below the HWM.

It is recommended that the contractor/proponent seek advice from a qualified environmental professional following detailed design if there is any uncertainty about whether the project requires a review by DFO and to ensure compliance with the *Species at Risk Act* and the pollution prevention provisions of the *Fisheries Act*

### 10.2.3 Environmental Compliance Approval

An Environmental Compliance Approval per the *Ontario Water Resources Act* will be required. The MOECC has been consulted during this study and was represented on the TAC.

### 10.2.4 Species at Risk Act

The SARA provides automatic protection to species classified as endangered, threatened, or extirpated on federal lands. Butternut trees are endangered and protected under this Act, unless determined to be hybrid. Hybridity testing is recommended on all Butternut trees within the site.

### 10.2.5 Development, Interference with Wetlands, and Alternations to Shorelines and Watercourses Permit

Pinecrest Creek subwatershed and the Westboro area are within the jurisdiction of the Rideau Valley Conservation Authority. The RVCA has participated in this study's consultation process and has representatives on the project's TAC. As part of its mandate, the RVCA reviews development proposals within or adjacent to natural areas including wetlands, shorelines and waterways (*Ontario Regulation 174/06)*. The RVCA oversees permits for development and ensures that fish habitat is protected and not harmfully altered. NCC typically works with the RVCA review and comment as a matter of policy.

## 10.3 Notice of Completion

The Notice of Completion is issued to complete the screening requirements for this Schedule B project. The review period associated with the Notice of Completion is 30 calendar days, although the proponent may to choose to set a longer period under special circumstances such as the intervention of public holidays. The Notice of Completion clearly states the review period and the date by which all submissions or requests for an order are to be received. If no request is received within the review period specified in the Notice, the proponent may proceed to design and construction of the project.

# 11. SUMMARY AND CONCLUSIONS

The Pinecrest Creek/Westboro SWM Retrofit Study (2011) was completed to fulfill one of the seventeen ORAP project recommendations, and resulted in the recommendation of a SWMP at the northeast corner of Baseline Road and Woodroffe Avenue as a solution. The feasibility of this SWMP was confirmed in the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (2015).

The purpose of this EA was to investigate the SWMP alternatives and predict the potential impacts of the preferred alternative on the bio-physical, socio-economic, transportation, and infrastructure environments, as well as to recommend mitigation measures to deal with any impacts.

Construction of the pond will impose minimal general disturbances related to the pond floor material, stockpiling material and mass, sedimentation, unanticipated spills or leaks from equipment, species at risk and species habitat, detouring of recreational pathways, transit and traffic delays, and the potential uncovering of unknown archaeological potential. During the operational life of the pond, however, it will receive runoff and provide a level of control for storm events up to the 100-year storm, provide over 60% TSS removal, provide a reduction in erosion potential along Pinecrest Creek, will improve water quality, and will ultimately decrease the amount of in-channel sediment moving through the system and depositing at the Iris Street culvert (the first main culvert downstream of the proposed pond).

The environmental impacts will be mitigated through built-in mitigation measures and site specific mitigation measures. The mitigation measures recommended are considered sufficient to reduce potential negative effects to an insignificant or negligible status.

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# 13. APPENDICES

**FOR INFORMATION ON APPENDICES A, B, C, D and E PLEASE CONTACT**:

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# Appendix A: Technical Advisory Committee and NCC Consultation Material

***TAC Meeting #1 February 25, 2016***

- Agenda
- Meeting Minutes
- Milestones and Schedule
- Presentation – Cumulative Impacts Study and Municipal Class EA

***NCC Correspondence***

- Questions from Public re: NCC involvement and approvals, December 20, 2016

***NCC Meeting #1 December 7, 2015***

- Meeting Notes

***NCC Meeting #2 June 28, 2016***

- Agenda
- Meeting Minutes
- Presentation – Cumulative Impact Study and Municipal Class EA
- Responses to NCC Internal Design Review Committee
- Correspondence with NCC re: Potential sediment disposal site north of Iris

# AGENDA

MORRISON HERSHFIELD

**Project:** Pinecrest Creek Cumulative Impacts Study and Baseline/Woodroffe SWM Pond Municipal Class EA

**Place:** 180 Elgin, 6th floor (Trillium Boardroom)

**Date:** Thursday February 25, 2016

**Time:** 9am-12pm

**Participants:** NCC, MOE, RVCA, City of Ottawa

**Conference Call Details:**

→ Join Skype Meeting

**1-877-495-4202 (North America)** **English (United States)**
**1-613-212-5081 (North America)** **English (United States)**
**Conference ID: 3980127**
**PIN: 90210**

*Background:*

*The outcome of this study is required to inform the preliminary engineering of Stage 2 LRT through the Pinecrest Creek corridor, assist in securing NCC approvals for Stage 2, and to fulfill the Class EA requirements/ confirm the functional design for the proposed retrofit pond at the northeast corner of Baseline and Woodroffe. Work will also be completed to further identify/model the effects of projected retrofits (conveyance and lot level) over the next 20 years+/-.*

| ITEM | BY | DURATION |
|---|---|---|
| Welcome/Introductions/Background | Darlene Conway, City of Ottawa | 15 min |
| Project Overview | Karyn Cornfield, Morrison Hershfield | 15 min |

- Purpose of Study
- Project Team & Status (Work Completed to Date)
- Stakeholder/Agency Involvement

| | | |
|---|---|---|
| Baseline/Woodroffe Pond EA | Kelly Roberts, Morrison Hershfield | 15-30 min |

- Discussion of EA objectives, process, issues
- Confirmation of preferred pond option

| | | |
|---|---|---|
| Pinecrest Creek CIS | Heather Wilson, JF Sabourin & Associates<br>John Beebe, GeoProcess Research Associates | 15-30 min |

- Discussion of CIS purpose, process, steps and tasks
- Confirmation of footprints of future projects and development

| | | |
|---|---|---|
| Key Milestones | Karyn Cornfield, Morrison Hershfield | 10 min |

# MINUTES

MORRISON HERSHFIELD

**Pinecrest Creek Cumulative Impacts Study and Baseline/Woodroffe Retrofit Pond Class EA**
**Technical Advisory Committee (TAC) Meeting #1**

| | | |
|---|---|---|
| **Project:** | Pinecrest Creek Cumulative Impacts Study and Baseline/Woodroffe SWM Retrofit Pond Class EA | |
| **Place:** | 180 Elgin, Trillium Boardroom, Ste. 601 | |
| **Date:** | Thursday February 25, 2016 | |
| **Time:** | 9:00 - 11:15am | |
| **Present:** | Martin Barakengera (MB) | NCC |
| | Julie Mulligan (JM) | NCC |
| | David Malkin (DM) | NCC |
| | Bina Chakraburtty (BC) | NCC |
| | Juan Galindez (JG) | NCC |
| | Jocelyn Chandler (JC) | RVCA |
| | Charles Goulet (CG) | MOECC |
| | Ben Strang (BS) | City of Ottawa |
| | Eric Tousignant (ET) | City of Ottawa |
| | Eva Spal (ES) | City of Ottawa |
| | Carolyn Newcombe (for E. Murphy) | City of Ottawa |
| | Darlene Conway (DC) | City of Ottawa – City Coordinator |
| | Laurent Jolliet (LJ) | City of Ottawa |
| | Jabbar Siddique (JS) | City of Ottawa |
| | Heather Wilson (HW) – via telecom | JFSA – CIS Lead |
| | Colin Brennan (CB) | JFSA – CIS |
| | Charles Wheeler (CW) | CTP2 - Stage 2 LRT |
| | Elie Dagher (ED) | CTP2 - Stage 2 LRT |
| | Marc Magierowicz (MM) | CTP2 - Stage 2 LRT |
| | John Beebe (JB) | GeoProcess Research |
| | Karyn Cornfield (KC) | MH – CIS & EA PM |
| | Kelly Roberts (KR) | MH – EA Lead |
| | Sarah MacKelvie (SM) | MH – EA |
| | Ved Proag (VP) | MH – Stage 2 LRT |
| | Karine Bertrand (KB) – via telecom | MH – Stage 2 LRT |

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|---|---|---|
| **Regrets:** | Eric Emery (EE) | MH – Stage 2 LRT |
| | Ryan Polkinghorne (RP) | City of Ottawa |
| | Elizabeth Murphy (EM) | City of Ottawa |
| | Julia Robinson (JR) | City of Ottawa |
| | Susan O'Connor (SO) | City of Ottawa |
| | Chris Rogers (CR) | City of Ottawa |
| | Arto Keklikian (AK) | NCC |
| | Michael Muir (MM) | NCC |
| | Greg Kehoe (GK) | NCC |
| | Ferdous Ahmed (FA) | RVCA |
| **Acronyms** | CIS – Cumulative Impacts Study<br>CTP2 – Capital Transit Partners (Stage 2)<br>EA – Environmental Assessment<br>GPRA – GeoProcess Research Associates<br>JFSA – J.F. Sabourin and Associates<br>LRT – Light Rail Transit<br>MOECC – Ministry of Environment and Climate Change<br>MSF – Maintenance Storage Facility<br>MH – Morrison Hershfield<br>NCC – National Capital Commission<br>PE – Preliminary Engineering (LRT)<br>PSOS – Project Specific Output Specification<br>RVCA – Rideau Valley Conservation Authority | |

**Agenda:**

1. Welcome/Introductions/Background (Darlene Conway, City of Ottawa)
2. Overview (Karyn Cornfield, Morrison Hershfield)
   - 2.1. Purpose of Study
   - 2.2. Project Team & Status of Work
   - 2.3. Schedule of Milestones
   - 2.4. Stakeholder/Agency Involvement
3. Baseline/Woodroffe SWM Retrofit Pond Class EA (Kelly Roberts, Morrison Hershfield)
   - 3.1. EA objectives, process, issues
   - 3.2. Confirmation of preferred pond option
4. Pinecrest Creek CIS (Heather Wilson, J.F. Sabourin and Associates)
   - 4.1. CIS purpose, process, steps and tasks
   - 4.2. Confirmation of footprints of future projects and development
   - 4.3. Fluvial Geomorphology (John Beebe, GeoProcess Research Associates)
5. Key Milestones & Next Steps (Karyn Cornfield, Morrison Hershfield)

**Presentation Materials:**

The PowerPoint presentation delivered during this meeting is attached to these minutes.

| ITEM | MINUTES | ACTION BY |
|---|---|---|
| 1. | **Welcome/Introductions/Background (Darlene Conway, City)**<br><br>City (DC) introduced the study, providing background on previous studies completed by the City and the NCC within the Pinecrest Creek watershed and the genesis of the request from NCC to complete a Cumulative Impact Study (CIS) for Pinecrest Creek.<br><br>CTP2 (CW) briefly explained the correlation between this study and Stage 2 of the LRT, noting that the results of the CIS are required to inform the LRT preliminary engineering deliverable, namely, the PSOS (Project Specific Output Specification), which needs to be completed by December 2016, in order to avoid the need for a large addendum during the Open Market period (February - December 2017) prior to award of contract in 2018. For this reason, the City has directed CTP2 to undertake the study to ensure that it is completed in a timeline that supports the Stage 2 LRT deadlines.<br><br>NCC (DM): Does the LRT affect scope of the CIS and EA work?<br><br>CTP2 (CW): LRT only drives the schedule and does not influence scope (i.e., LRT is one of a number of projects/impacts for which cumulative impacts will be assessed.) | |
| 2. | **Overview (Karyn Cornfield, Morrison Hershfield)**<br>2.1. Purpose of Study<br>2.2. Project Team & Status (Work Completed to Date)<br>2.3. Stakeholder/Agency Involvement<br><br>Refer to the Presentation Material for details on the above topics. | |

| | | |
|---|---|---|
| 3. | **Baseline/Woodroffe Pond EA (Kelly Roberts, Morrison Hershfield)**<br>Refer to Presentation Material.<br><br>**3.1. Discussion of EA objectives, process, issues**<br>MH (KR): The Class EA falls under Schedule B due to property acquisition requirements associated with the pond. Therefore, the EA will include a public review component.<br>NCC (DM): What is the final product of the CIS (plan or program)? Is it subject to a Strategic EA? Will the study recommend an implementation program for mitigation measures? Is there a plan for land use?<br>City (DC): Each City project has its own EA and mitigation recommendations. The CIS will assess the cumulative impacts on Pinecrest Creek of all these projects and recommend additional mitigation measures, if required; this level of assessment could not be achieved by considering the separate provincial EA's. The recommendations and proposed implementation schedule coming out of the CIS will be presented to City Council for endorsement and to demonstrate City commitment to moving forward with SWM retrofits.<br>MH (KR) – A Strategic EA should not be required as there is not a federal program or policy being implemented.<br><br>NCC (JM): Is approval of the Baseline/Woodroffe pond being sought in advance of completion of the CIS?<br>City (DC): No – approval of pond functional design is being sought fully in parallel with CIS.<br><br>**3.2. Confirmation of Preferred Pond Option (1 or 2)**<br><br>NCC (JM): NCC preference for Option 1, as per the report "Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue" (JFSA, 2015), is subject to technical requirements that need to be satisfied with any pond on NCC lands. NCC can revisit its decision if they are presented with additional constraints that may affect their preference. NCC has consistently preferred Option 1 while Option 2 would require significant changes.<br><br>City (DC): To move forward with modeling work to assess cumulative impacts the study team needs confirmation from the NCC of the preferred option. Any outstanding technical issues or requirements can continue to be addressed within the context of confirming the final functional design. | |

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|---|---|---|
| | RVCA (JC): The RVCA does not have a preference for either pond option as both options perform similarly (hydraulically). The RVCA will be more interested in the technical details (e.g. pond connections to the watercourse) rather than the aesthetics and will be more involved during the detailed design stage.<br><br>City (ES): Operations Group would be most concerned about access to the inlet and outlet structures for maintenance purposes.<br><br>JFSA (CB): The inlet and outlet locations and configurations proposed for the two options are identical and thereby the maintenance requirements would likely be the same for both options.<br><br>NCC (BC): Why are TSS Removal rates “almost 80%”?<br><br>JFSA (CB): The results of the hydrologic/hydraulic analyses for the pond indicate that a small portion of the flow from a 25 mm storm event would flow directly over the grade control riffle. Therefore the pond may not function precisely as assumed in the MOECC SWM Manual in terms of TSS removal (e.g. for 80% TSS removal). However, as the facility captures the majority of the 25 mm storm runoff, a TSS removal rate in excess of 60% would be achieved and likely very close to 80%. Through the detailed design stage it may be possible to confirm whether this rate actually reaches 80% TSS removal.<br><br>GPRA (JB): The flow over the grade riffle (as described above) is due to the ponds proposed inlet/grade riffle/outlet configuration, which provides for some runoff from those events to flow through the reach between the riffle and the outlets – had to let some water through for those events.<br><br>CW asked at what level of the NCC is the decision re: the preferred option made?<br><br>NCC (DM): This decision would be at the staff level.<br><br>NCC (BC): Requested that greater than the 100yr event be assessed.<br><br>City (DC): Yes, a larger event will be modeled. | |

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|---|---|---|
| **4.** | **Pinecrest Creek CIS (Heather Wilson, JFSA; John Beebe, GPRA)**<br><br>**4.1. CIS purpose, process, steps and tasks**<br>Refer to Presentation Material.<br><br>**4.2. Confirmation of footprints of future projects and development**<br>CW provided the following context on LRT and related projects:<br>• LRT footprint to be constructed by 2023 ends at Baseline Station. Timing of works beyond Baseline Station, including Tallwood Station and Maintenance Storage Facility, is unknown, although the Preliminary Engineering (PE) for this section is currently included with the PE of Stage 2.<br>• A half-up, half-down solution at the Iris crossing was recommended in the EA in order to maintain grade separation. This arrangement will be carried forward for PE. The EA recommends a realignment of the Pinecrest Creek and new culverts just downstream of Iris.<br>• Baseline Station will accommodate storage of four trains in the interim (prior to or instead of long term Woodroffe MSF).<br>• Existing Queensview station will be decommissioned.<br><br>**4.3. Fluvial Geomorphology**<br>Refer to Presentation Material.<br><br>Pinecrest Creek has two areas with erosion risk that may require work; one is located upstream of Iris and the other is located downstream of the Queensway just below a small pedestrian bridge. The erosion area at Iris may require a relatively simple solution while the Queensway location will be more difficult /costly to address. A monitoring effort may be required in the future.<br>The timing of project implementation, and if the Creek can live with what is being “asked” if there is a lag in implementation, has always been a concern.<br>NCC (JM): Will the CIS include the uncommissioned outfall for SW Transitway? DC responded that the outfall would be included. | |

| | | |
|---|---|---|
| **5.** | **Key Milestones & Next Steps (Karyn Cornfield, MH)**<br><br>CTP2 will invite NCC, City, and RVCA to attend a workshop regarding potential solutions for LRT issues regarding Pinecrest Creek (primarily dealing with the floodplain and the Pinecrest Creek Enclosure). CTP2 will organize this workshop when solutions are identified and confirmed as feasible (end of March). Agency feedback will be required on this issue in order for CTP2 to complete the Preliminary Engineering for Stage 2 LRT and provide input back into the CIS.<br><br>Technical memos and reports will be circulated to the TAC for review. Three memos (March, April, May) for the CIS and an Interim Report on the EA (April) will be circulated prior to TAC 2 (June) and then additional memos and report will follow. ***Post meeting note****: Given the tight timeline for the study to support Stage 2, there will be limited time to provide comments on some critical path items such as detailed hydrologic/hydraulic modeling. The City will be undertaking a detailed review of the modeling.*<br><br>An NCC pond design review meeting is currently planned for September however it may be better to schedule this meeting earlier.<br><br>NCC (JM): Minimal landscape changes are expected from NCC for Option 1.<br><br>RVCA (JC) requested a copy of the schedule and the list of documents to be reviewed by the RVCA. MH (KC) confirmed that a list of milestones will be provided attached with the minutes.<br><br>NCC (MB) does not see any mention in the project milestones of NCC approval of pond and requested a clarification of the project's incorporation of the required approvals. City (DC) explained that a letter of endorsement subject to detailed design of the pond would be requested from the NCC. City (DC) further mentioned that the procurement approach for the future detailed design and construction of the pond have not been decided to date.<br><br>NCC(JM): Would the SWM pond be built as part of the LRT?<br><br>CTP2 (CW): Decision on pond detailed design/construction and whether it will be "bundled" with Stage 2 LRT has not been made<br><br>City (MM): A letter from Chris Swail will be issued shortly to the NCC stating that the Stage 2 LRT is "not a designated project under CEAA within the regulations". | **CW/KC**<br><br>**KC** |

Next TAC Meeting: June 2016 (TBD)

Dist: Participants and Regrets

**Pinecrest Creek Cumulative Impacts Study and Baseline/Woodroffe Pond Class EA – Schedule Summary for the Technical Advisory Committee**

| Milestone | Timing | Baseline/Woodroffe SWM Facility - Class EA | Pinecrest Creek CIS |
|---|---|---|---|
| TAC Meeting 1 | February 25, 2016 | Discussion of EA objectives, process, issues, consultation, and required input from Agencies. Confirm pond footprint with NCC. | Discussion of CIS objectives, process, and issues. Confirmation of future development & footprints for major projects. |
| Tech Memo 1A | March 31, 2016 | | Hydrologic/Hydraulic Model Results for Existing Conditions (2015 SWS Update). Circulate to TAC. |
| Tech Memo 1B | April 15, 2016 | | Existing Conditions: Results (Fluvial G, Water Quality). Circulate to TAC. |
| Tech Memo 2 | June 1, 2016 | | Modelling Results: Future Ultimate Conditions (Controlled & Uncontrolled). Circulate to TAC. |
| Interim EA Report | May 1, 2016 | Interim EA Report: Phase 1 and Phase 2 (Existing Conditions) | |
| TAC Meeting 2 | June 2016 | Confirm evaluation and preferred alternative. Present interim EA report with work done to date. | Presentation of modelling results for Future Conditions (Controlled & Uncontrolled). Confirmation of Interim Scenario. |
| Technical Memo 3 | July 2016 | | Modelling Results for Interim Scenario and Cumulative Impacts (comparison of existing conditions with future – ultimate condition with interim scenario). Circulate to TAC. |
| Technical Memo 4 Provisional | August 2016 | | Confirmation of Cumulative Impacts Assessment and optimal combination of proposed mitigation measures/trade-off projects/in-stream works (conceptual design & cost estimate). Circulate to TAC. |
| Pond Design Meeting with NCC | Sept 2016 | Presentation of functional design and landscape concept plan | |
| On-Line Open House | Sept 2016 | Presentation of the EA project and the proposed pond configuration. | |
| TAC Meeting 3 | Sept 2016 (or earlier depending on need for Mitigation) | Present Draft EA report | Presentation of Interim Scenario result and Cumulative Impacts Assessment. Identification of optimal combination of SWM/SWM retrofits/mitigation measures/trade-off projects and additional in-stream works. Include conceptual design/ cost estimate for in-stream works and assignment of responsibility for these works. |
| Draft CIS Report | Sept 2016 | | Incorporate comments on Tech Memos. Circulate to TAC. |
| Draft EA Report | Oct 2016 | Incorporate comments from open house and circulate to TAC | |
| Final EA Report | Nov 2016 | For public review | |
| Final CIS Report | Nov 2016 | Circulate to TAC | Circulate to TAC |

# Pinecrest Creek Cumulative Impacts Study and Baseline/Woodroffe SWM Pond Municipal Class EA

*Technical Advisory Committee*
*Meeting #1 February 25, 2016*

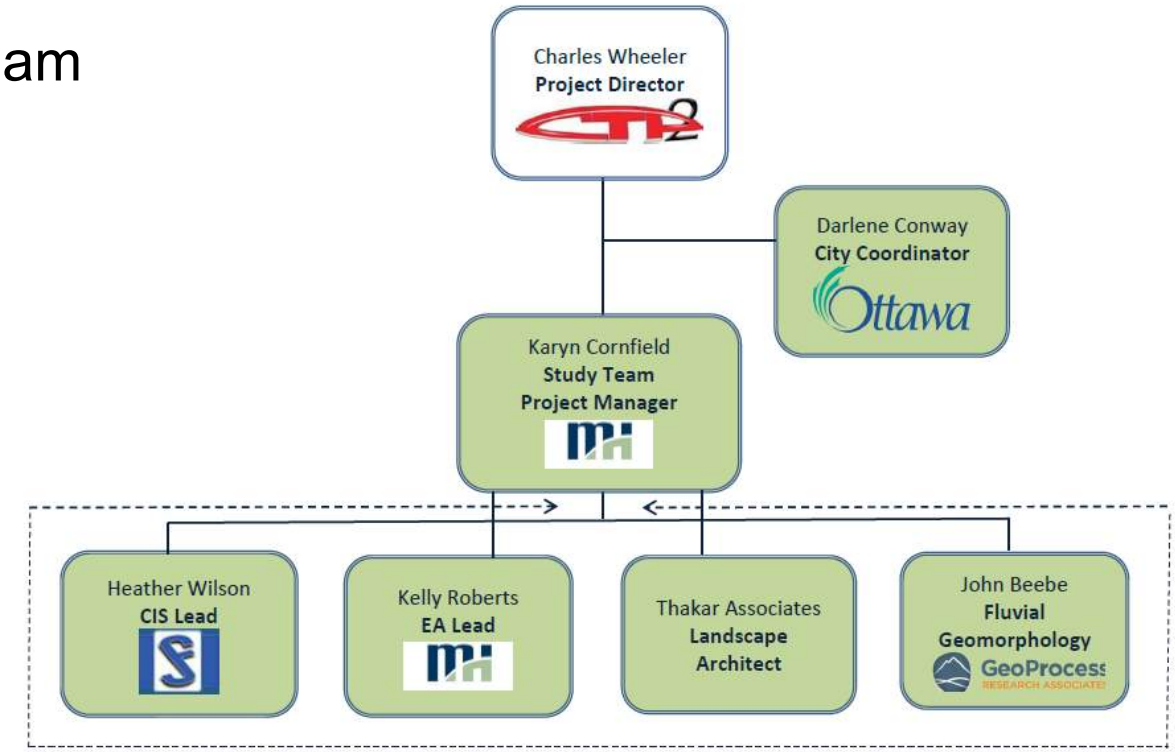
MORRISON HERSHFIELD

# Agenda

- Welcome/Introductions/Background (Darlene Conway, City of Ottawa)
- Project Overview (Karyn Cornfield, Morrison Hershfield)
  - Project Scope, Team, Status, Schedule
  - Stakeholders/Agency Involvement
- Baseline/Woodroffe Pond EA (Kelly Roberts, Morrison Hershfield)
  - EA objectives, process and issues
  - Confirmation of pond option
- Pinecrest Creek CIS
  - CIS purpose and process
  - Footprints of future projects and development
- Milestones & Next Steps

# Introductions

- Project Team

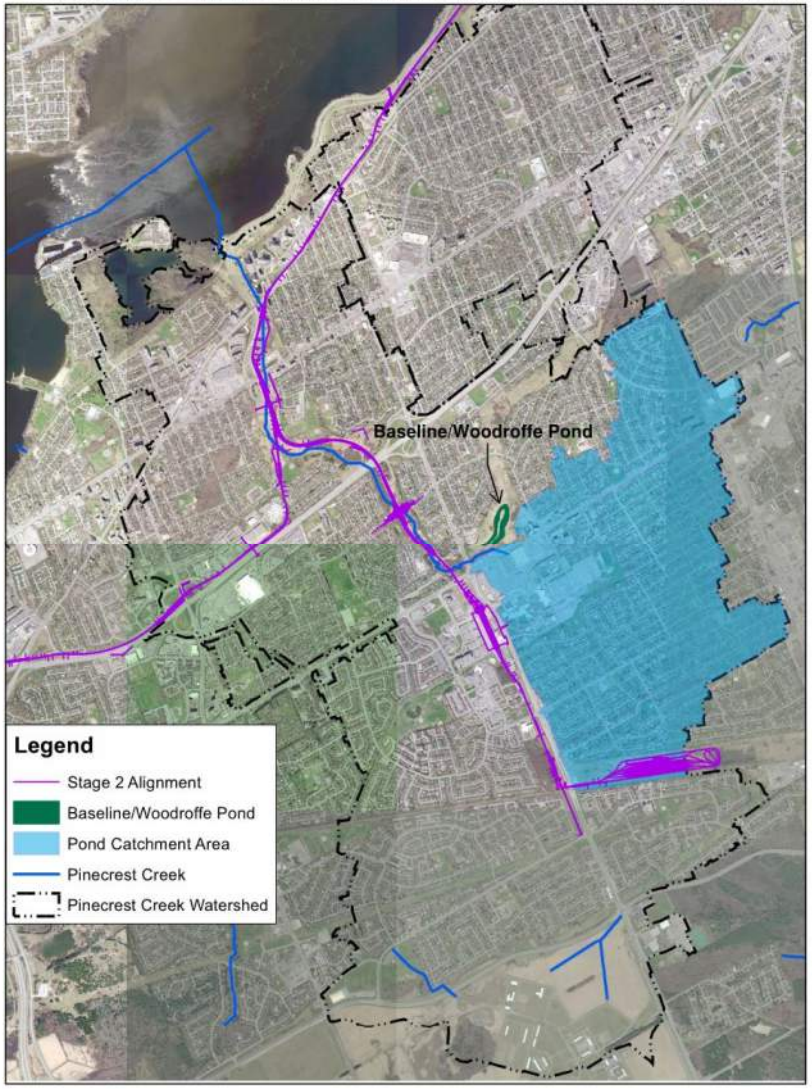





MORRISON HERSHFIELD

# Project Overview

## Baseline/Woodroffe SWM Facility within Pinecrest Creek Watershed



# Project Overview

- Class EA: Baseline Woodroffe SWM Retrofit Pond
  - Functional design completed by JFSA in 2015 to be confirmed through this study
  - Provincial Class EA requirements will be addressed herein - and to the extent possible the federal EA requirements (to inform detailed design)

- CIS: Pinecrest Creek Cumulative Impacts Study
  - To identify and recommend mitigation for cumulative impacts on Pinecrest Creek due to 'Future Projects' including Baseline/Woodroffe SWM Pond, Western LRT, and other projects & infill development; and also effects of proposed SWM retrofits (lot level/ conveyance) over the next 20 years +/-
  - CIS will also inform the Preliminary Engineering for LRT

# Project Status

- Pond EA: Existing Conditions
  - Background materials being reviewed
  - Building on previous reports/studies
- Creek CIS: Hydrologic/hydraulic Model
  - Existing conditions model currently being updated to reflect current SWS conditions
- TAC Meeting 1 focus
  - To introduce the EA & CIS
  - To confirm preferred pond option with NCC
  - To confirm footprints of major projects to inform the CIS

# Schedule

- CIS and LRT inputs
  - LRT Preliminary Engineering (30% design) finish date July 29, 2016
  - LRT PSOS (Project Specific Output Specification) finish date December 13, 2016
  - CIS (& EA) will be completed by November 2016
  - Water level modelling results from CIS are required to inform LRT

# Stakeholders/Agency Involvement

- Provincial
- First Nations
- Federal
- Utilities

# Schedule

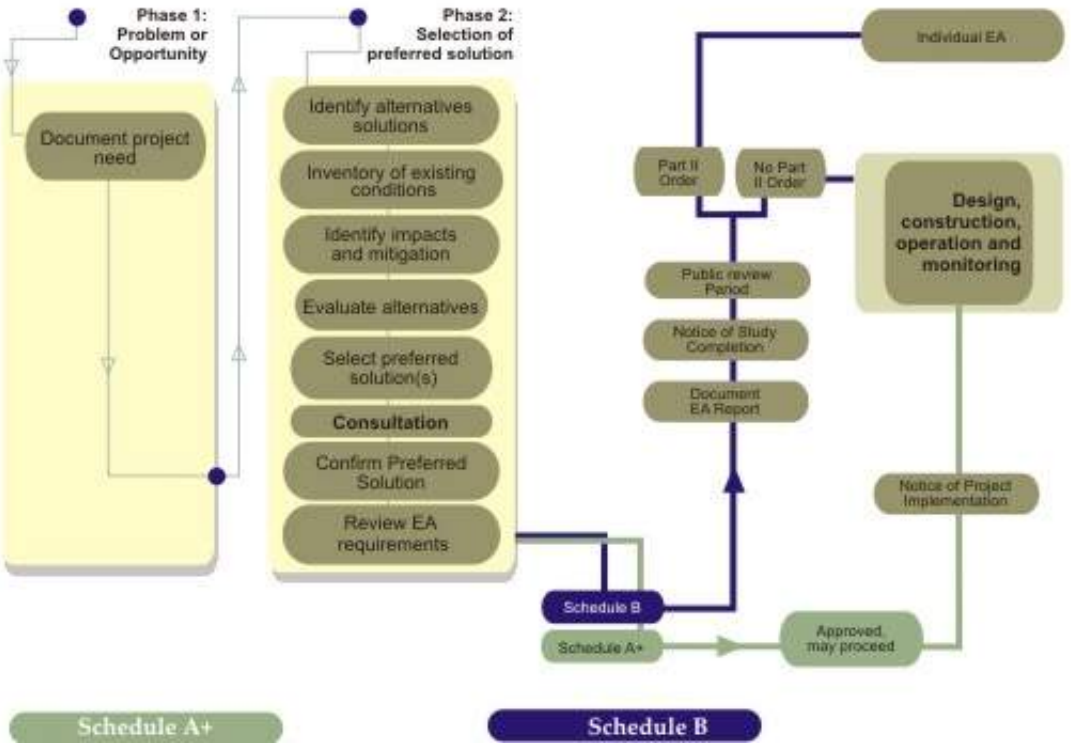
| Milestone | Timing | SWM Pond EA | Pinecrest Creek CIS |
|---|---|---|---|
| **TAC 1** | **Feb 25** | **Introduce EA, confirm pond footprint** | **Introduce CIS, confirm major projects** |
| Tech Memos to City | March-May | | Modelling results |
| Interim EA Report | May | Phase 1 & 2 (Existing Conditions) | |
| TAC 2 | June | Interim EA work | Future condition results.<br>Confirm Interim Scenario |
| Tech Memo to City | July | | Interim & Cumulative Impacts |
| NCC Pond Design Meeting | September | Functional design & landscape concept | |
| Open House | September | Present EA project and pond design | |
| TAC 3 | September (or earlier depending on need for mitigation) | Draft EA report | Interim Scenarios/Impacts Assessment (provisional: mitigation) |
| Draft CIS & EA Reports | Sept-October | | |
| Final CIS & EA Reports | November | | |

Baseline/Woodroffe SWM Pond Municipal Class EA

# Objectives

- Problem: *Managing the historical impacts of development on Pinecrest Creek*
- Review previous work
  - February 2010 Ottawa River Action Plan (ORAP)
  - October 2011 Pinecrest Creek/Westboro SWM Retrofit Study (P/W study)
  - June 2015, Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (Feasibility Study)
- Recognize NCC interests
  - Land owner
  - Compliance with CEAA in co-ordination with CIS

# Class EA Process



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# Issues

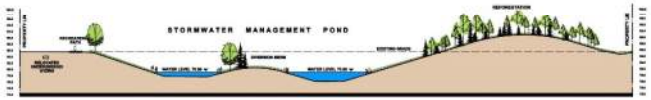
- Recognition of previous work
  - Avoid duplication
  - Provincial EA context
  - CEAA EA determination
- Public stakeholders
  - Government
  - Public
- Integration with CIS
  - Synergies
  - Divergences

# Confirmation

- Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue
  - Revised/update functional design per the Class EA to determine a preferred design
  - Confirm pond footprint option (1 or 2)
  - Pond sizing

# Pond Option 1


SECTION A




SECTION B

LEGEND

PROPOSED
- STORMWATER RETENTION POND
- MEADOW
- MOWN GRASS
- REFORESTATION PLANTING
- LARGE TREE PLANTING
- SHRUB PLANTING
- 3m ASPHALT RECREATIONAL PATH
- CONTOURS (1.0m INTERVALS)
- 50m DRAW DOWN LIMIT

EXISTING
- CONTOURS (.5m INTERVALS)
- HYDRO POLE / LINE
- VEGETATION TO REMAIN

POND FEATURES / COMPONENTS
- A POND INLET
- B RIFFLE OVERFLOW 79.61
- C FLOW DIVERSION BERM
- D FOREBAY
- E FOREBAY OUTLET BERM
- F QUANTITY OUTLET
- G QUALITY LOW FLOW OUTLET
- H MAINTENANCE ACCESS ROAD
- I PINECREST CREEK

# Pond Option 2

# Preference

- NCC Preference Option 1
- Performance of both similar
  - Sizing
  - Achieve close to 80% TSS removal
  - Flood attenuation

# Pinecrest Creek Cumulative Impacts Study

# Pinecrest Creek Cumulative Impacts Study

# Purpose of Cumulative Impact Study

- To identify the cumulative impacts on Pinecrest Creek of:
  - specific projects proposed for development within Creek corridor
  - future development within the subwatershed

- To identify appropriate measures to mitigate those (negative) cumulative impacts

# Purpose of Cumulative Impact Study

To identify the cumulative impacts of these projects:

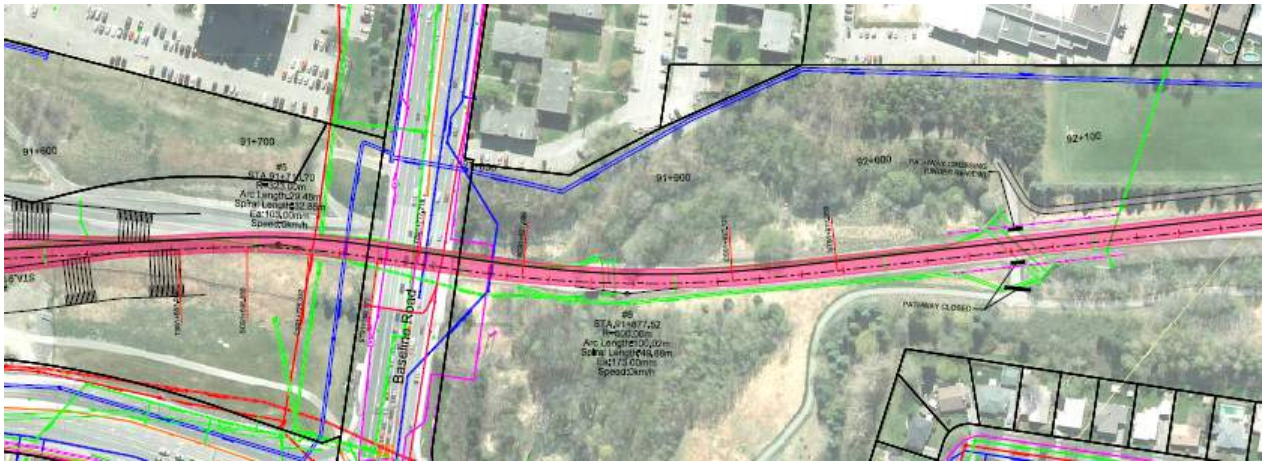
- Baseline/Woodroffe SWM retrofit pond

# Purpose of Cumulative Impact Study

- anticipated SWM retrofits throughout subwatershed

# Purpose of Cumulative Impact Study

- Western LRT and associated projects (e.g. Hwy 417 widening, Richmond Road Complete Streets)
- Baseline Road Bus Rapid Transit



# Purpose of Cumulative Impact Study

- SW Transitway extension to Hunt Club
- projected development / redevelopment to 2031 OP horizon

# Process - Steps and Tasks

1. Background documents and data
2. Preparation of models for flow, water level and water quality simulations of the following scenarios:
   - Existing conditions
   - Future conditions:
     - Uncontrolled
     - With SWM controls and retrofits (20 years +/-)
     - Interim scenario (10 years +/-)

# Process - Steps and Tasks

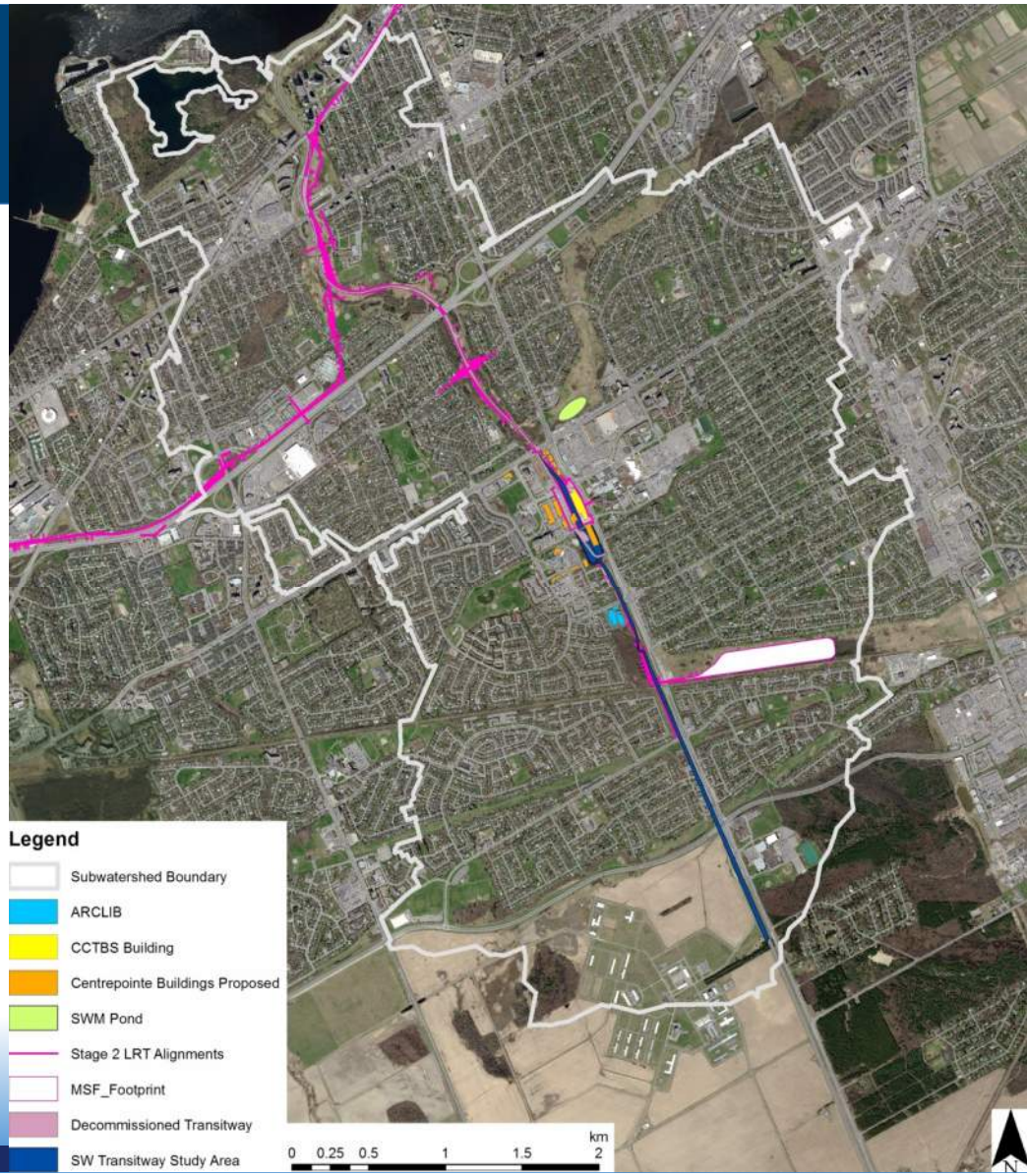
3. Assessment of cumulative impacts on:
    - Peak flows, flooding, and overall subwatershed response
    - Water quality
    - Erosion rates, channel form and function, existing infrastructure
    - Future daylighting potential
    - Area identified for use by Sir John A. Macdonald linear park

# Process - Steps and Tasks

4. Mitigation
    - combined SWM controls
    - potential trade-off projects
    - in-stream works

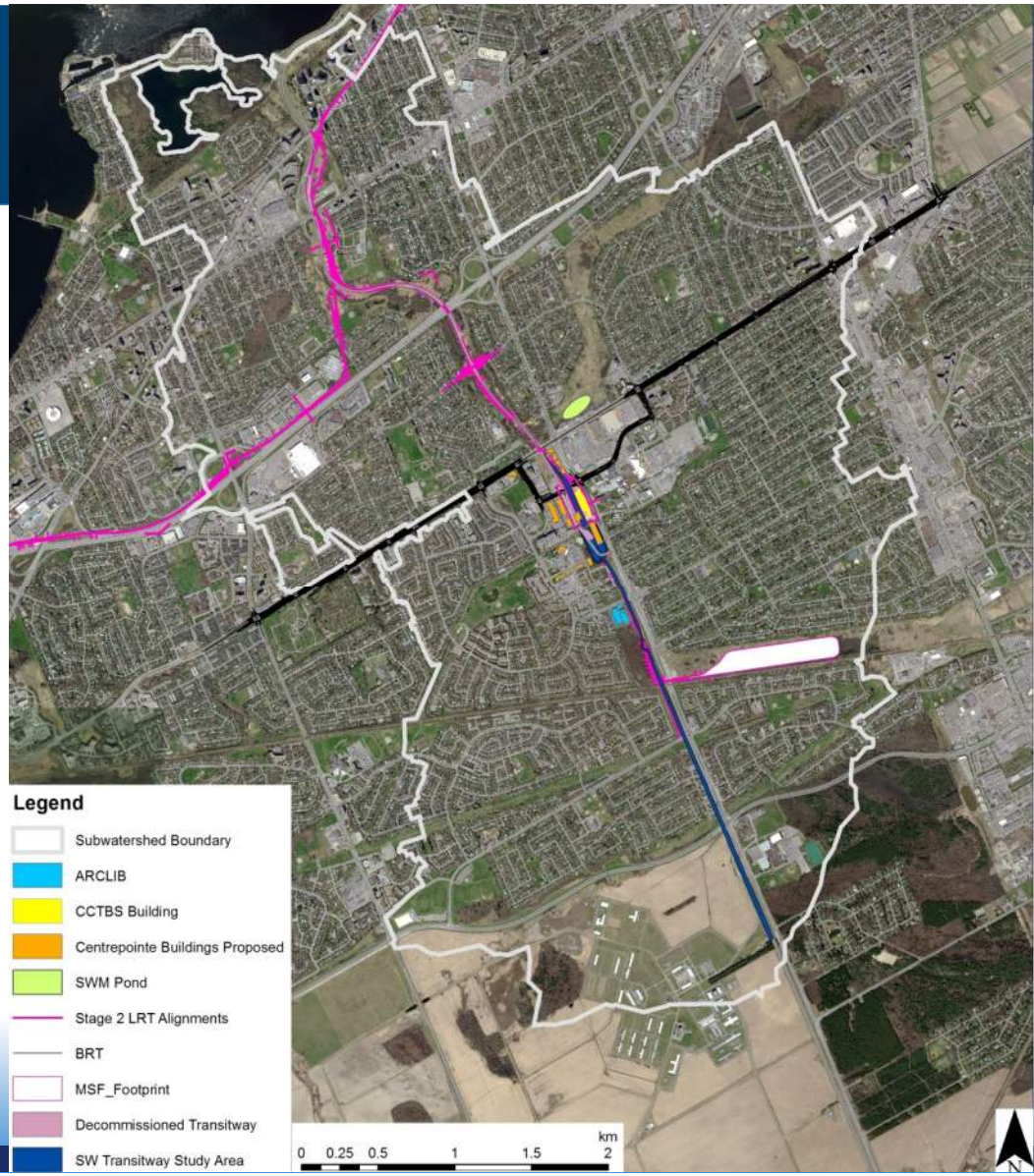
# Footprints of Future Projects

- Future projects



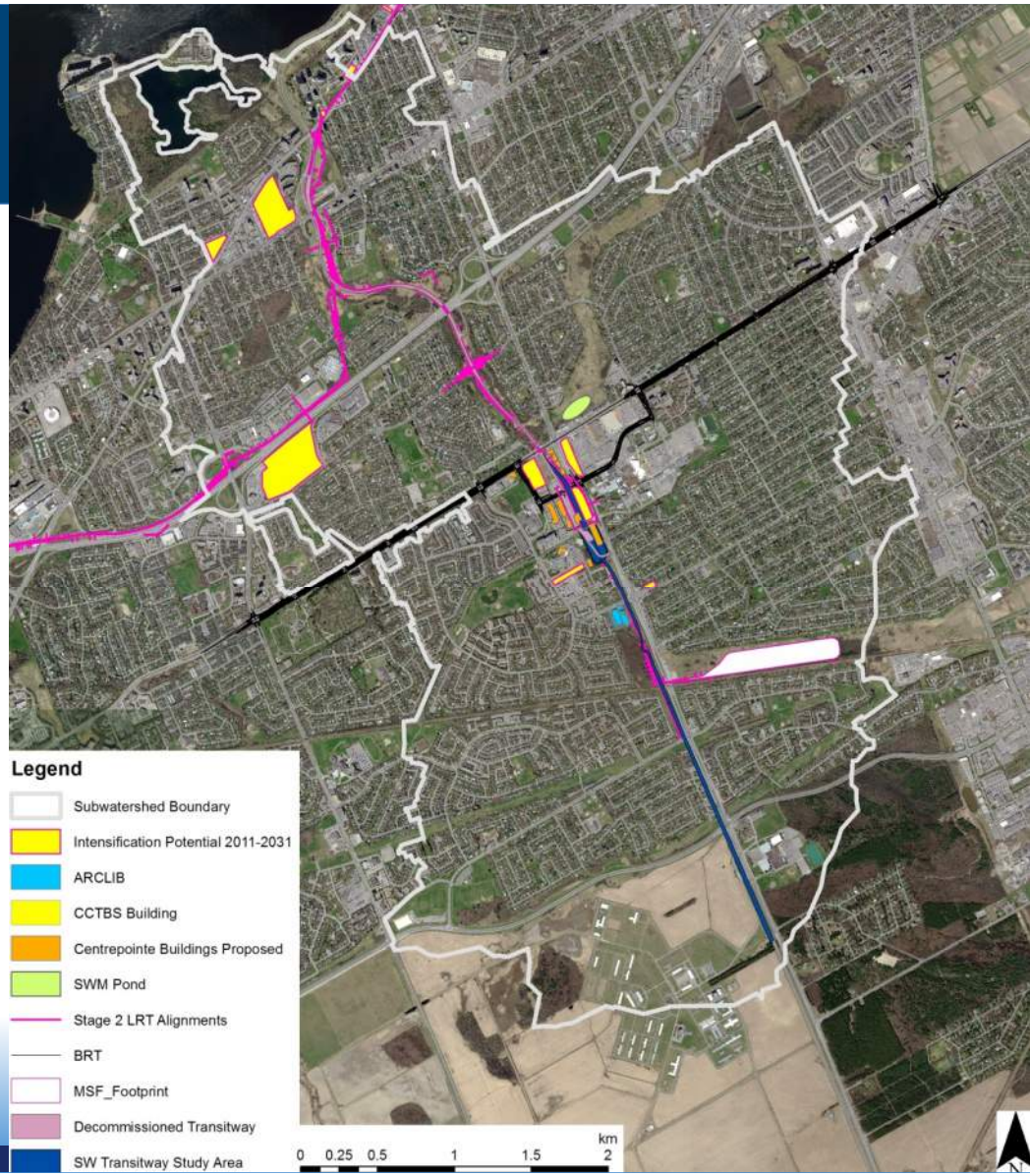
# Footprints of Future Projects

- Future projects
  with
- Baseline Road Bus Rapid Transit



# Footprints of Future Projects and Development

- Footprints of future projects with
- Baseline Road Bus Rapid Transit and
- Intensification to 2031



# Pinecrest Creek Cumulative Impacts Study
# - Fluvial Geomorphology

GeoProcess
RESEARCH ASSOCIATES

MORRISON HERSHFIELD

# Evolution of Erosion Sensitivity : 2006-2012-2016

Existing Conditions Update

- Studied since 2006
- Restoration Plans completed
- Some areas are adjusting
- Some areas still at risk

- Field work will update the stability mapping to point to areas for monitoring

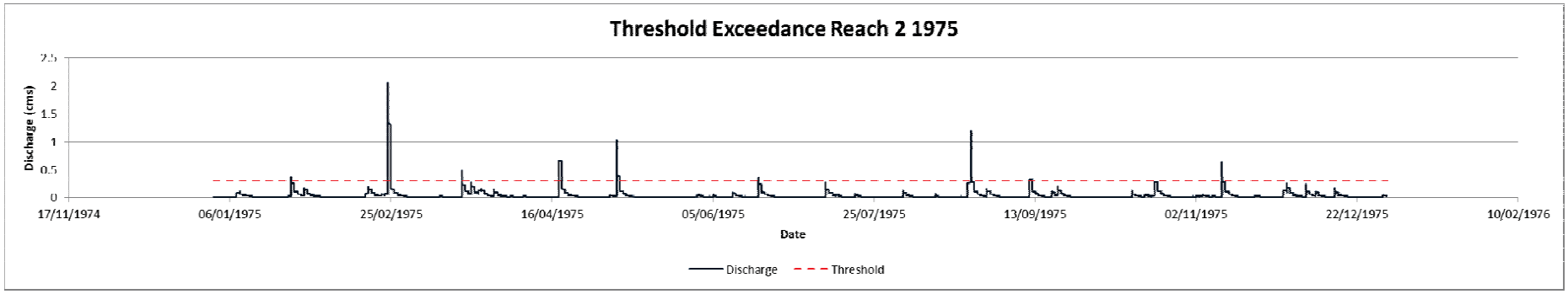
**2006**

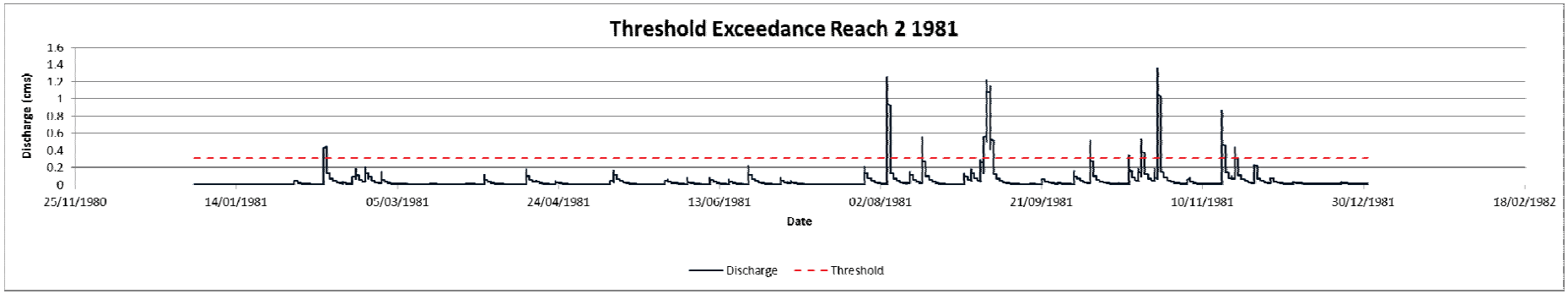
| Reach 5: Transitway Culvert to Woodroffe Culvert | | | | | | |
|---|---|---|---|---|---|---|
| Station | Easting | Northing | Factor | Severity | Stability | Priority Class |
| 4+275 | 362405 | 5023778 | Human | | | |
| 4+295 | 362417 | 5023792 | Redirection | | | |
| 4+313 | 362423 | 5023808 | Natural | | | |
| 4+335 | 362442 | 5023805 | Human | | | |
| 4+346 | 362450 | 5023798 | Human | | | |
| 4+355 | 362459 | 5023797 | Natural | | | |
| 4+373 | 362475 | 5023804 | Human | | | |
| 4+390 | 362472 | 5023811 | Natural | | | |
| 4+405 | 362466 | 5023822 | Human | | | |
| 4+420 | 362478 | 5023829 | Human | | | |
| 4+434 | 362491 | 5023833 | Human | | | |

**2012**

| Reach 5: Transitway Culvert to Woodroffe Culvert | | | | | | |
|---|---|---|---|---|---|---|
| Station | Easting | Northing | Factor | Severity | Stability | Priority Class |
| 4+275 | 362405 | 5023778 | Human | | | |
| 4+295 | 362417 | 5023792 | Redirection | | | |
| 4+313 | 362423 | 5023808 | Natural | | | |
| 4+335 | 362442 | 5023805 | Human | | | |
| 4+346 | 362450 | 5023798 | Human | | | |
| 4+355 | 362459 | 5023797 | Natural | | | |
| 4+373 | 362475 | 5023804 | Human | | | |
| 4+390 | 362472 | 5023811 | Natural | | | |
| 4+405 | 362466 | 5023822 | Human | | | |
| 4+420 | 362478 | 5023829 | Human | | | |
| 4+434 | 362491 | 5023833 | Human | | | |

# Erosion Threshold Exceedance at Critical Nodes




GeoProcess
RESEARCH ASSOCIATES

# Geomorphology Results

- Comparison of the existing, interim and future conditions results
  - What, if any, interventions may be required
  - Potential for in-stream works
  - Monitoring areas of concern instead to see if they repair themselves
- Particular interest is being paid to the interim condition and the length of time this situation may be in place.
  - Potential for temporary measures

# Milestones

| Milestone | Timing | SWM Pond EA | Pinecrest Creek CIS |
|---|---|---|---|
| **TAC 1** | **Feb 25** | **Introduce EA, confirm pond footprint** | **Introduce CIS, confirm major projects** |
| Tech Memos to City | March-May | | Modelling results |
| Interim EA Report | May | Phase 1 & 2 (Existing Conditions) | |
| TAC 2 | June | Interim EA work | Future condition results.<br>Confirm Interim Scenario |
| Tech Memo to City | July | | Interim & Cumulative Impacts |
| NCC Pond Design Meeting | September | Functional design & landscape concept | |
| Open House | September | Present EA project and pond design | |
| TAC 3 | September (or earlier depending on need for mitigation) | Draft EA report | Interim Scenarios/Impacts Assessment (provisional: mitigation) |
| Draft CIS & EA Reports | Sept-October | | |
| Final CIS & EA Reports | November | | |

# Next Steps

- CIS
  - Existing Conditions (Tech Memos to City - April)
  - Future Conditions Modelling Results (Tech Memo to City – May)
  - TAC 2 (June)
    - Presentation of Future Conditions Model and Confirmation of Interim Scenario
- EA
  - Filing of Notice of Commencement
  - Completion of Phase 1 and Phase 2 (Existing Conditions)
  - Interim EA Report (May)

Questions or Comments?

**From:** Barakengera, Martin [mailto:martin.barakengera@ncc-ccn.ca]
**Sent:** Tuesday, December 20, 2016 4:57 PM
**To:** 'Conway, Darlene' <Darlene.Conway@ottawa.ca>
**Cc:** [redacted]
**Subject:** RE: Baseline/Woodroffe pond - questions from public re: NCC involvement and approvals

Hi Darlene,

Apologies for my delayed response. Answers are provided in red next to each question.

Regards,

Martin Barakengera MCIP RPP PMP
Senior Land Use Planner - Planificateur principal, utilisation du sol
Capital Planning - Aménagement de la capitale
National Capital Commission - Commission de la capitale nationale
202 - 40 Elgin, Ottawa, ON CANADA, K1P 1C7
tel: 613-239-5678 ext. 5196
www.ncc-ccn.gc.ca

**From:** Conway, Darlene [mailto:Darlene.Conway@ottawa.ca]
**Sent:** Friday, December 16, 2016 12:37 PM
**To:** Barakengera, Martin
**Cc:** [redacted]
**Subject:** Baseline/Woodroffe pond - questions from public re: NCC involvement and approvals

Hello, Martin. I have recently received questions from the public regarding NCC's involvement with the pond and provide them here:

re: NCC:
I am assuming that your submission is under review in Capital Planning Branch, Federal Approvals and Environment and that Mr. Mike Muir has been involved from the onset (he is copied on the

2010 letter). Yes

Questions: Can you provide specific details of the review program and decision timing? What role is Mr. Muir playing in this approval process? The pond is going through a Level 2 design review. Level 2 design approval projects are reviewed by a cross functional work group of NCC staff, then presented to an Internal Design Review Committee (IDRC) – which has been done, and finally once the design has been revised and finalized to staff's satisfaction, the project is sent to an executive committee of the NCC Board for approval, via an E-vote. After the Board approves the project, the executive director of the Capital Planning Branch signs the approval. Mike Muir is generally consulted on all approvals on NCC lands within his land management area.

Board members [of the Bel Air Community Association] expressed disappointment that Mr. Muir did not disclose any information on the City's plans when he attended a meeting six months ago to discuss potential improvements to the same green space. Noted

Charles has advised that NCC will not be attending the January 9th public meeting. Anticipating that these and similar questions will be asked, do you have a preference as to how such questions are to be directed and/or addressed? It may be helpful to meet to discuss prior to the public meeting.

Regards.

DEC

**Darlene Conway, P. Eng.**
Senior Project Manager / Policy Development and Urban Design
Gestionnaire principal de projet / Service d'urbanisme et de la gestion de la croissance

City of Ottawa Ville d'Ottawa
613.580.2424 ext./poste 27611
ottawa.ca/planning ottawa.ca/urbanisme

## Baseline/Woodroffe pond Class EA and Pinecrest Creek Cumulative impacts study

## Meeting with NCC

December 7, 2015
1:00pm – 2:30pm
NCC – Room 509

**Present:**

| | |
|---|---|
| Darlene Conway (DEC) | City of Ottawa, Infrastructure Policy Unit |
| David Malkin (DM) | NCC, Capital Planning Branch |
| Julie Mulligan (JM) | NCC, Capital Planning Branch |

**Regrets:**

| | |
|---|---|
| Michael Muir | NCC, Capital Stewardship Branch |

## Meeting Notes

**1. Overview and general discussion:**
DEC provided an overview of the work completed to date to arrive at the draft Terms of Reference (ToR) for the study. The proposed pond was a recommendation of the Pinecrest Creek/Westboro SWM Study (2011). Its implementation was moved forward in conjunction with the construction of a new (but uncommissioned) storm outfall for Baseline transit station. Based upon previous consultations with NCC, this cumulative impacts study (CIS) is required to assess the cumulative impacts of the pond/other identified projects/future retrofits/projected developmentwithin the subwatershed.

**2. Review pf NCC comments on draft Terms of Reference:**
DEC noted most comments/track changes accepted and ToR revised accordingly.

With respect to the following comments:

> *3.1 Existing Conditions:*
> *v) Assessment of existing conditions of the Landscape character and ecological integrity of the Pinecrest Creek corridor*
> *vii) Assessment of the recreational attributes of the corridor*
> *3.3 Assessment of Cumulative Impacts:*
> *Assessment of any potential effects on the landscape character and ecological integrity of the Pinecrest Creek corridor*
> *Assessment of any effects on the viability a recreational corridor:*

DEC noted that the effects of the pond, including the immediate landscape, will be explicitly addressed by the CIS but indicated that, for the remainder of the creek corridor, landscape/recreational aspects would be best addressed via the preliminary engineering (PE) for the Western LRT with the understanding that the outcomes of the CIS (hydrologic/hydraulic/water quality/stream function impacts) would be used to inform that work.

JM noted concerns re: landscape impacts and pathway continuity (recreational issues) but concurred these items do not have to be addressed via the CIS as long as they are recognized as key issues to be addressed via the PE process. She also noted the committee structure that the PE team had previously

presented to NCC staff, indicating she expected that integration between the CIS and the overall PE would be allowed for via that structure.

DM asked how the CIS would address EA requirements for the proposed pond. DEC noted CEEA requirements could not be fully met by this study at it will not include detailed design of the facility. However, the study will aim to provide sufficient information to facilitate the required approvals for the subsequent detailed design.

JM expressed outstanding concerns with respect to the fluvial impacts of the "trade-off" proposed in the pond Feasibility Study. DEC noted that the fluvial-g work completed for that study indicated this should not be a concern but this will be re-confirmed.

JM noted the proposed Maintenance Storage Facility and DEC confirmed this would be accounted for in the CIS.

With respect to the comment re: "*the need to acknowledge that any works in the lower reach, at the Ottawa River, are to be proposed within the context of NCC plans for an enhanced linear park experience along the SJAM Parkway corridor*," JM noted that NCC was considering a boardwalk in this location and that Baird Associates had prepared a feasibility report for NCC. *[Post-meeting note: NCC has provided a copy of the (still internal) Baird report on condition of its use for this project only and no further distribution.]*

With respect to the comment that: "*the ToR explicitly state that 100 year flooding needs to be addressed relative to the WLRT, since this has potential to have a significant impact on the corridor landscape,"* DEC noted that this would also be best addressed via the PE exercise with input from the CIS.

JM asked whether climate change would be taken in to account for the 100 year event? DEC indicated that the CIS would include sensitivity analyses (a range of events).

JM asked whether expanding the floodplain (via excavation) upstream of the creek enclosure south of Carling would assist in lowering 100 yr water levels. DEC indicated that, while this may benefit stream resilience (for high frequency events), it would not have much if any impact on the 100yr water level given the magnitude of peak flows and existing hydraulic constraints at this location relative to the storage that could be provided.

JM noted that a key goal of NCC's for Pinecrest Creek is a viable resident fishery (regardless of the barrier to fish movement up from the Ottawa at the enclosure inlet); with the "flashy" hydrology, there is a need for refuge areas/floodplain pools.

DM requested how future retrofits will be accounted for. DEC noted that the ToR identifies a number of scenarios to be assessed (interim/ultimate depending on the projected timing of various works and retrofits) and this will also include an "uncontrolled" scenario. JM requested that a sensitivity analysis (per the 100yr event noted above) be undertaken for the "uncontrolled" scenario also.

**3. Clarifications re: NCC e-mail of September 25, 2014 from Edith Lavallee:**
With respect to NCC's preferred pond option (per the 2015 JFSA Feasibility Study), JM confirmed Option 1 was preferred over Option 2.

With respect to the comment: "*The NCC views the 100 year peak flow attenuation and enhanced 80% total suspended solids (TSS) as the appropriate quantity and quality benchmarks in all cases:"* DEC advised that it appears feasible to achieve close to 80% TSS removal (per the 2015 JFSA Feasibility Study) but this will ultimately be governed by the available footprint, depth and maximum water level elevations, etc. For similar reasons, it has also been confirmed that the pond will not significantly reduce the 100 yr peak flow at the inlet to the creek enclosure south of Carling.

DM Malkin noted it will be important for the CIS study to be very clear about any proposed trade-offs and/or targets re: water quality and quantity.

With respect to the comment that "*A SWM retrofit that would provide an opportunity to remove the gabion baskets is viewed as positive,"* JM confirmed that this was in reference to the existing gabion baskets along the north bank of the creek downstream of the storm outlet under Baseline and that they be removed to the extent feasible (i.e., not in reference to the higher gabion basket retaining wall along the rear of commercial properties on Baseline, although, the geotechnical assessment completed for the pond feasibility study flagged signs of potential instability*).[Post-meeting note: the proposed pond location does not require changes to/should not impact the gabion wall along the rear of Baseline properties. Recommendations from the geotechnical assessment have been forwarded to Asset Management Branch.]*

With respect to the comment: "*The NCC would need to have a commitment from the City that it will proceed with implementation of SWM retrofit measures beyond ''end-of-pipe'' that will include retrofits in the right-of-way and at the lot level or conveyance methods of SW controls througoht the entire watershed and not only on federal lands (as identified in the Pinecrest Creek/Westboro SWM Retrofit Study). The NCC would need to see concrete examples of implementation of the objectives of the Pinecrest Creek/Westboro SWM Retrofit Study will be realized:"* DEC asked for clarification regarding what would be required to demonstrate this commitment from the City. JM indicated NCC would expect that some retrofit works (lot level/conveyance)would proceed in advance of or concurrently with the proposed Baseline/Woodroffe pond.

DEC advised that the City has been working on identifying a number of lot level and conveyance retrofit candidates (on City properties/ROWs) to proceed in the near future. A final report will be available by the end of January 2016 and this information along with projected implementation dates will be forwarded to NCC shortly thereafter.

*Meeting notes prepared by Darlene Conway, P. Eng.*

# MINUTES

MORRISON HERSHFIELD

**Baseline/Woodroffe Retrofit Pond Class EA**
**NCC Meeting**

| | | |
|---|---|---|
| **Project:** | **City of Ottawa Pinecrest Creek CIS and Baseline/Woodroffe SWM Pond Class EA**<br>*Review of Comments and Questions from NCC Internal Design Review Committee* | |
| **Place:** | 180 Elgin, Trillium Boardroom, Ste. 601 | |
| **Date:** | June 28, 2016 | |
| **Time:** | 2pm-4pm | |
| **Present:** | Martin Barakengera (MB) | NCC |
| | Juan Galindez (JG) | NCC |
| | Julie Mulligan (JM) | NCC |
| | Binitha Chakraburtty (BC) | NCC |
| | Juan Galindez (JG) | NCC |
| | Darlene Conway (DC) | City of Ottawa |
| | Heather Wilson (HW) | JFSA |
| | Colin Brennan (CB) | JFSA |
| | Jim Clark (JC) | Thakar & Associates |
| | Sid Thakar (ST) | Thakar & Associates |
| | Charles Wheeler (CW) | CTP2 - Stage 2 LRT |
| | Elie Dagher (ED) | CTP2 - Stage 2 LRT |
| | Marc Magierowicz (MM) | CTP2 - Stage 2 LRT |
| | Karyn Cornfield (KC) | MH – PM (CIS & EA) |
| | Kelly Roberts (KR) | MH – EA Lead |
| **Acronyms** | CTP2 – Capital Transit Partners (Stage 2)<br>EA – Environmental Assessment<br>JFSA – J.F. Sabourin and Associates<br>MOECC – Ministry of Environment and Climate Change<br>MHL – Morrison Hershfield Limited<br>NCC – National Capital Commission | |

***Purpose:***

*The purpose of this meeting was to review comments and questions provided by the NCC Internal Design Review Committee (March 19, 2016) and to confirm the functional design for the proposed retrofit stormwater management pond at the northeast corner of Baseline and Woodroffe within the Pinecrest Creek corridor.*

## Agenda

| | | |
|---|---|---|
| Welcome/Introductions<br>Background | Darlene Conway, City of Ottawa | 10 min |
| Status of Pond Class EA | Kelly Roberts, Morrison Hershfield | 10 min |
| Status of Pinecrest Creek CIS | Karyn Cornfield, Morrison Hershfield | 10 min |
| NCC Design Review Committee<br>- Comments & Questions | All | 90 min |
| Next Steps | Karyn Cornfield/Darlene Conway | 10 min |

**Attachments:**

**Presentation Materials -** The PowerPoint slides presented during this meeting are attached.

**Response to NCC Design Review -** Responses to comments and questions from the NCC internal design review committee (March 9, 2016) were updated based on discussions during the meeting. The updated responses are attached.

**Email from Martin Barakengera, Dec. 6, 2016** - Regarding the potential sediment disposal site north of Iris.

**Summary of Discussion:**

- NCC suggested that the City might use the NCC land immediately north of Iris as a potential sediment disposal site. It was agreed that the feasibility of accessing and storing sediment on that site will be evaluated and compared to the alternative of trucking the sediment off-site during detailed design. A landscape concept sketch will be required.

*Post-meeting note: Sediment removal will be addressed more specifically prior to the first sediment removal cycle. Potential options will be included in the Class EA documentation.*

- NCC requires post-construction monitoring of non-performance-based physical aspects (e.g., inlet/outlet pipes, peninsula, in-stream grade control riffle, plantings/landscaping, etc.)

to ensure continued functioning of the facility as designed. A monitoring plan will be developed in consultation with the NCC during detailed design.

- The safety of the peninsula will be addressed during detailed design though grading of side slopes, signage, and deterrent plantings along the pond.

- NCC requires minimal signage for this site

- NCC expressed concern regarding the potential increase of mosquitoes due to open water. The City responded that the pond size and design should preclude this (large drainage area providing continuous flow, surface disturbance from wind, natural predation of larva, etc.). Ponds are also monitored regularly for mosquitoes by the City and actions taken (larvicide) if required.

- NCC asked about implications of bundling the project with Stage 2 OLRT and expressed concerns regarding quality control during detailed design. NCC requested that the design be guaranteed before releasing it to open market.

- Martin Barakengera will replace David Malkin on this file.

*Post-meeting note: The landscape concept was originally intended to be refined and reviewed with NCC during the Class EA however refinements to the landscape concept will not be required to satisfy the EA nor were any requests received from NCC to date to complete further refinements at this stage. The detailed landscaping plan will be completed with detailed design of the pond and vetted through NCC at that time.*

*Post-meeting note: Communication from NCC (attached email from Martin Barakengera, Dec. 6, 2016) provided further direction regarding the potential sediment disposal site north of Iris.*

*City of Ottawa*

# Pinecrest Creek Cumulative Impacts Study

# Baseline/Woodroffe SWM Pond Municipal Class EA

*Responses to Comments & Questions NCC Internal Design Review Comm*
*(March 19, 2016) Baseline/Woodroffe SWM Retrofit Pond*

*June 28, 2016*

THAKAR ASSOCIATES
DESIGN CONSULTANTS
Landscape Architecture
Environmental Planning
Urban Design

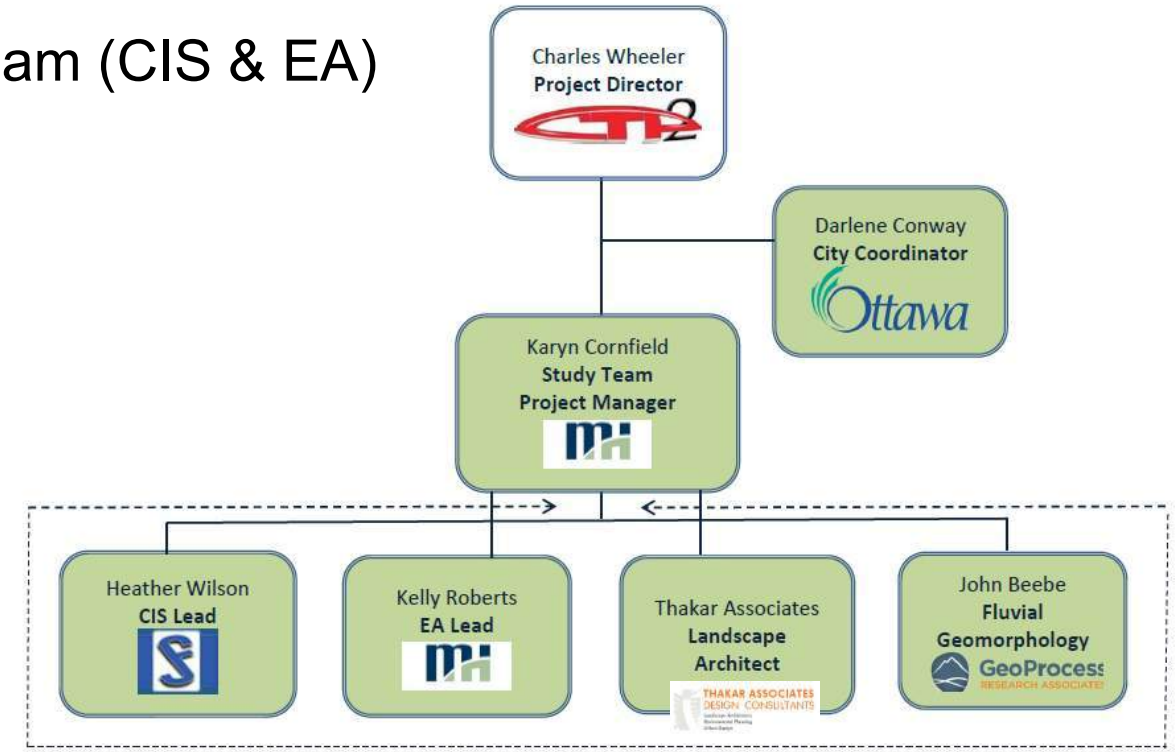
MORRISON HERSHFIELD

# Agenda

- Welcome/Introductions/Background
- Status of Baseline/Woodroffe Pond EA & Pinecrest Creek CIS
- Responses to Comments & Questions from the *NCC Internal Design Review Committee (March 19, 2016)*
- Next Steps

# Introductions

- Project Team (CIS & EA)



# Purpose of Meeting

- Review comments and questions provided by *NCC Internal Design Review Committee (March 9, 2016)* regarding the proposed City of Ottawa retrofit SWM pond at Baseline/Woodroffe in Pinecrest Creek corridor
- Responses provided by Class EA team (*Morrison Hershfield, Thakar Associates and JFSA)* with contributions from City of Ottawa staff
- Intent is to clarify concerns from NCC and to confirm how these concerns will be addressed to the satisfaction of NCC and documented in Class EA
- Landscape concept will be refined and reviewed with NCC prior to completion of Class EA
- No significant changes to the functional design are anticipated

# Project Overview

- Class EA: Baseline Woodroffe SWM Retrofit Pond
  - Conceptual design completed by JFSA in 2015 - to be confirmed through this study
  - Provincial Class EA requirements will be addressed herein - and to the extent possible the federal EA requirements (to inform detailed design)

- CIS: Pinecrest Creek Cumulative Impacts Study
  - To identify cumulative impacts on Pinecrest Creek due to future projects including the proposed SWM Pond, LRT and future development; and also effects of proposed SWM retrofits (lot level/ conveyance) over the next 20 years +/-
  - To identify appropriate measures to mitigate any cumulative (negative) impacts
  - CIS will also inform the Preliminary Engineering for LRT

# Project Status

- Pond EA
  - NOC posted by City (May 25)
  - Interim Report (Existing Conditions) submitted to City (June 1)
  - Building on previous reports/studies
  - Options evaluation TBD
  - Landscape concept plan to be refined given NCC input

- Creek CIS
  - Existing conditions update:
    - hydrologic/hydraulic model completed by JF Sabourin
    - water quality model completed by JF Sabourin
  - Fluvial geomorphology in progress (John Beebe)
  - Future conditions model – TBD (pending inputs from LRT)

# Schedule

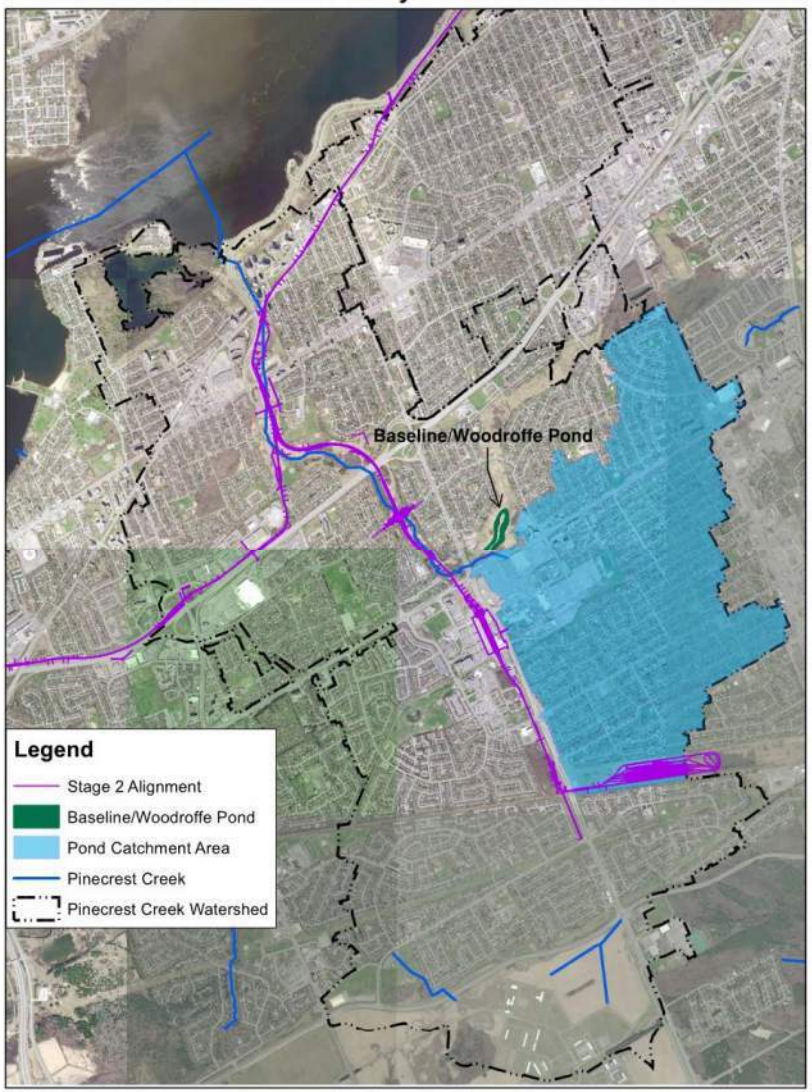
- Pond Class EA
  - *NCC pond design review meeting – June 28, 2016*
  - Landscape refinement – summer 2016
  - On-line open house – September 2016
  - Draft & final reports – fall 2016

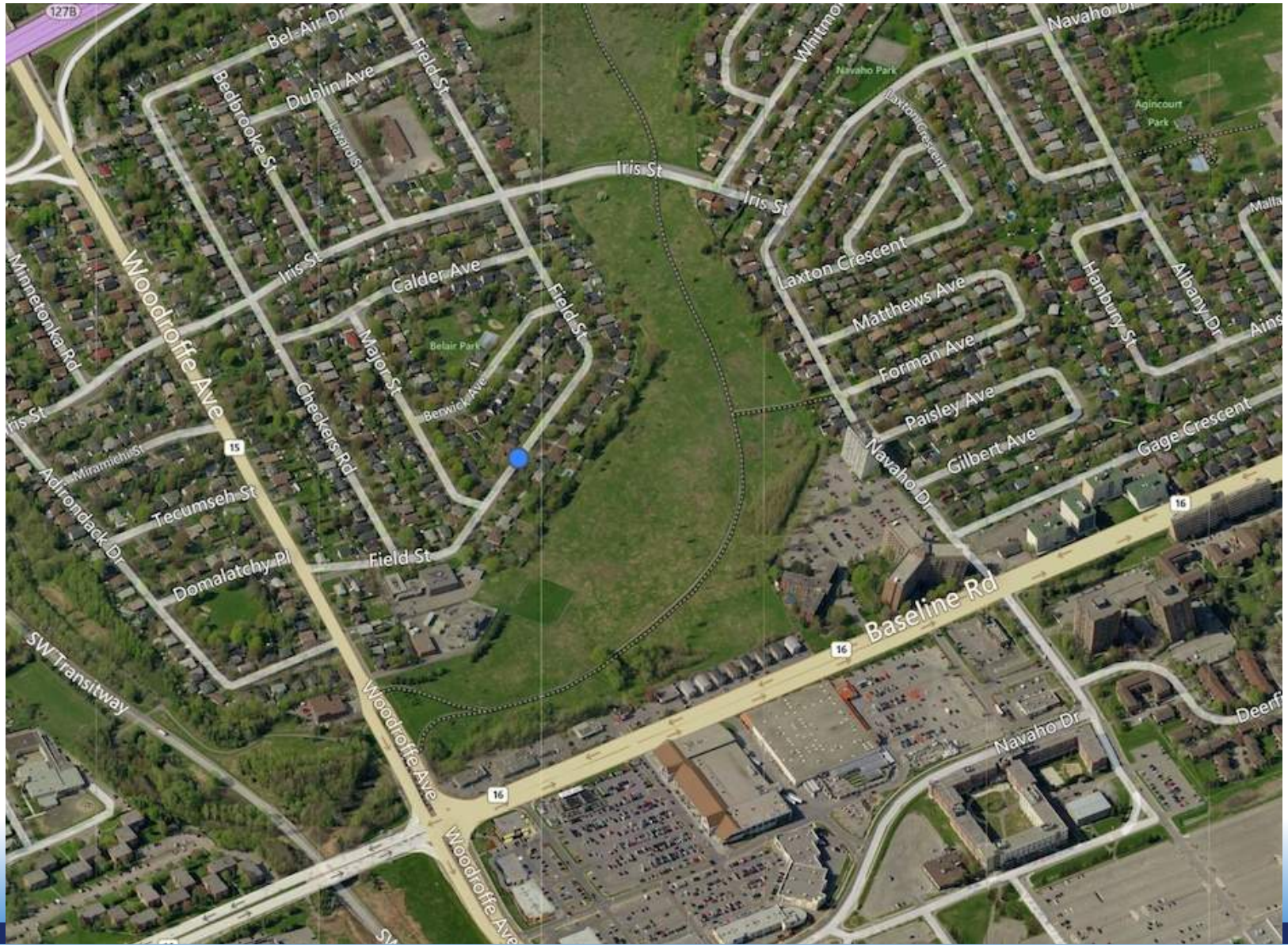
- CIS
  - Inputs from LRT preliminary engineering - finish date July 29, 2016
  - Future conditions modelling/impacts assessment/mitigation step – summer/fall
  - CIS reports will be completed by early 2017

Comments and Questions from *NCC Internal Design Review Committee (March 19, 2016)*

Responses from Pond EA Team (Morrison Hershfield, Thakar Associates, JFSA) with contributions from City of Ottawa staff

## Baseline/Woodroffe SWM Facility within Pinecrest Creek Watershed




127B
Bel-Air Dr
Bedbrooke St
Dublin Ave
Field St
Iris St
Navaho Park
Agincourt Park
Laxton Crescent
Matthews Ave
Forman Ave
Paisley Ave
Gilbert Ave
Gage Crescent
Hanbury St
Albany Dr
Navaho Dr
Minnetonka Rd
Woodroffe Ave
Calder Ave
Belair Park
Major St
Berwick Ave
Checkers Rd
Miramichi St
Adirondack Dr
Tecumseh St
Domalatchy Pl
Baseline Rd
SW Transitway
15
16

**1. The end result was that the committee agreed that Option 1 is the preferred NCC option for a proposed SWM pond on NCC lands for the following reasons:**

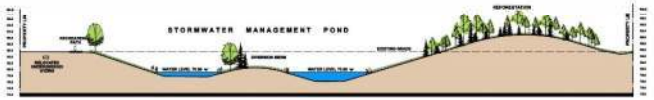
- **Option 1 is more natural.**
- **Option 2 is too finicky in design. The buried hydro cable should not drive the design or the choice of option.**
- **Option 1 does not result in a divided pathway alignment and would require less pathway maintenance.**
- **Option 1 is a better resolved design.**
- **Option 1 provides a longer length for water quality settlement.**

- Performance of both similar
  - Sizing
  - Achieve close to 80% TSS removal
  - Flood attenuation

- NCC preference for Option 1 was also confirmed at TAC 1 (Feb 25)

# Pond Option 1


SECTION A




SECTION B

LEGEND

PROPOSED
- STORMWATER RETENTION POND
- MEADOW
- MOWN GRASS
- REFORESTATION PLANTING
- LARGE TREE PLANTING
- SHRUB PLANTING
- 3m ASPHALT RECREATIONAL PATH
- CONTOURS (1.0m INTERVALS)
- 50m DRAW DOWN LIMIT

EXISTING
- CONTOURS (.5m INTERVALS)
- HYDRO POLE / LINE
- VEGETATION TO REMAIN

POND FEATURES / COMPONENTS
- A POND INLET
- B RIFFLE OVERFLOW 79.61
- C FLOW DIVERSION BERM
- D FOREBAY
- E FOREBAY OUTLET BERM
- F QUANTITY OUTLET
- G QUALITY LOW FLOW OUTLET
- H MAINTENANCE ACCESS ROAD
- I PINECREST CREEK


THAKAR ASSOCIATES
DESIGN CONSULTANTS
Landscape Architecture
Environmental Planning

# Pond Option 2


THAKAR ASSOCIATES
DESIGN CONSULTANTS
Landscape Architecture
Environmental Planning

**2. More thinking regarding the recreational opportunities around the SWM pond was encouraged. A suggestion was made to add a second bridge at the end of the peninsula to ensure pedestrians could exit at either end. As part of this reflection, Interpretative & Educational opportunities as well as any necessary wayfinding should be explored at the detailed design stage. The NCC expects a high quality landscape design for the pond area based on natural design principles, preferably using native species.**

## Recreational Opportunities

- nature-oriented, low-impact and unstructured recreation
- pathway system and some of the pockets of open space
- interpretive signage related to watershed and plants and wildlife

THAKAR ASSOCIATES
DESIGN CONSULTANTS
Landscape Architecture
Environmental Planning

Pathway looking east

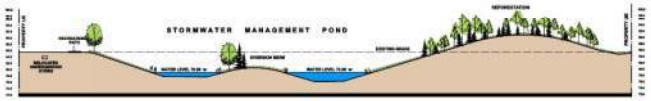
MORRISON HERSHFIELD


Authorized vehicles only
Reservé aux véhicules autorisés
EXPERIMENTAL FARM
FERME EXPERIMENTALE
minimum
100

## High Quality Landscape Design

- Plantings will support and enhance SWM function; functional; self-sustaining
- Native plantings; seasonal colour; key viewlines
- Planting zone guidelines will be applied on water levels as per the City of Ottawa Stormwater Pond Design Guidelines (Figure 8.1).


SECTION A




SECTION B

## LEGEND

**PROPOSED**

- STORMWATER RETENTION POND
- MEADOW
- MOWN GRASS
- REFORESTATION PLANTING
- LARGE TREE PLANTING
- SHRUB PLANTING
- 3m ASPHALT RECREATIONAL PATH
- CONTOURS (1.0m INTERVALS)
- 50m DRAW DOWN LIMIT

**EXISTING**

- CONTOURS (.5m INTERVALS)
- HYDRO POLE / LINE
- VEGETATION TO REMAIN

**POND FEATURES / COMPONENTS**

- A POND INLET
- B RIFFLE OVERFLOW 79.61
- C FLOW DIVERSION BERM
- D FOREBAY
- E FOREBAY OUTLET BERM
- F QUANTITY OUTLET
- G QUALITY LOW FLOW OUTLET
- H MAINTENANCE ACCESS ROAD
- I PINECREST CREEK


Ottawa

City of Ottawa, Infrastructure Services Department, Design & Construction (Municipal) West Branch

SCALE 1 : 1250

0 10 50 100m

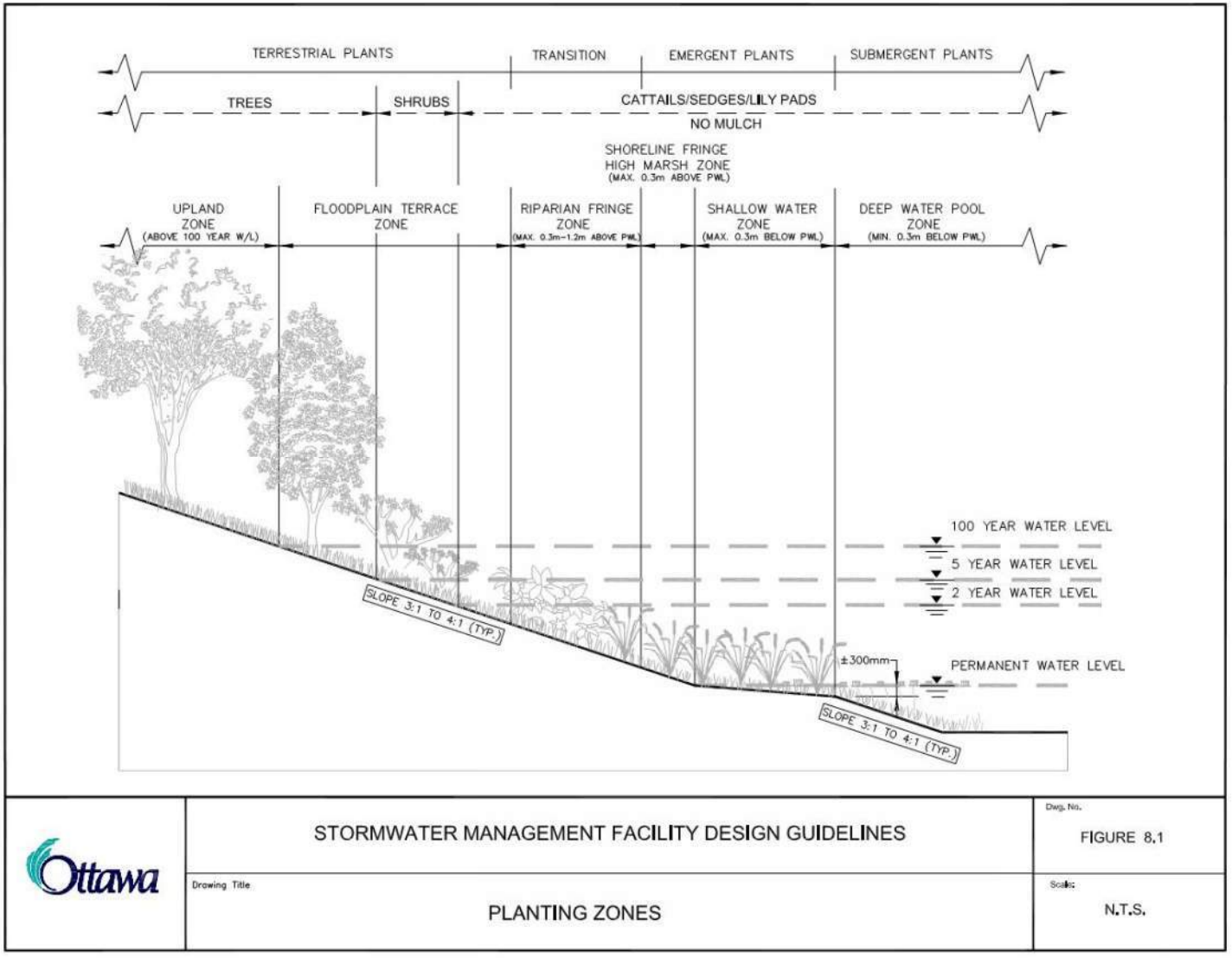
JFSA

JTB Environmental Systems Inc.

PINECREST CREEK STORM WATER MANAGEMENT POND FEASIBILITY STUDY

LANDSCAPE CONCEPT

**OPTION 1**

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Ottawa

STORMWATER MANAGEMENT FACILITY DESIGN GUIDELINES

Dwg. No.
FIGURE 8.1

Drawing Title
PLANTING ZONES

Scale:
N.T.S.

# Maravista Pond

Photos courtesy of Thakar Associates

THAKAR ASSOCIATES
DESIGN CONSULTANTS
Landscape Architecture
Environmental Planning

MORRISON HERSHFIELD

Wayfinding and Signage:

- The City's protocols for signage around SWM ponds will govern the selection, placement and content of signs, while the NCC's wayfinding and signage protocols will govern the Experimental Farm Pathway signage placement.
- Overall site programming and required signage needs to be confirmed with the City as it relates to the larger scale network (National Capital Pathway System).
- 3 types: information, safety & regulatory, and interpretive

23.62 in

35.43 in

Ottawa

# Stormwater Facility

## CAUTION

Potential drowning hazard. Water depth varies.
No swimming, fishing or vehicles, including

Pond water is unsafe for drinking.
Ice thickness unstable in winter.
PLEASE KEEP OFF.

# Installation de traitement des eaux pluviales

## MISE EN GARDE

Risque de noyade. La profondeur de l'eau varie.
Baignade, pêche et véhicules
(y compris VTT et motoneiges) interdits.
Eau stagnante impropre à la consommation.
L'épaisseur de la glace varie en hiver.
NE PASSEZ PAS SUR LA GLACE.

3-1-1

ottawa.ca

33"

18"

Ottawa

Please Don't Feed the Birds

Veuillez ne pas nourrir les oiseaux

**3. The safety of the dead end peninsula, especially during inundation, needs to be addressed. Perhaps a pedestrian bridge connection at the end would provide added security.**

- Peninsula is an important operations feature and is not intended to be a public pathway; it is proposed to explicitly discourage the public from accessing this area for safety reasons
- Limited capacity to accept additional load from pedestrian bridge due to firm silty clay deposit on the site without undergoing significant settlement (Golder 2015)


  - Continued on next slide

- Conceptual design of the pond includes 7h:1v side slopes for a distance of 3 m on either side of the permanent pool level and slopes of 3h:1v elsewhere; provides a relatively flat area near permanent water level from a safety perspective

- Signage to discourage access (shown previously)

**4. It is very important to assess the impact of maintenance requirements, particularly the proposed sediment drying area estimated to consist of the equivalent of 23 dump truck loads per year. Where will the sediment be taken?**

- accumulated sediment depth monitored by City
- forebay cleanout required once every 10 years (and 20-50 years entire pond)
- pond cleanouts during winter when ground is frozen
- where space permits, excavated sediment is typically allowed to dry on site (permanently); drying area is then graded and re-seeded
- in other cases, excavated sediments are disposed of off-site (landfill)
- *Note: Executive Summary should read 29 dump truck loads per year (not 23)*

CAT

**5. There are concerns about the maintenance of the low flow outlet in both options.**

- low flow/water quality outlet will consist of a 315 mm diameter orifice (this is well within the minimum MOE guideline - 100mm)
- granular base over inlet/outlet pipes will support impact of any maintenance vehicles
- City inspections for blockage after major rainfall

**6. There will very likely be a significant requirement for post construction monitoring of this facility with reporting at 1, 5 and 8 year intervals.**

- Monitoring requirements will be accompanied with future ECA (Environmental Compliance Approval) from MOECC

- Scope of additional requirements will be confirmed with NCC during detailed design

## 7. What is the potential for improved aquatic habitat?

- SWM pond will contribute to overall improved water quality downstream and provide some attenuation of peak flows; will increase the potential for healthier aquatic habitat in the creek

- not intended to provide aquatic habitat within the pond itself

## 8. How often do the greater than 25mm events occur?

- 5 exceedances per year would be expected

**9. Will there be fencing? If so it should neither create a barrier to movement nor be a negative visual intrusion in the landscape.**

- Fencing is not typically installed around SWM ponds.

- Pond grading (side sloping) will be inherently safe (max 3:1 plus terracing) so that if someone slips and falls in he/she can easily climb out.

School fencing (existing)

## 10. Will the pond create a mosquito problem or any public health concerns such as the West Nile virus?

- not typically a problem in SWM ponds in the City
- sufficient water movement (due to wind and flowing water / baseflows)
- natural predators (frogs and dragonflies)
- monitored by City – problems mitigated with larvacide spray

# Next Steps

| Milestone | Timing | SWM Pond EA | Pinecrest Creek CIS |
|---|---|---|---|
| TAC 1 | Feb 25 | Introduce EA, confirm pond footprint | Introduce CIS, confirm major projects |
| CIS Tech Memos to City | March – present | | Modelling results (Existing Conditions) |
| Interim EA Report | May | Phase 1 & 2 (Existing Conditions) | |
| **NCC Pond Design Meeting** | **June 28, 2016** | **Comments from *NCC Internal Design Review*** | |
| **TAC 2** | **early fall** | **Updated landscape concept. Interim EA work** | **Future condition results Confirm Interim Scenario** |
| CIS Tech Memo to City | Early fall | | Future Conditions |
| **Online Open House** | **Early fall** | **EA project and pond design** | |
| CIS Tech Memo to City | Early-late fall | | Interim Scenario & Cumulative Impacts |
| **TAC 3** | **late fall** | **Draft EA report** | **Interim Scenarios/Impacts Assessment (provisional: mitigation)** |
| EA Reports | Late fall | | |
| CIS Reports | Early 2017 | | |

# Next Steps

- Pond:
  - Refinement of landscape plan
  - Presentation of landscape plan and on-line open house materials to TAC

Questions or Comments?

# MEMORANDUM

MORRISON HERSHFIELD

| | | | |
|---|---|---|---|
| TO: | Darlene Conway, P. Eng. | ACTION BY: | |
| FROM: | Karyn Cornfield, P. Eng. | FOR INFO OF: | |
| RE: | Baseline/Woodroffe Pond Class EA | DATE: | April 6, 2017 |

This memo contains the comments and questions from the *NCC Internal Design Review Committee* (March 9, 2016) regarding the proposed City of Ottawa Baseline/Woodroffe retrofit SWM pond. Responses to these comments and questions are provided from the Class EA team (*Morrison Hershfield Ltd, Thakar Associates, and JF Sabourin and Associates Inc.)* with contributions from City of Ottawa staff. *Responses have been updated based on feedback from the NCC during a meeting on June 28, 2016.*

At this stage the intent is to clarify any concerns from the NCC and to confirm how these concerns will be addressed to the satisfaction of NCC and documented in the Class EA.

No significant revisions to the current functional design are anticipated at this stage. The detailed landscape plan will be undertaken and reviewed with NCC during detailed design.

NCC comments and questions are shown in **bold** below. Responses are shown below each comment.

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**1. The end result was that the committee agreed that Option 1 is the preferred NCC option for a proposed SWM pond on NCC lands for the following reasons:**

- **Option 1 is more natural.**
- **Option 2 is too finicky in design. The buried hydro cable should not drive the design or the choice of option.**
- **Option 1 does not result in a divided pathway alignment and would require less pathway maintenance.**
- **Option 1 is a better resolved design.**
- **Option 1 provides a longer length for water quality settlement.**

No response required.

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**2. More thinking regarding the recreational opportunities around the SWM pond was encouraged. A suggestion was made to add a second bridge at the end of the peninsula to ensure pedestrians could exit at either end. As part of this reflection, Interpretative & Educational opportunities as well as any necessary wayfinding should be explored at the detailed design stage. The NCC expects a high quality landscape design for the pond area based on natural design principles, preferably using native species.**

Recreational Opportunities: Various opportunities for nature-oriented, low-impact and unstructured recreation are possible around the SWM Pond. Recreation activities will revolve around the pathway system and some of the pockets of open space that will be created as a result of the landforming and reforestation.

In this respect, opportunities for activities such as fitness loops, power walking, cross country skiing, snowshoeing, birdwatching, etc., could be explored when designing the pathway system. Interpretive signage and display panels that provide an illustrative overview of the watershed and the place of Pinecrest Creek within it, its natural functions and the rationale for the SWM Pond project, as well as related matters (such as the role of plants and wildlife) that can enhance the public's knowledge of their urban infrastructure can be integrated into the pathway system both in the vicinity of the pond and at key locations within the corridor. Refer to item 3 regarding additional bridge opportunities.

High Quality Landscape Design: In general, the landscape of the SWM Pond corridor will be designed to support and enhance the function of the pond, and create a functional, self-sustaining greenspace that is embraced by the community as a major environmental asset and open space amenity. Key features of the SWM Pond landscape design would include the use of predominantly native plantings of trees, shrubs, perennials, grasses and groundcovers with the emphasis on seasonal colour and interest, as well as to attract birdlife and provide habitat. These plantings would be designed to shape the visual experience and define different zones of the site as the user moved through the landscape, whether on foot or on bicycle. For example groups of trees could be used to frame long views across the water, or masses of shrubs with colourful branching, foliage or flowers could be used to draw the eye along key viewlines, or a shady grove of trees organized to create an enclosure could create an inviting picnic area. Organizing these landscape elements in 'organic' layouts and groupings that reflect natural patterns would enhance the spaces and volumes created by the new landforms and water surface that anchor the SWM Pond open space.

Where possible native plants obtained from local nurseries will be sourced and specified in the planting plans. All plants will be selected for local hardiness and low maintenance characteristics, grouped in beds that facilitate unhampered grass maintenance operations by standard gang reel equipment. Along the side slopes shrub groupings will be strategically placed to minimize gully erosion, and appropriate screen planting using shrubs and perennials will be used to screen to the extent possible the storm inlets/outlets. In general, to reduce maintenance, the extent of grass areas will be reduced and replaced by extensive beds of low maintenance 'meadows' of native perennials. These perennial beds provide optimal growing conditions for trees so most tree groupings will be placed within these meadows. Landscape plantings on berm side slopes will be selected both in terms of their slope stabilization properties but also to withstand the dry conditions that are common on these slopes. The berms themselves will have a minimum 200mm thickness of topsoil that will support grass growth, and hardy, low-maintenance varieties of grasses/seed mixtures will be selected in consultation with the City's Surface Operations and Forestry staff to ensure long-term viability.

Planting zone guidelines will be applied to account for varying frequencies of inundation as per Figure 8.1 in the City of Ottawa Stormwater Pond Design Guidelines.

Wayfinding and Signage: The City's protocols for signage around SWM ponds will govern the selection, placement and content of signs, while the NCC's wayfinding and signage protocols will govern the Experimental Farm Pathway signage placement.

There are three main components to the wayfinding system: information signage, safety and regulatory signage, and interpretive signage. Information signage can identify the main site components such as the pond and pathway system, entry points, dog-walking areas, picnic areas, etc. Safety and regulatory signage could focus on restrictions to access, high water levels, and hazard areas; Stoop & Scoop signage, "please do not feed the birds" signage, etc. Interpretive signage can consist of illustrative display panels communicating interpretive and educational information about the SWM pond in the

context of the creek and efforts to improve its health. A master wayfinding layout for the site, combined with a schedule of required signage in the three categories could be prepared as part of the overall site design.

*Overall site programming and required signage needs to be confirmed with the City and NCC as it relates to the larger scale network (National Capital Pathway System). Minimal wayfinding signage requirements are anticipated by NCC.*

**3. The safety of the dead end peninsula, especially during inundation, needs to be addressed. Perhaps a pedestrian bridge connection at the end would provide added security.**

The peninsula is an essential design feature of Option 1. Its function is to preclude the "short-circuiting" of inflows and provide the desired flow length/retention time needed for water quality improvements. The crest of the peninsula has been set to match the peak simulated water level from the 25mm design storm (79.75m). For larger events (in the order of 25mm or greater), the peninsula will be submerged. For the 100yr event, the resulting pond elevation of 80.15m would result in 0.4m depth of water over the peninsula.

While an important design feature, the peninsula is not intended to be a pathway and it is proposed to explicitly discourage the public from accessing this area.

From a safety perspective, the current design of the pond includes 7h:1v side slopes for a distance of 3m on either side of the permanent pool level and slopes of 3h:1v elsewhere. This relatively flat area near the permanent water level will allow anyone who did fall in to readily climb out.

The following is a list of further potential design features to address safety concerns associated with the peninsula:

- "unfriendly" plantings near pond edge and along top of peninsula to discourage access
- signage to discourage public access (saying "This area is subject to periodic inundation and flooding during major rain events. Access at your own risk.")
- raising the peninsula or ramping/grading the peninsula such that the tip is lowest and floods first and the bottom end floods last (both options subject to geotechnical investigation and both will result in some loss of active and wet storage volume)

The suggested pedestrian bridge is problematic for the following reasons:

- a bridge at the end of the peninsula would send the "wrong" message by encouraging access
- preliminary geotechnical information suggests it may be challenging to install a bridge in this location due to the potential for significant settlement: From the Pond Feasibility Study, Appendix I p2 *"There is limited capacity to accept additional load from pedestrian bridges due to firm silty clay deposit on the site without undergoing significant settlement. In the case of bridges, flatter pond side slopes would be required, which would result in a longer bridge and higher foundation loads."*

**4. It is very important to assess the impact of maintenance requirements, particularly the proposed sediment drying area estimated to consist of the equivalent of 23 dump truck loads per year. Where will the sediment be taken?**

Accumulated sediment depth will be monitored regularly by the City. Depending on sediment depths measures, forebay cleanout will be required on average about once every 10 years (larger facility cleanouts would be anticipated once every 20 to 50 years). Typically the cleanouts are completed during the winter when the ground is frozen. In cases where there is sufficient space within the pond block, excavated sediment remains on site permanently. The sediment stockpiled in the designated sediment storage area, is permitted to dry out and then graded and seeded. In other cases, excavated sediments are trucked off-site for disposal (typically landfill).

Maintenance vehicles require service roads either on both sides of the pond including the peninsula, or on one side of the pond with a ramp down into the pond, to clean out sediments from the bottom of pond by working from the side and within the reach of the excavator.

The approach to sediment removal will be confirmed prior to the first clean-out cycle (approximately 10 years from construction). The feasibility of accessing and disposing sediment on NCC land north of Iris will be evaluated and compared to the alternative of trucking the sediment off-site. Refer to NCC requirements for locating sediment storage north of Iris in e-mail dated December 6, 2016 from Martin Barakengera.

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**5. There are concerns about the maintenance of the low flow outlet in both options.**

The proposed low flow/water quality outlet will consist of a 315 mm diameter orifice (or equivalent), which is well above the minimum orifice size (100mm) recommended in the SWM Planning and Design Manual (MOE, 2003). This size of orifice is not atypical for existing SWM ponds throughout the City. Regular inspections of the facility will be undertaken following major storm events. This size of orifice is not anticipated to present any additional maintenance concerns with respect to blockage,

A maintenance access over the inlet/outlet pipes will be designed to support required maintenance vehicles. This will be addressed during detailed design.

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**6. There will very likely be a significant requirement for post construction monitoring of this facility with reporting at 1, 5 and 8 year intervals.**

It is anticipated that MOECC's future approval of the facility will identify monitoring requirements (via the required Environmental Compliance Approval). The City will advise NCC of those requirements when available. Monitoring of non-performance based physical aspects (e.g. inlet/outlet pipes, peninsula, in-stream grade control riffle, etc.) is required to ensure continued functioning of the facility as designed. A monitoring plan will be developed during detailed design for review/approval by NCC.

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**7. What is the potential for improved aquatic habitat?**

The SWM pond is one element of a long-term comprehensive watershed solution with the aim of mitigating the impacts of uncontrolled urban runoff on Pinecrest Creek. The SWM Pond will contribute to improved water quality downstream and provide some attenuation of frequent peak flows. In combination with other retrofits over time (e.g., lot level and conveyance measures), the resulting improvements (improved water quality and less “flashy” hydrology) will contribute to healthier aquatic habitat in the creek.

While the pond will be “naturalized" in appearance, it is not intended to provide aquatic habitat within the facility itself, given the need to regularly maintain the facility (e.g., periodic sediment removal).

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**8. How often do the greater than 25mm events occur?**

Based on rainfall statistics and the total volume (25 mm), just over 5 exceedances (events with volumes greater than 25 mm) per year would be expected (based on a 1:7 week return period and a 36 week rainfall season April 1 to Nov 30).

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**9. Will there be fencing? If so it should neither create a barrier to movement nor be a negative visual intrusion in the landscape.**

Fencing is not typically installed around SWM ponds. Pond grading (side sloping) needs to be inherently safe (max 3:1 plus terracing) so that if someone slips and falls in he/she can easily climb out.

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**10. Will the pond create a mosquito problem or any public health concerns such as the West Nile virus?**

In general, a healthy pond environment where there is sufficient water movement (due both to wind activity and flowing water/baseflows) should present poor habitat for mosquitoes and discourage seasonal algal blooms from becoming a problem. The use of pond plantings such as native lilies is an option to create shade to discourage algae growth. Once the pondside vegetation is established it will attract various species of wildlife such as frogs and dragonflies that will feed on mosquito larvae and algae. The use of native landscape plants that attract beneficial insects such as dragonflies that feed on mosquito larvae will be considered.

Trees will be protected during the first two or three years of establishment with rodent collars to prevent a surge in mouse populations over the winter months, but in general there is little likelihood of any single species of wildlife or plant overwhelming or dominating the landscape.

Mosquitoes are not typically a concern in SWM ponds for the reasons noted above. The City regularly inspects ponds. If mosquitoes do become a nuisance, then treatment with a larvicide is undertaken. Further, since 2006, the City has been working with the NCC, the Federal Public Works Department, and the Department of National Defence and agreed that Ottawa Public Health oversee the delivery of a West Nile Virus Control program on federal lands located within the City of Ottawa resulting in a cohesive West Nile Virus control program being conducted on municipal and federal lands.

## Karyn Cornfield

**From:** Barakengera, Martin <martin.barakengera@ncc-ccn.ca>
**Sent:** Tuesday, December 06, 2016 4:57 PM
**To:** Karyn Cornfield
**Cc:** Conway, Darlene; Bédard, Valérie; Chakraburtty, Bina; Muir, Michael; Fisher, Susan
**Subject:** RE: Potential Sediment Disposal Site - North of Iris

Hi Karyn,

We discussed the proposed sediment disposal site and concluded that it is a potential suitable location to assess further, subject to the following:

- City to demonstrate there will be no additional impact to soil and water quality
- City to provide NCC with final design characteristics of site
- City must be prepared to pay fair market value (as negotiated with NCC's Real Estate Transactions and Development division) for the necessary easement

Team members expressed concerns about a likely opposition to sediment disposal at the proposed site from residents north of Iris at the time of sediment disposal. To mitigate this risk, it was suggested that the City examine the possibility of modifying the design of the stormwater pond to create space for the sediment disposal site on the pond site. That would eliminate the potential perception by residents that the pond is creeping onto adjacent lands across the street. I understand that the idea of integrating the pond and the sediment disposal site was discussed earlier on but was abandoned for lack of NCC support. If that was the case at that time, our circumstances have evolved and we would now be prepared to support such facility integration.

If the same-site concept is not feasible, then NCC will need to be satisfied that the surrounding residential communities have been duly consulted and are not opposed to the proposed sediment disposal site across Iris Street.

Regards,

**Martin Barakengera** MCIP RPP PMP
Senior Land Use Planner - Planificateur principal, utilisation du sol
Capital Planning - Aménagement de la capitale
National Capital Commission - Commission de la capitale nationale
202 - 40 Elgin, Ottawa, ON CANADA, K1P 1C7
tel: 613-239-5678 ext. 5196
www.ncc-ccn.gc.ca

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**From:** Karyn Cornfield [mailto:KCornfield@morrisonhershfield.com]
**Sent:** Friday, December 02, 2016 3:05 PM
**To:** Barakengera, Martin
**Cc:** Conway, Darlene
**Subject:** RE: Potential Sediment Disposal Site - North of Iris

Hi Martin – Attached is a nicer figure showing the potential disposal site within the full extent of the property

---

**From:** Barakengera, Martin [mailto:martin.barakengera@ncc-ccn.ca]
**Sent:** Thursday, December 01, 2016 3:25 PM
**To:** Karyn Cornfield <KCornfield@morrisonhershfield.com>

**Cc:** Conway, Darlene <Darlene.Conway@ottawa.ca>
**Subject:** RE: Potential Sediment Disposal Site - North of Iris

Hello Karyn,

Thank you for your candid description of this takeaway question. We will discuss the matter at our regular weekly meeting on Tuesday December 6th. Following that meeting, I will confirm whether the location is worthy of further consideration.

Martin

**Martin Barakengera** MCIP RPP PMP
Senior Land Use Planner - Planificateur principal, utilisation du sol
Capital Planning - Aménagement de la capitale
National Capital Commission - Commission de la capitale nationale
202 - 40 Elgin, Ottawa, ON CANADA, K1P 1C7
tel: 613-239-5678 ext. 5196
www.ncc-ccn.gc.ca

---

**From:** Karyn Cornfield [mailto:KCornfield@morrisonhershfield.com]
**Sent:** Thursday, December 01, 2016 3:09 PM
**To:** Barakengera, Martin
**Cc:** Conway, Darlene
**Subject:** Potential Sediment Disposal Site - North of Iris
**Importance:** High

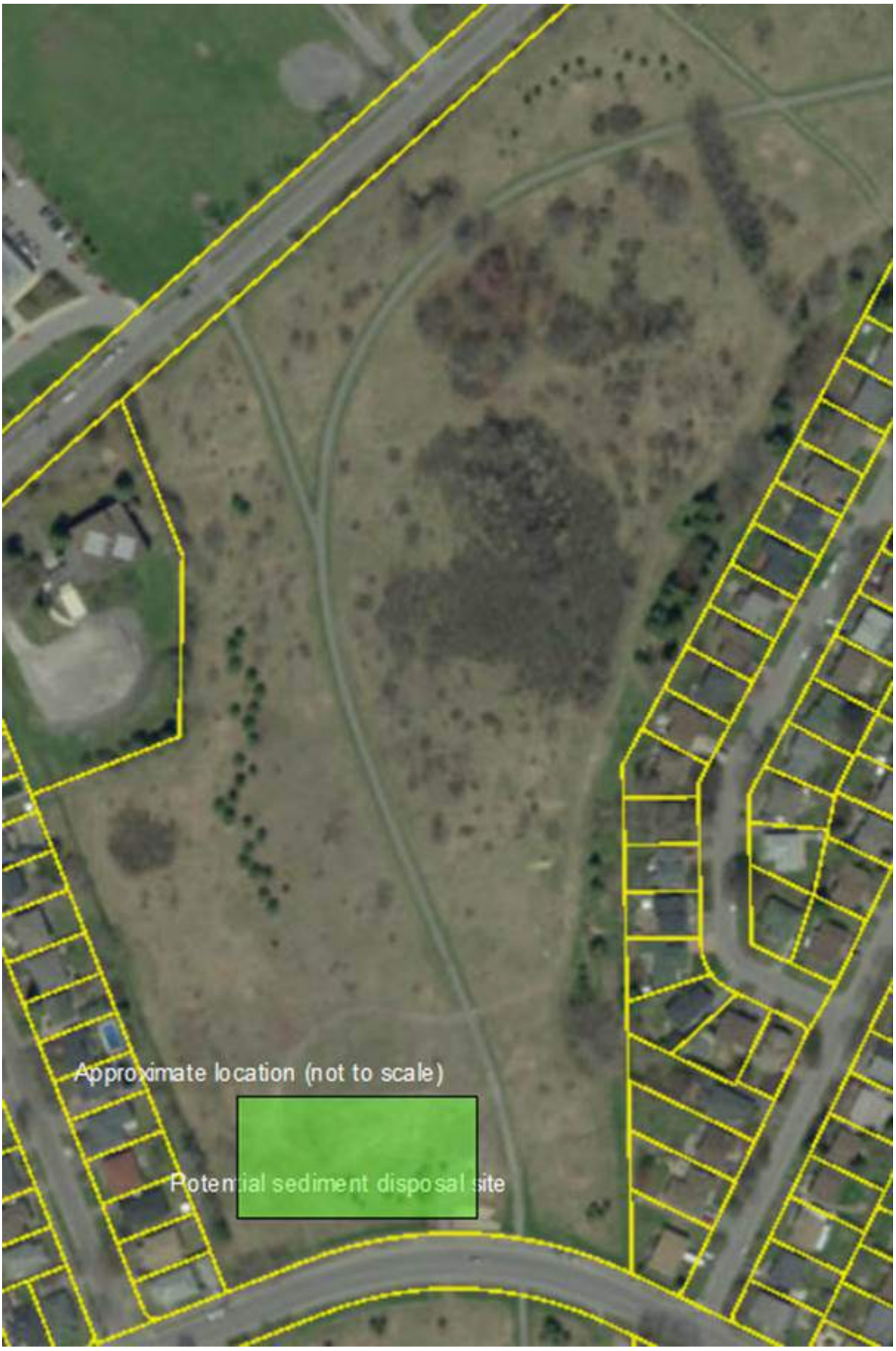
Good afternoon Martin,

When we met with NCC in June to discuss comments from the NCC design review regarding the Baseline/Woodroffe Stormwater Pond the NCC suggested using the lands north of Iris as a "potential sediment disposal site" and agreed that the feasibility of this location would be considered during the detailed design. The exact location of the disposal site on the property was not identified at the time. The property that extends all the way to Maitland (PIN 039890430) so I'd like to confirm a preferred location to direct a borehole investigation. Based on a desktop review the area I'd like to suggest the area *(shown below)* immediately north of Iris and west of the pathway as an ideal location for proximity to the pond, ease of access (small parking lot off Iris), and minimal number of trees relative to the remaining property. Is this a suitable location to assess in further detail?

Note: The aforementioned meeting was held June 28 at Stage 2 office and attended by yourself, Juan Galindez, Bina Chakraburtty, Christopher Meek, and Julie Mulligan.

Thank you,

**Karyn Cornfield, M.Sc.Eng., P.Eng.**
Stormwater Management and Drainage
Owner's Engineer Stage 2 LRT
Reception: 613 739-2910
Direct: 613 739 9886 ext. 10-222-03
Mobile: 613 884 5584
KCornfield@morrisonhershfield.com


Approximate location (not to scale)
Potential sediment disposal site

# Appendix B: Public Consultation Material

***Online Information Session***

- Notice of Online Information Session
  - Le Droit
    - *Published November 3, 2016*
    - *Published November 10, 2016*
  - Nepean-Barrhaven News
    - *Published November 3, 2016*
    - *Published November 10, 2016*
  - City of Ottawa Planning and Development e-newsletter
    - *Sent November 16, 2016*

***Public Meeting #1***

- Notice of Public Meeting
  - Le Droit
    - *Published December 15, 2016*
    - *Published January 5, 2017*
  - Nepean-Barrhaven News
    - *Published December 15, 2016*
    - *Published January 5, 2017*
  - City of Ottawa Planning and Development e-newsletter
    - December 19, 2016
  - Email from the City of Ottawa project manager to those on the email list
    - December 15, 2016
  - Direct mail-out to all properties abutting the site of the proposed pond
- Powerpoint Presentation (English and French)
- Project Information Bulletin (English and French)
- Display boards (Bilingual)
- As We Heard It Report (English and French)

***Questionnaire*** *(available during the online information session and at the public meeting)*

***Public Meeting #2***

- Notice of Public Meeting
  - Le Droit
    - *Published May 11, 2017*
  - Nepean-Barrhaven News
    - *Published May 11, 2017*
  - Email from the City of Ottawa project manager to those on the public and stakeholder email list

        - May 4, 2017
        - May 15, 2017
    - Direct mail-out flyer to all properties abutting the site of the proposed pond
    - Project Website and City of Ottawa public consultation website
- Powerpoint Presentation (English and French)
- Display Boards (Bilingual)

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3-1-1
ATS 613-580-2401

**Avis de séance d'information en ligne**
**Bassin de rétention des eaux pluviales à l'intersection Baseline/Woodroffe**
**Évaluation environnementale de portée générale et étude de conception fonctionnelle**
**Du 3 novembre 2016 au 21 novembre 2016**

**ottawa.ca/ bassinderetentionbaselinewoodroffe**

La Ville d'Ottawa a entrepris une évaluation environnementale de portée générale concernant l'aménagement d'un bassin de rétention des eaux pluviales à l'angle nord-est du chemin Baseline et de l'avenue Woodroffe. L'aménagement d'un tel bassin avait été initialement recommandé dans l'Étude de modernisation de la gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011) et avait fait l'objet d'une nouvelle évaluation dans le cadre de l'Étude de faisabilité pour l'installation de gestion des eaux pluviales de surface à l'angle du chemin Baseline et de l'avenue Woodroffe (2015).

Le bassin proposé assurera le traitement et la régulation des eaux de ruissellement provenant de quelque 435 hectares qui s'écoulent actuellement d'une manière incontrôlée vers le ruisseau Pinecrest.

L'étude d'aménagement du bassin, qui est effectuée en vertu de l'annexe B de l'évaluation environnementale municipale de portée générale, permettra de définir l'option et la conception fonctionnelle qui conviennent le mieux pour l'aménagement.

Nous vous invitons à une séance d'information en ligne dans le cadre de laquelle vous pourrez examiner et commenter les conditions actuelles et les options proposées pour le bassin. Consultez le site Web sur **ottawa.ca/ bassinderetentionbaselinewoodroffe** et remplir le questionnaire d'ici le 21 novembre 2016. L'équipe de l'étude examinera tous les commentaires reçus et répondra aux préoccupations et questions soulevées avant que le rapport d'évaluation environnementale de portée générale ne soit terminé.

Pour obtenir de plus amples renseignements ou faire ajouter votre nom à la liste d'envoi, veuillez communiquer avec :

Darlene Conway, P. Eng.
Gestionnaire principale de projet
Ville d'Ottawa
Tél. : 613-580-2424, poste 27611
Courriel : Darlene.Conway@ottawa.ca

Nº 2016-507-S_Baseline-Woodroffe Stormwater_03112016

# Centre of excellence would create 'huge business opportunity'

*Continued from page 42*

QNX driver-assist software can be found in more than 60 per cent of cars coming off production lines worldwide, said Barrie Kirk, a Kanata Lakes residents and autonomous vehicle consultant.

"It shows that we can as a city, as a province, sell technology products to the automobile sector worldwide," he said. "We want to raise the flag here."

Kirk is the founder of the Canadian Automated Vehicles Centre of Excellence and works with clients worldwide on understanding and establishing autonomous transportation.

Kirk said locating a centre of excellence in Ottawa would create "a huge business opportunity for local technology companies," estimating the global mobility market at about $10 trillion US.

"There's a lot of capability," he said. "The more we as a city focus on that, it will help the companies in the tech park and the broader Ottawa area to get into and get a good share of the global market."

> Self-driving cars are going to have a huge impact on the city of Ottawa.
>
> BARRIE KIRK
> FOUNDER OF THE CANADIAN AUTOMATED VEHICLES CENTRE OF EXCELLENCE

Kirk added that autonomous vehicles will change the future of transportation.

"Self-driving cars are going to have a huge impact on the city of Ottawa," he said. "If you look back 100 years ago, Model T Fords were coming off the production line. You know how they changed lives.

"Self-driving cars are going to change everything all over again – a huge impact. We have an opportunity to redesign the city of Ottawa."

Autonomous vehicles will also make roads safer, he said.

"Computers don't get tired or distracted or drunk or fall asleep," said Kirk. "My hope and my prayer is that we can save about 80 per cent of collisions, deaths and injuries on the road each year."

**City council approved a motion to research and submit a plan to the province to allow autonomous vehicle testing on public roads, beginning in the Kanata North Business Park.**

PHOTO ILLUSTRATION BY JESSICA CUNHA/METROLAND

# Ontario PC Party officials refuse to disclose vote breakdown

*Continued from page 23*

in the riding of Niagara West-Glanbrook – over Ontario PC Party president Rick Dykstra, as proof that the party doesn't meddle in the local nomination process.

But it would seem many aren't convinced.

"It's understandable that, as leader, Patrick Brown has full authority under the rules of the party to impose that decision unilaterally, and after the shocking upset in Niagara West-Glanbrook last week, he likely feels compelled to limit opposition to his favoured candidates," Tysick said in a statement sent to Metroland Media. "That said, if he cares at all about democracy, he should open the process to all and let people have their say."

Among the chief concerns addressed by several conservatives who spoke with Metroland Media were the size of the venue where the election of the riding executive was carried out in August and where the candidate nomination meeting will be held on Nov. 5. There was also little to no communication about key dates and application deadlines, insiders say.

It would seem the deck was stacked in favour of Ghamari, according to the picture former city councillor Doug Thompson painted of the founding meeting of the executive on Aug. 31 at the Alfred Taylor Centre in North Gower.

"There was no guideline for the meeting itself; there was no oversight," he said, adding people were lined up at Ghamari's table thinking it was the general registration table, and Ghamari's people were handing out papers bearing certain names for executive roles in the riding association.

"People were just copying her list right onto the ballot," Thompson said. "I think they hold better elections in Somalia."

On Ghamari's website, it says there was a strong showing at the founding meeting.

"In fact, we were successful and elected 100 (per cent) of the board members endorsed by Goldie and her team," her website reads.

Liz MacKinnon, the Carleton PC riding association president, said the executive has just been following party guidelines.

"The only role I had was to select the venue," she said.

Ghamari echoed the sentiment of the association, saying the party determines the rules, but didn't respond to multiple requests for comment about member concerns or Tysick's disqualification.

### NOT ENOUGH ROOM

The nomination of a PC candidate will be held at the Alfred Taylor Centre on Nov. 5, but many people expect problems because of the size of the room.

"There have been some concerns about the venue," said Purcell. "We held the founding meeting there with 350 members and it was at capacity."

According to a representative with the Alfred Taylor Centre, the space can hold between 250 and 400 people, depending on the type of event.

Purcell said the riding executive will have to find a way to compromise.

"Not allowing people to vote would be against the party's constitution," he said.

A notice sent to Conservatives by the PC constituency association of Carleton said party members must be in the building to register by 10 a.m. in order to be eligible to vote.

Purcell estimated 1,000 memberships had been sold up to a week before the nomination meeting.

It's estimated that 300 people cast a ballot.

Tysick said 818 memberships had been sold in total before he was disqualified. His team estimates confirmed support from 400 members. Those numbers have not been confirmed by the riding association.

Osgoode resident and conservative Rob Brewster won't be attending the meeting because of his concerns over the way the August event unfolded.

"I walked away," he said of the voting process for the association's executive. "In my mind it's not legit."

Brewster and another long-time conservative, David Presley, said that a barbecue stationed beside an RV outside of the centre was completely inappropriate.

"It didn't take me long to realize it was just Goldie's people," said Presley, a Manotick resident. "It was a founding meeting of a new riding association and I thought we were there to do an election, not to have a barbecue."

Presley said he's not sure if the barbecue breaks any rules, but added the optics are questionable.

"I would think of that as the same as having some kind of inducement at a poll," he said.

Brewster agreed, saying, "On election day, you're not even allowed to have one of your signs outside a polling station."

Conservative Bob Cook, who helped Thompson sell memberships during his campaign, said the candidates seeking an executive position weren't even introduced to the crowd.

"Mickey Mouse would have been proud," said Cook, who lives in Carsonby, just outside North Gower. "This was kids-in-the-playground type stuff."

Aside from the venue, several people expressed concern over the timing of the upcoming nomination meeting. Originally, the vote wasn't expected until spring 2017, but the date has been moved up a couple of times, insiders say.

Thompson said November isn't great timing since it's deer-hunting season.

Former longtime Ottawa CFRA radio host Nick Vandergragt has also weighed in.

"What's the rush?" Vandergragt said of the timing. "There are a lot more than 300 people in that riding that would have wanted to vote. And they only make room for 300? Something stinks in Denmark."

Vandergragt isn't a resident of the riding, but says he's a small "c" conservative and has been keeping an eye on the race. He hosts an online radio show broadcast from Greely.

Like Tysick, Vandergragt seems convinced the party's upper echelon is hand-picking candidates.

"I think these kinds of things that are going on under Patrick Brown are provincewide, not just in Carleton," he said, adding traditional conservatives are going to stay home on Nov. 5 and not cast a ballot.

Cook echoed the sentiment, saying the perceived behind-the-scenes meddling could cost the party the riding.

"Something like this is not good for the riding and not good for the people in it," he said.

Thompson went to so far as to say the Ontario PC party is putting the new riding on a platter for the Liberals.

"They're alienating a lot of people, not just in Carleton, in other areas," Thompson said. "If I was a Liberal in this area, I would be licking my chops, saying, 'This could be the one that we would be willing to put up a big fight to wrestle it from the PCs.'"

Presley and his wife Lyn are big supporters of the party and current MPP Lisa MacLeod – whose riding of Nepean-Carleton is being split due to population growth to form the new Nepean and Carleton ridings.

"Quite frankly, I would wonder if … it's a good idea for a party that can't even run a founding meeting properly, how are they ever going to run a government properly?" Presley said. "I would have to hold my nose to vote Conservative this time, and I hate not to. I would just not vote probably."

[redacted]

[redacted]

Planning and Development E-newsletter - November 2016

City of Ottawa <planning@ottawa.ca> Wed, Nov 16, 2016 at 9:06 AM

[redacted]

View in browser

# Planning and Development

## Announcing Registration for the Planning Primer Elective: Committee of Adjustment

November 19 and 21, 2016 (Offered in English)

Location:
City Hall, 110 Laurier Avenue West
Festival Control Room, First Floor
9 a.m. to noon

November 28, 2016 (Offered in French)

Location:
City Hall, 110 Laurier Avenue West
Richmond Room, Second Floor
9 a.m. to noon

You can register for the course online until November 18, 2016. Seating is limited to 40 residents per session.

The Planning, Infrastructure and Economic Development department offers the Planning Primer Program to help residents become more aware of, and more involved in, the land-use planning process. The program is a series of half-day courses. Please see our schedule for other Primer courses.

Please send your questions to primer@ottawa.ca

## Land Evaluation and Area Review (LEAR) Update

Public Meeting (at Planning Committee)
Tuesday, November 22, 2016
9:30 a.m. Champlain Room
Heritage Building, 2nd floor

Ottawa City Hall

The Ottawa-Carleton LEAR System, originally developed in 1997, is now updated to incorporate current soil and land use information. A number of the new LEAR factors have also been updated. The Ottawa Land Evaluation and Area Review for Agriculture (LEAR) report has two volumes:

• LEAR Volume 1 contains a description of the LEAR system and how properties are scored.

• LEAR Volume 2 contains LEAR data for each scored property.

Land owners may use the LEAR map to easily search for their property and see the new LEAR scoring or you can download a printable Map (PDF)

For more information, contact bruce.finlay@ottawa.ca

## R4 (Residential Fourth Density) Zoning Review

Ottawa continues to see urban intensification and a continued interest in urban living. Ottawa's intensification policies have largely been successful in directing and realizing changes within areas targeted for intensification such as within mixed use centres and along mainstreets.

However, established communities continue to face challenges in ensuring that change and intensification is compatible with the existing fabric and character. The R4 Zoning Review follows several recent zoning studies aimed at ensuring more compatible infill and intensification in established low-rise neighborhoods in the urban area.

Read our discussion paper. Please send us your comments and questions by Friday, December 16, 2016.

## Canada Day 2017 - Temporary Campgrounds at City Facilities

A zoning by-law amendment proposal is being considered by the Planning, Infrastructure and Economic Development Department at the City of Ottawa. The zoning amendment proposal affects certain lands throughout the City of Ottawa.

The proposed amendment will permit campgrounds at the following City-owned facilities, for a temporary period of six (6) days from June 29 to July 4 2017, in order to accommodate visitors to the city on and around Canada Day weekend 2017:

Urban Area Sites (to be considered by Planning Committee):

- Bob Macquarie Recreation Complex (1490 Youville Drive)
- Ray Friel Recreation Complex (1585 Tenth Line Road)
- Richelieu-Vanier Community Centre (300 Des Pères-Blancs Avenue)
- St. Laurent Recreation Complex (525 Coté Street)
- Nepean Sportsplex (1701 Woodroffe Avenue)
- Earl Armstrong Arena & Trillium Park (2020 Ogilvie Road)
- Kanata Leisure Centre (70 Aird Place)
- Jim Durrell Recreation Centre (1265 Walkley Road)
- Tom Brown Arena (141 Bayview Road)

Rural Area Sites (to be considered by Agriculture and Rural Affairs Committee)

- Cumberland Village Heritage Museum (2830 and 2940 Old Montreal Road)

For more information contact tim.moerman@ottawa.ca

## Density Index – Phase One Zoning Strategy Now Available

Changes have been made to the proposed Density Index zoning amendment to simplify how density rates are calculated and to introduce the new requirements in two Phases. Phase one is now available for review and comment.

The purpose of the Density Index project is to create minimum required densities for all lands, within the designated intensification areas of the Official Plan. These include:

•Central Area
•Arterial Mainstreets
•Town Centres
•Mixed-Use Centres

Need more information? contact elizabeth.desmarais@ottawa.ca

## Baseline and W oodroffe Stormwater Management Pond

You are invited to an online Information Session to review and comment on the existing conditions and pond alternatives. Visit ottawa.ca/baselinewoodroffepond and fill out the questionnaire by November 21, 2016.

The study team will review all comments and respond to any concerns or questions before the Class EA report is completed.

For more information, or if you wish to have your name added to the mailing list, please contact darlene.conway@ottawa.ca

## Register Now for a W ebinar on Sustainable Neighbourhood Development

Register now for the Federation of Canadian Municipalities free webinar sessions on November 24 and December 1 and learn how to get started with creating sustainable, livable neighbourhoods.

Participate in discussions with leading sustainability experts and municipal representatives who have successfully developed sustainable communities.

Session 1: English
Date: Thursday, November 24, 2016
Time: 2 – 3:30 p.m. EST

This session offers practical solutions to six common challenges of sustainable neighbourhood development from an expert in sustainable neighbourhood development and three innovative Ontario municipalities that successfully implemented sustainable neighbourhood plans.

Speakers:
Peter Whitelaw, Principal, Modus Planning, Design & Engagement Inc.
Adriana Gomez, Senior Project Manager, Sustainable Neighbourhoods, Toronto and Region Conservation Authority
Amy Burke, Senior Planner, Municipality of Clarington, ON
Graham Seaman, Director of Sustainability, City of Markham, ON

Session 2: French
Date: Thursday, December 1, 2016
Time: 2 – 3:30 p.m. EST

The session will present best practices for developing sustainable neighbourhoods, as well as details on a Quebec municipality that has put these practices into action.

Speakers:
David Paradis, Director, Research, Training and Coaching at Vivre en Ville
Michel Larue, Director, Sustainable Planning Department at City of Terrebonne, QC

## Get Involved at an Upcoming Event

November 21, 2016
Urban Forest Management Plan (UFMP): Phase 2 consultation
City Hall - Council Chambers, Jean Pigott & Festival Control Boardroom
1 to 4 p.m. and 6 to 9 p.m.

November 22, 2016
Urban Forest Management Plan (UFMP): Phase 2 consultation
City Hall - Council Chambers, Jean Pigott, Colonel by, Richmond & Honeywell Boardrooms
6 to 9 p.m.

More info:
martha.copestake@ottawa.ca

December 6, 2016
Bank Street Renewal - Between Riverside Drive North and Ledbury Avenue
6 to 8:30 p.m.
Presentation at 7 p.m.
Jim Durrell Recreation Centre - Ellwood Hall
1265 Walkley Road
OC Transpo routes 1,8, 41, 87 and 146

More info:
ann.selfe@ottawa.ca

## What's Trending

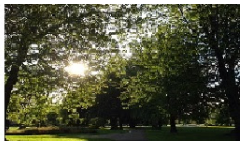
Fees Related to Planning Applications

O'Connor Street Bikeway

Identifying and Protecting Heritage Properties

Heritage Conservation Districts

Land Evaluation and Area Review



Urban Forest Management Plan

ottawa.ca
3-1-1
ATS 613-580-2401

# RÉUNIONS PUBLIQUES

Sauf avis contraire, toutes les réunions publiques se tiendront à l'hôtel de ville d'Ottawa, 110, avenue Laurier Ouest. Pour obtenir un ordre du jour complet et les mises à jour, inscrivez-vous aux alertes par courriel ou consultez ottawa.ca/ordresdujour, ou appelez le 3-1-1.

**Le lundi 19 décembre**
**Commission de services policiers d'Ottawa**
16 h, salle Champlain

**Le mardi 20 décembre**
**Séance de planification stratégique de mi-mandat du Conseil de santé d'Ottawa**
9 h, le Nepean Sailing Club 3259, avenue Carling

Saviez-vous que vous pouvez recevoir des avis par courriel concernant les réunions? Inscrivez-vous dès aujourd'hui à ottawa.ca/cyberabonnements.

Nº Pub 2016-501-S_Council_16122016

# AVIS DE RÉUNION PUBLIQUE
## Bassin de rétention des eaux pluviales à l'angle du chemin Baseline et de l'avenue Woodroffe
## Évaluation environnementale municipale de portée générale et conception fonctionnelle

**Le 9 janvier 2017**
**De 18 h 30 à 20 h 30 – Présentation à 19 h**
**Place-Ben-Franklin**
**101, promenade Centrepointe**

La Ville d'Ottawa a entrepris une évaluation environnementale municipale de portée générale concernant l'aménagement d'un bassin de rétention des eaux pluviales à l'angle nord-est du chemin Baseline et de l'avenue Woodroffe. L'aménagement d'un tel bassin avait été initialement recommandé dans l'Étude sur la rénovation de l'installation de gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011) et avait fait l'objet d'une nouvelle évaluation dans le cadre de l'Étude de faisabilité pour l'installation de gestion des eaux pluviales de surface à l'angle du chemin Baseline et de l'avenue Woodroffe (2015). Le bassin proposé assurera le traitement et la régulation des eaux de ruissellement provenant de quelque 435 hectares qui s'écoulent actuellement d'une manière incontrôlée vers le ruisseau Pinecrest.

L'étude sur l'aménagement du bassin, conformément à l'annexe B de l'évaluation environnementale municipale de portée générale, permettra de définir l'option et la conception fonctionnelle qui conviennent le mieux pour l'aménagement.

Une présentation sur le contexte du projet, l'état actuel du site, les autres bassins envisageables et la solution privilégiée de façon préliminaire sera faite lors de la réunion. Le personnel de la Ville et l'équipe chargée de l'étude seront sur place pour répondre à vos questions et recueillir vos commentaires.

Pour en savoir plus sur le projet, visitez ottawa.ca/bassinderetentionbaselinewoodroffe.

**Si vous souhaitez que votre nom soit ajouté à la liste d'envoi, ou si vous avez d'autres questions, communiquez avec la personne-ressource suivante.**

Darlene Conway, P. Eng.
Gestionnaire principale de projet, Gestion des biens
Ville d'Ottawa
Tél. : 613-580-2424, poste 27611
Courriel : Darlene.Conway@ottawa.ca

Nº Pub 2016-507-S_Baseline Woodroffe Stormwater_15122016

# Under the age of 16? Adult supervision required

## BRYNNA LESLIE

### Capital Muse

In recent conversations with my dad, I heard some great stories about his childhood. On summer mornings in the '50s, he and his little brother were booted out the door and basically told not to come back until sundown. They often rode nearly 10 kilometres across and then down "the Hamilton Mountain" into Stoney Creek on the highway. No helmets; no parents; once, not even a set of working brakes. My dad was seven-years-old.

At the same age, I was an after school latchkey kid and routinely sent to the store two city blocks away to buy milk. At 11, I was a full-time babysitter for a summer.

Fast forward a few decades and I think parents would find themselves in some pretty hot water if it was discovered a seven-year-old was shut out of the house on a summer day or sent on errands, but not necessarily legal hot water. Cultural norms may dictate that a seven-year-old nowadays can barely sneeze without a parent at hand to offer a tissue, but the law is ambiguous at best.

I routinely hear parents wax about 11 or 12 as a legal minimum for children to be left alone

I routinely hear parents wax about 11 or 12 as a legal minimum for children to be left alone. In fact only three provinces actually have laws dictating the minimum age at which a child can be unsupervised. In New Brunswick and Manitoba, kids have to be 12 before they can stay home alone. Quebec and others have no such law.

In Ontario, the minimum age is 16. It's kind of funny, actually, because kids can babysit at 11, acquire a snowmobile licence at 12 and get a job at 14. But they can't be left alone until driving age?

It's true. Ontario's Child and Family Services Act states that a child under the age of 16 may not be left unattended "without making provision for his or her supervision and care that is reasonable in the circumstances."

I think most of us would be hard-pressed to find a high school kid attending an after school daycare program or heading home to nanny care, however. That's because "reasonable in the circumstances" is largely left open to interpretation under the law.

I've attempted to take a balanced approach with my own children. My eldest, on the cusp of turning 12 has routinely asked if I'll drop him off at the mall with a friend. We haven't done that yet. But we're training him up.

He's stayed home for an hour or two on his own, taken transit limited distances and supervised his younger sister in the backyard for short periods while I'm making dinner. I've sent the two eldest, now 10 and 11, on walking errands to the store or to their piano lesson at the end of the block. In a group of kids, I'm comfortable with kids that age going to the park in daylight hours, providing there's no wandering about the neighbourhood – mostly fearful of their inattention to traffic, rather than strangers.

Sadly, even responsible parents who attempt to interpret the law are subject to policing by others. Recently, a Facebook acquaintance announced she'd called the Children's Aid Society and police after discovering a pair of 10-year-olds wandering around in a small town Wal-mart for an hour. She received many congratulations from others on Facebook, calling the parents of the children irresponsible, disgusting and unfit. It's not an uncommon scenario.

We parents put ourselves on the line when we attempt to give our kids some freedoms on their journey toward independence. But it's worth noting that limiting a child's exposure at a reasonable age to time without adults may do them more harm than good. For one thing, kids often live up to responsibility. Armed with the right tools, they will better learn to trust themselves and problem solve on their own, given the opportunity to do so without a nagging adult in the vicinity

Our collective fear of strangers is also inadvertently limiting kids' exposure to exercise and nature. In practice, by not allowing children of a reasonable age to play outdoors, kids are stuck on their parents' time clock. No surprise, then, that fewer than 10 per cent of Canadian kids are getting enough exercise. What parent has time to frolic and play on a child's schedule?

As my eldest kids enter the tween stage, I'm challenged to navigate the muddy waters. One thing I know for sure, however? It's probably a good idea to let them have some unsupervised time before I give them the keys to the car.


*Megan DeLaire/Metroland*

**A collision involving a tractor trailer and two other vehicles on Highway 416 near West Hunt Club Road sent three people to hospital with non-life threatening injuries and resulted in the closure of a northbound lane of the highway on Dec. 6.**



# Three injured in collision with tractor-trailer on Highway 416

**MEGAN DELAIRE**
mdelaire@metroland.com

Three people were taken to hospital with non-life threatening injuries after a collision involving a tractor-trailer and two cars on Highway 416 on Dec. 6.

The crash took place shortly before 11 a.m. in the northbound lanes near West Hunt Club Road, with a silver sedan and the cab of the tractor-trailer coming to rest in the median.

OPP are investigating the cause of the collision. One northbound lane was closed as a result of the crash and remained closed as of 12:30 p.m.

Although police, paramedics and firefighters responded, none of the drivers required extrication. According to paramedics, three patients from the two cars were treated and transported to hospital with minor injuries. One patient, a woman in her 70s, was also treated for a suspected head injury.

The driver of the tractor-trailer was not injured.

Paramedic spokesman JP Trottier pointed out that the collision could very easily have been tragic.

On Dec. 4, Brian and Mary Ward, a couple from Ottawa, were killed in a collision with a tractor-trailer on Highway 7, near Kaladar, Ont.

"Whenever a vehicle gets into a collision with a tractor-trailer, the injuries can be fatal very easily," Trottier said. "Nowadays with airbags people can be very well protected, but still, when you're colliding with a tractor-trailer – especially at the speeds they go at highways – it can instantly become a fatal collision.

"So it's certainly good to hear these were just bumps and bruises for the most part."

[redacted]

[redacted]

Planning and Development E-newsletter - December 2016

City of Ottawa <planning@ottawa.ca> Mon, Dec 19, 2016 at 3:33 PM

[redacted]

View in browser

# Planning and Development

## Chair Harder's Y ear End Message

It has been a very productive year for everyone, thanks to the hard work of the Committee Members and staff in 2016. I look forward to more in 2017. A few highlights:

- New regulations for detached secondary dwelling units, known as coach houses. Following changes to the Planning Act in 2012, the Government of Ontario required municipalities to allow this form of residence as a means to encourage discreet intensification and more affordable housing in established neighbourhoods. The proposed regulation meets the provincial requirement, with rules that ensure these secondary units are not too large.

- The Ontario Municipal Board recommended that Ottawa use 2036 as a planning horizon for its Official Plan. Two major studies – the Employment Land Review and the Land Evaluation and Area Review for Agriculture update – were completed, using this new planning horizon. These studies inform the growth projections, policies, and changes to land use designations and mapping as part of a comprehensive Official Plan review.

- A feasibility study for a tunnel from the Macdonald-Cartier Bridge to Highway 417 with Transportation Committee concluding that a tunnel for mixed traffic is technically possible. The next step will seek funding from our federal and provincial partners for an environmental assessment study.

- A review of its Permanent Signs on Private Property By-law to address a number of issues, including new forms of electronic signs and messaging boards. The new by-law strikes a balance between the need to identify places and businesses against the goals of reducing clutter and distracted driving and respecting the landscape of the city's heritage and natural areas.

- A new Community Design Plan for Kanata North and an updated plan for Riverside South, both of which integrate provisions of the Building Better and Smarter Suburbs project. The Kanata North plan will see commercial development along a widened March Road, four schools and four parks, plus a park-and-ride and pathway network for pedestrians and cyclists. The Riverside South plan features a more efficient community core, more shared public facilities and better connections for pedestrians and cyclists.

- Following the first comprehensive parking review for the inner-urban area since the 1960s, the City has

reduced or eliminated minimum parking requirements near rapid transit stations (particularly LRT), as well as along mainstreets and transit priority corridors.

- Woodlands – which include treed areas, woodlots or forested areas – vary in their level of significance based on features like size, ecological function, tree species, and economic and social value. The Official Plan is now amended to ensure a consistent approach to identifying significant woodlands, bringing it in line with provincial requirements. The staff report is attached to the City Council agenda for December 14, 2016.

- An exciting proposal to redevelop the site at Beechwood Avenue and St. Charles Street including the repurposing of the former St. Charles Church, a treasured heritage building in the neighbourhood. Residents in this and in nearby communities will benefit from the vibrant mix of planned uses proposed, which include a 55-unit residential building, retail space, restaurants and public open space, all centred on a large site.

- An environmental assessment study for the widening of the Airport Parkway and Lester Road to meet the transportation demands of the growing southern communities of Riverside South, Findlay Creek and Leitrim, as well as development at the Ottawa Macdonald-Cartier International Airport.

## Did You See the Sign?


The Planning and Development section of the City's website has been renewed. The new site features the following areas:

- Planning Ottawa
- Developing Ottawa
- Developer Information
- Development Information for Residents
- Get Involved
- Events
- Constructing Ottawa

The Planning Ottawa section is new and provides information on the planning process, how the Official Plan and Master Plans influence changes throughout the city and outlines the challenges faced by our growing city. Included in this section is a quick video introduction to planning – I Saw the Sign. Beginning with the development application signs displayed on potential development sites, the video provides a simple introduction to the planning process and how residents can get involved.

The Developing Ottawa section has two streams – developers and residents. Included in the residents stream is the All About Your Property section that provides answers to many common inquiries. In the Get Involved section you will find information on the Planning Primer courses, Development Application Search Tool and Public Consultations. Awards programs are featured in the Events category and you will find information on construction and infrastructure as well as major City projects in Constructing Ottawa.

## How to Plan Y our Coach House

Secondary dwelling units in accessory structures, termed coach houses in the City of Ottawa, were


approved by Council on October 26, 2016.

The City has created a document, titled: How to Plan Your Coach House in Ottawa [ PDF 6.1 MB ]. This document helps to understand the process and costs associated with building a coach house. This guide also provides answers to many questions associated with constructing a coach house.

Visit our coach house booth at the Ottawa Home & Remodelling Show:

EY Centre, 4899 Uplands Drive
January 19 and 20, 12 to 9 p.m.
January 21, 10 a.m. to 7 p.m.
January 22, 10 a.m. to 5 p.m.

## Density Index - Permitting Higher Density Mix-Use Developments

The purpose of the Density Index project is to create minimum required densities for all lands, within the designated intensification areas of the Official Plan. These include:

- Central Area
- Arterial Mainstreets
- Town Centres
- Mixed-Use Centres

These are identified as areas that are subject to required minimum densities because they are intended to promote land uses that attract large numbers of people, including residents, as well as employees and customers from both within and outside the neighbourhood. The intent is to permit and promote higher-density mixed use developments in areas which are easily accessed by the transportation system, including the forthcoming rapid transit network.

The Planning Committee meeting, at which this study's Official Plan and Zoning By-law Amendments will be heard, has been rescheduled to February 2017.

Need more information? Visit the project's website.

## Land Evaluation and Area Review (LEAR) Update

Using the parcel scoring of the Ottawa LEAR, City staff recommended changes to the Agricultural Resource area designation in draft Official Plan Amendment Update - 2016 at the City Council meeting on December 14, 2016.

The Ottawa-Carleton LEAR System, originally developed in 1997, is now updated to incorporate current soil and land use information. A number of the new LEAR factors have also been updated. The Ottawa Land Evaluation and Area Review for Agriculture (LEAR) report has two volumes:

• LEAR Volume 1 contains a description of the LEAR system and how properties are scored.
• LEAR Volume 2 contains LEAR data for each scored property.

Why did the City update the LEAR?

New soils mapping and changes in land use and the size and nature of

farms over the last 20 years warranted re-examining and updating the existing LEAR system. The Ontario Municipal Board also directed the City to complete the LEAR update as part of its consideration of appeals to Official Plan Amendment #150.

## Committee Approves Budget for 2017 and Canada Summer Games Bid

The City's Finance and Economic Development Committee approved a report recommending that the City confirm its bid to host the 2021 Canada Summer Games, including a financial commitment of $10.5 million, through in-kind City services and capital improvements to recreation and athletic facilities, and by showing strong community support for the event. These games, held in the last week of July and first two weeks of August, are the largest multi-sport event in Canada for young athletes and a training ground for Olympic athletes.

## Ottawa Art Gallery (OAG) and Arts Court Redevelopment

Construction of a new Ottawa Art Gallery and redevelopment of the Arts Court site is underway. Things continue to move along on the construction site. On the site for the new building, the concrete work for the public sector on all floor levels, the Concourse to the fourth floor, plus the roof were completed in September, 2016. The contractor now continues to work on mechanical and electrical for the new OAG, has finished pouring concrete for the hotel and is now pouring the first floors of the condominium tower.

Arts Court is still in session – take a look at the calendar of events, and check out a theatre or dance production.

Visit the OAG and Arts Court web pages for information on exhibitions, programs, and events, and for links to resident arts and culture groups as well as the Cultural Engineering project.

## Get Involved at an Upcoming Event

January 9, 2017
Claridge's community pre-application consultation: East LeBreton Flats (near 301 Lett Street)
Bronson Community Centre (Community Hall – 211 Bronson Ave.)
3:00 p.m.-8:00 p.m.

More Info:
Andrew.McCreight@ottawa.ca

January 9, 2017
Baseline/Woodroffe Stormwater Management Pond Open House
Ben Franklin Place
101 Centrepointe Drive
6:30 to 8:30 p.m. – Presentation at 7 p.m.

More Info:
Darlene.Conway@ottawa.ca

January 11, 2017
Elgin Street and Hawthorne Avenue Functional Design Study Open house
Seating for the presentation is limited, please register by Friday, January 6

Council Chambers & Jean Pigott Hall, Ottawa City Hall
110 Laurier Avenue West
5 to 7:30 p.m., presentation at 5:30 p.m.

More Info:
Vanessa.Black@ottawa.ca

January 19-22, 2017
Visit our coach house booth at the Ottawa Home & Remodelling Show
EY Centre, 4899 Uplands Drive
January 19 and 20, noon to 9 p.m.
January 21, 10 a.m. to 7 p.m.
January 22, 10 a.m. to 5 p.m.

More Info:
Emily.Davies@ottawa.ca

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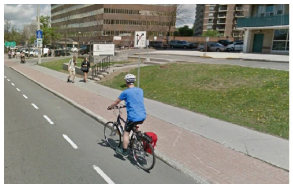
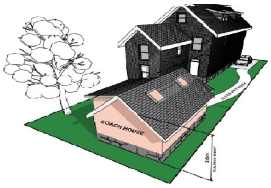
# What's Trending

Baseline and Woodroffe Stormwater Management Pond



Bank Street Renewal



How to Plan Your Coach House

| | |
|---|---|
| **From:** | Conway, Darlene |
| **Subject:** | FW: Baseline/Woodroffe SWM Pond Class EA - Public Meeting: January 9, 2017 / Bassin de rétention des eaux pluviales à l"intersection Baseline/Woodroffe évaluation environnementale- Réunion publique - le 9 janvier 2017 |
| **Date:** | Friday, January 06, 2017 4:35:14 PM |
| **Attachments:** | image001.jpg<br>image002.gif<br>BW pond POH flyer_bil.pdf<br>BWpond bassin.pdf |

Hello/Bonjour,

The display boards for the public meeting on January 9th can now be viewed at:
Ottawa.ca/baselinewoodroffepond
Ottawa.ca/bassinderetentionbaselinewoodroffe

Regards/Salutations,

DEC

**Darlene Conway, P. Eng.**
Senior Project Manager / Policy Development and Urban Design
Gestionnaire principal de projet / Service d'urbanisme et de la gestion de la croissance
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27611
ottawa.ca/planning / ottawa.ca/urbanisme

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**From:** Conway, Darlene
**Sent:** Monday, December 19, 2016 11:43 AM
**Subject:** FW: Baseline/Woodroffe Stormwater Management Pond Class Environmental Assessment - Public Meeting: January 9, 2017

Hello/Bonjour,

This is to confirm that the deadline for responding to the online questionnaire at:
Ottawa.ca/baselinewoodroffepond has been extended to **January 16, 2017.**

La présente est pour confirmer que la date limite pour répondre au questionnaire en ligne (Ottawa.ca/bassinderetentionbaselinewoodroffe) a été reportée au **16 janvier 2017**.

Regards/Salutations,

DEC

**Darlene Conway, P. Eng.**

Senior Project Manager / Policy Development and Urban Design
Gestionnaire principal de projet / Service d'urbanisme et de la gestion de la croissance

City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27611
ottawa.ca/planning / ottawa.ca/urbanisme

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**From:** Conway, Darlene
**Sent:** Thursday, December 15, 2016 2:22 PM
**Subject:** Baseline/Woodroffe Stormwater Management Pond Class Environmental Assessment - Public Meeting: January 9, 2017

Hello/Bonjour,

Thanks to all who have provided comments to date about the proposed pond.

A public meeting will be held on **January 9, 2017 from 6:30pm to 8:30pm at Ben Franklin Centre** (see attached for further details). A presentation about the proposed pond will be provided at 7pm, followed by a Question and Answer session.

More information about the project can be viewed at: Ottawa.ca/baselinewoodroffepond
Two background studies can be viewed at: http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html

In the mean time, if you have any additional comments or concerns, please do not hesitate to contact me.

Merci à tous ceux qui nous ont fait part de leurs commentaires concernant le bassin de gestion des eaux pluviales de Baseline et Woodroffe.

Une séance publique sera tenue **le 9 janvier 2017, de 18h30 à 20h30 au centre Ben Franklin** (voir ci-joint pour plus de détails). Une présentation concernant le bassin de rétention aura lieu à 19h, suivi d'une période de question et réponse.

Pour en savoir plus sur le projet, visitez: Ottawa.ca/bassinderetentionbaselinewoodroffe
Deux études de fond peuvent être consultées en cliquant sur le lien suivant:
http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html

Dans l'intervalle, n'hésitez pas à me contacter si vous avez des questions ou quelconque préoccupation.

Regards/Salutations,

DEC

**Darlene Conway, P. Eng.**
Senior Project Manager / Policy Development and Urban Design
Gestionnaire principal de projet / Service d'urbanisme et de la gestion de la croissance

City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27611
ottawa.ca/planning / ottawa.ca/urbanisme

# Notice of Public Meeting

## Baseline/Woodroffe Stormwater Management Pond Municipal Class Environmental Assessment and Functional Design

**January 9, 2017**
**6:30 to 8:30 p.m. – Presentation at 7 p.m.**
**Ben Franklin Place**
**101 Centrepointe Drive**

The City of Ottawa has initiated a Municipal Class Environmental Assessment (Class EA) for a proposed stormwater management pond at the northeast corner of Baseline Road and Woodroffe Avenue. A stormwater management pond was initially recommended in the Pinecrest Creek/Westboro Stormwater Management Retrofit Study (2011) and underwent further assessment in the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (2015).The proposed pond will provide water quality treatment and flow control for runoff from some 435 hectares that currently drain uncontrolled to Pinecrest Creek.

The study process is following the requirements of a Schedule B project under the Municipal Class and will identify a preferred alternative and functional design for the proposed pond.

At the meeting, a presentation will be provided covering the background to the project, existing conditions on the site, pond alternatives, and the preliminary preferred alternative. City staff and the study team will be on hand to answer questions and receive comments.

More information about the project can be viewed at: Ottawa.ca/baselinewoodroffepond .

**If you wish to have your name added to the mailing list or have further questions, please contact:**

Darlene Conway, P. Eng.
Senior Project Manager / Asset Management
City of Ottawa
Email: Darlene.Conway@ottawa.ca
613-580-2424 ext. 27611

# Avis de séance publique

## Bassin de rétention des eaux pluviales à l'angle du chemin Baseline et de l'avenue Woodroffe
## Évaluation environnementale municipale de portée générale et conception fonctionnelle

**Le 9 janvier 2017**
**De 18 h 30 à 20 h 30 – Présentation à 19 h**
**Place-Ben-Franklin**
**101, promenade Centrepointe**

La Ville d'Ottawa a entrepris une évaluation environnementale municipale de portée générale concernant l'aménagement d'un bassin de rétention des eaux pluviales à l'angle nord-est du chemin Baseline et de l'avenue Woodroffe. L'aménagement d'un tel bassin avait été initialement recommandé dans l'Étude sur la rénovation de l'installation de gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011) et avait fait l'objet d'une nouvelle évaluation dans le cadre de l'Étude de faisabilité pour l'installation de gestion des eaux pluviales de surface à l'angle du chemin Baseline et de l'avenue Woodroffe (2015). Le bassin proposé assurera le traitement et la régulation des eaux de ruissellement provenant de quelque 435 hectares qui s'écoulent actuellement d'une manière incontrôlée vers le ruisseau Pinecrest.

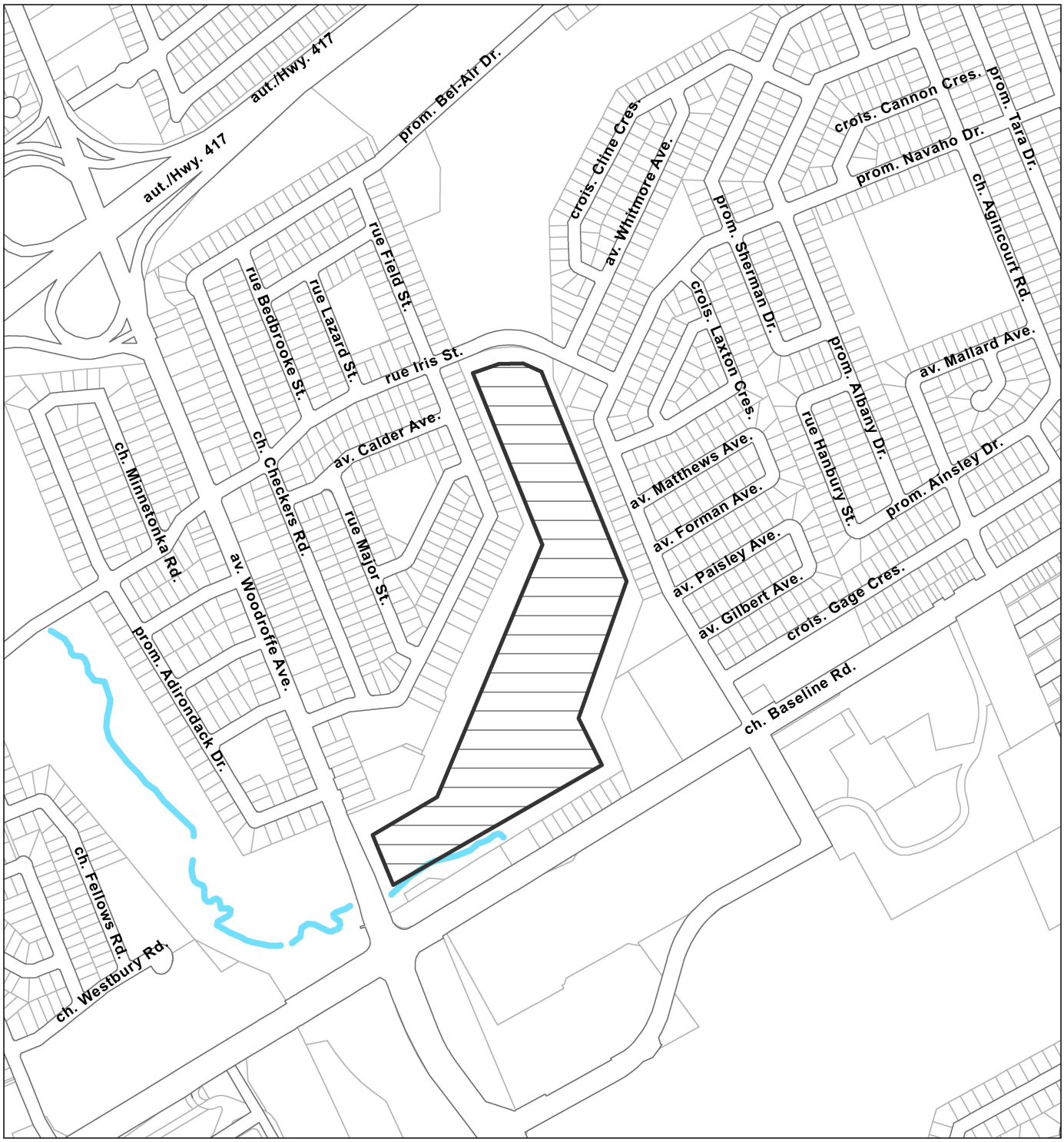
L'étude sur l'aménagement du bassin, conformément à l'annexe B de l'évaluation environnementale municipale de portée générale, permettra de définir l'option et la conception fonctionnelle qui conviennent le mieux pour l'aménagement.

Une présentation sur le contexte du projet, l'état actuel du site, les autres bassins envisageables et la solution privilégiée de façon préliminaire sera faite lors de la réunion. Le personnel de la Ville et l'équipe chargée de l'étude seront sur place pour répondre à vos questions et recueillir vos commentaires.

Pour en savoir plus sur le projet, visitez ottawa.ca/bassinderetentionbaselinewoodroffe.

**Si vous souhaitez que votre nom soit ajouté à la liste d'envoi, ou si vous avez d'autres questions, communiquez avec la personne-ressource suivante.**

Darlene Conway, P. Eng.
Gestionnaire principale de projet, Gestion des biens
Ville d'Ottawa
Courriel : Darlene.Conway@ottawa.ca
Téléphone : 613-580-2424, poste 27611




Ottawa PLANNING AND GROWTH MANAGEMENT / URBANISME ET GESTION DE LA CROISSANCE

16-0941-B

I:\CO\2016\ Location \BAselineWoodroffePond



REVISION / RÉVISION - 2016 / 07 /05

## LOCATION MAP / PLAN DE LOCALISATION

Ruisseau Pinecrest Creek

Location of proposed stormwater management pond
Emplacement du bassin de gestion des eaux pluviales proposé

NOT TO SCALE

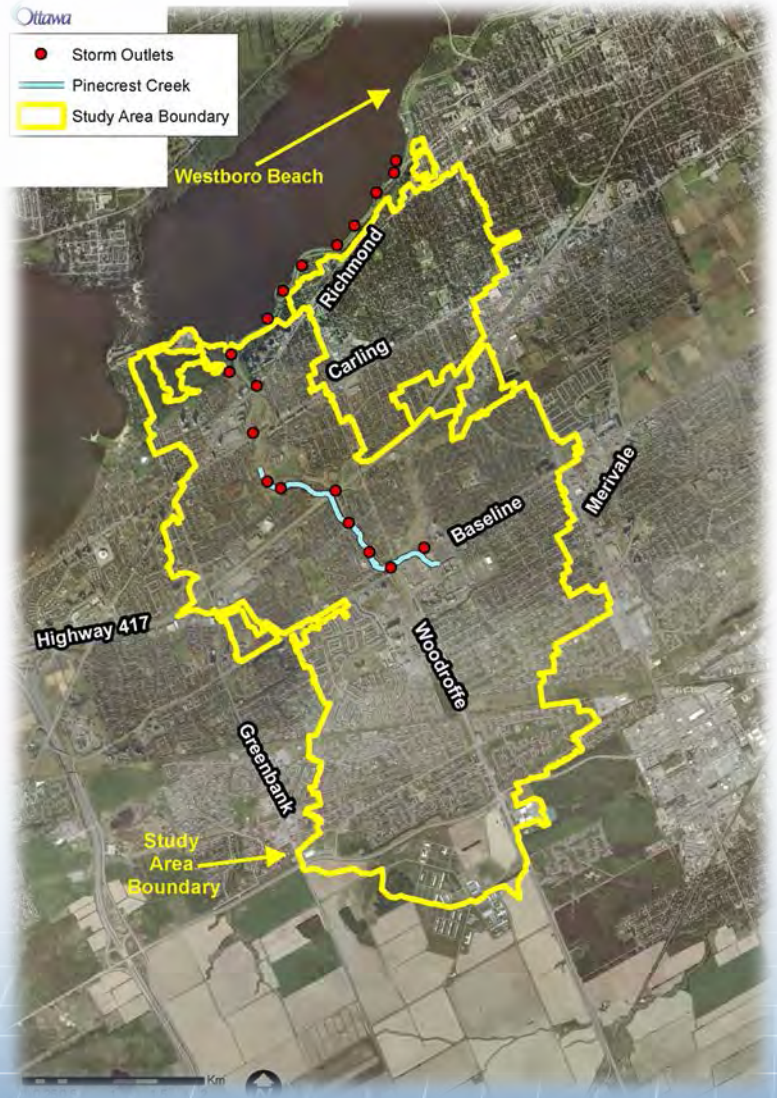
# Baseline/Woodroffe Stormwater Management Pond Class Environmental Assessment Study


*Public Meeting*
*January 9, 2017*

# Agenda

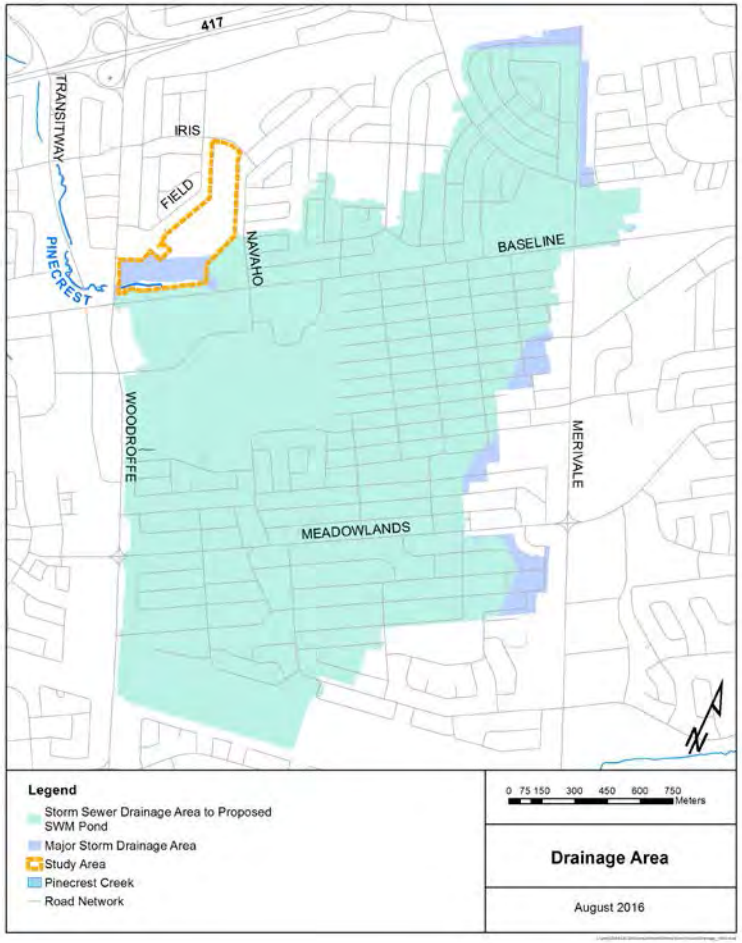
- Background
- Class Environmental Assessment Process
- Existing Conditions and Constraints
- Pond Options
- Overview of Comments Received to Date
- Next Steps

# Background




- Pond initially recommended in the *Pinecrest Creek SWM Retrofit Study* (2011) as part of a Master Plan for the Pinecrest Creek subwatershed
- Further study undertaken in the *Feasibility Study for a Surface SWM Facility at Baseline Road and Woodroffe Avenue* (2015) to confirm preliminary National Capital Commission (NCC) support
- Pond is on NCC lands

# Class Environmental Assessment (EA) Process

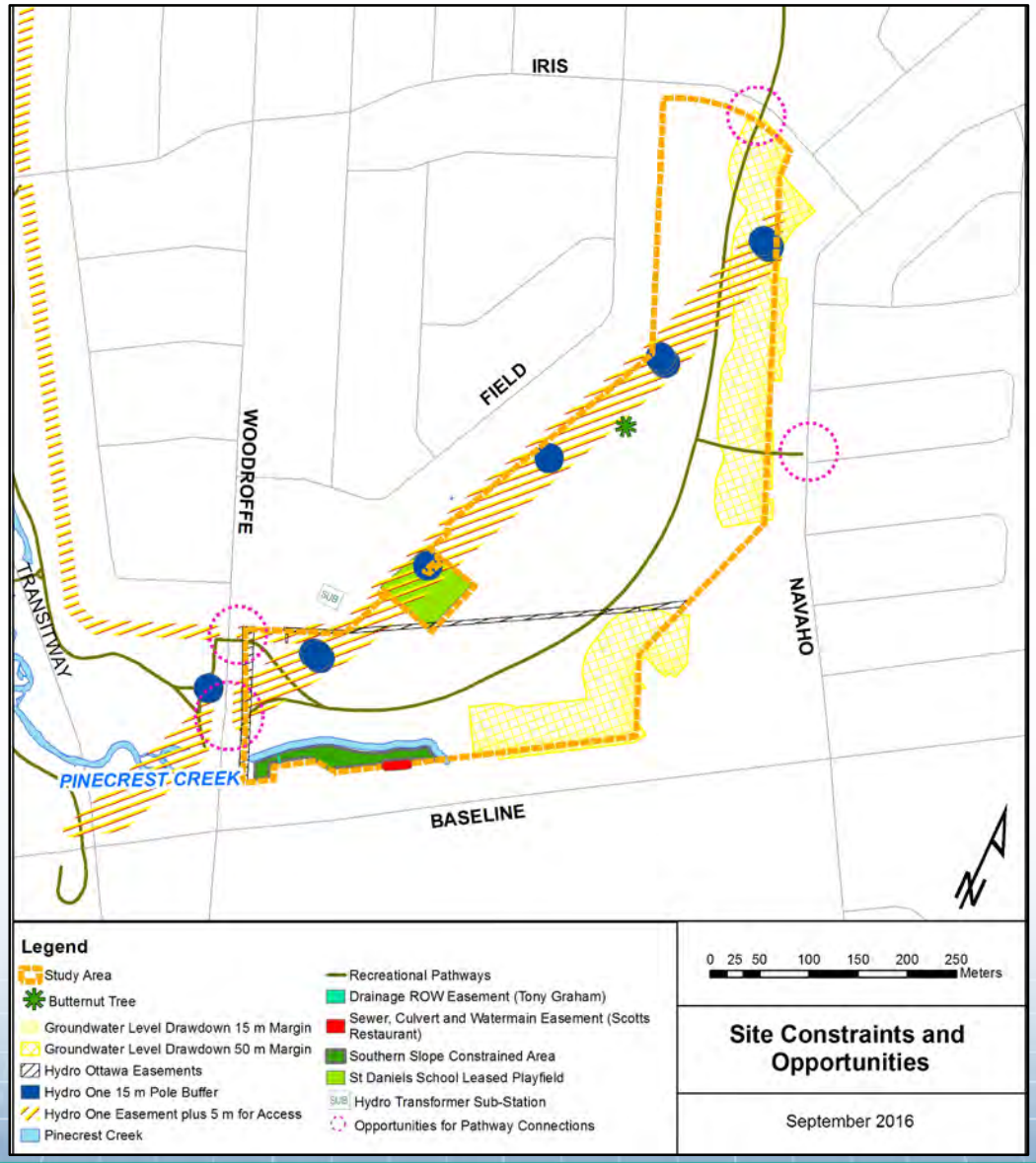



- Schedule B Class Environmental Assessment (Class EA) is now underway, requiring:
  - Identification of the existing conditions and constraints
  - Consideration of previous studies
  - Confirmation and assessment of the options for the SWM pond
  - Documentation of the process
- Class EA will identify a preferred option for the proposed pond

# Existing Conditions and Constraints

- Subsurface conditions
- Environmental contamination
- Fish and aquatic habitat
- Watercourses and wetlands
- Terrestrial vegetation
- Wildlife and habitat
- Species at Risk
- Aboriginal Land Claims
- Cultural heritage / archaeology
- Public land ownership
- Existing land use
- Infrastructure networks
- Recreation and pedestrian/cycling routes

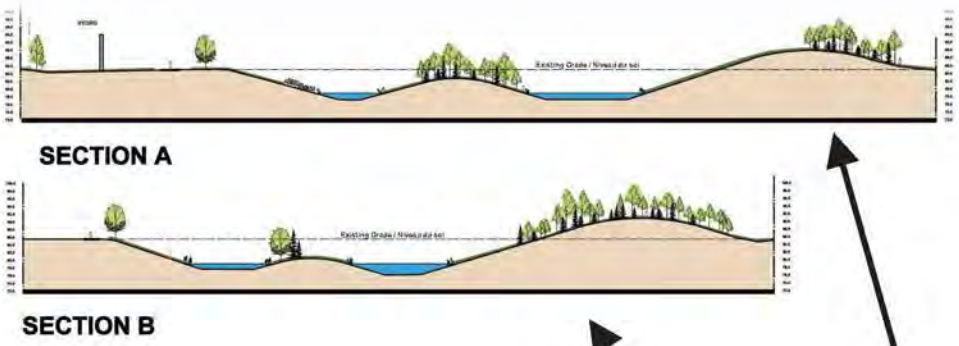
# Site Constraints



# Pond Options

- 2015 feasibility study developed 2 options to further detail how the pond could fit within the study area
- Both options:
  - Maximize water quality and flood control benefits
  - Reduce frequent flow impacts (erosion) on Pinecrest Creek
  - Integrate existing pathways
  - Provide for significant landscaping improvements
  - Are on NCC lands

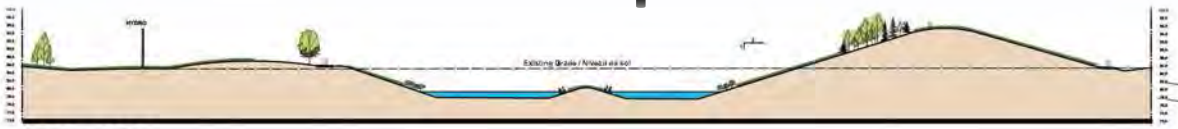
# Option 1

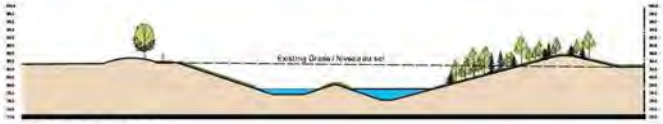

SECTION A
SECTION B

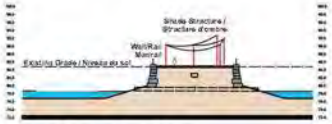

Legend / Légende
Proposed / Proposé
Bassin de gestion des eaux pluviales
Stormwater Management Pond
Pré
Meadow
Herbe tondue
Mown Grass
Aires de reboisement
Reforestation Planting
Plantation de gros arbres
Large Tree Planting
Plantation d'arbustes
Shrub Planting
Sentier récréatif asphalté de 3 m
3 m Asphalt Recreational Path
Contours (intervalles de 1 m)
Contours (1.0 m Intervals)
Limite de rabattement de 50 m
50 m Draw Down Limit
Existing / Existant
Contours (intervalles de 0.5 m)
Contours (0.5 m Intervals)
Ligne de transport d'électricité et poteau
Hydro Pole / Line
Végétation à garder
Vegetation to remain
Pond Features / Components
Caractéristiques et composantes du bassin
Entrée du bassin
A
Pond Inlet
Débordement du rapide 79.61
B
Riffle Overflow 79.61
Berme de déviation du débit
C
Flow Diversion Berm
Bassin d'admission
D
Forebay
Berme de sortie du bassin d'admission
E
Forebay Outlet Berm
Décharge de quantité
F
Quantity Outlet
Décharge de qualité à faible débit
G
Quality Flow Outlet
Route d'accès pour l'entretien
H
Maintenance Access Road
Ruisseau Pinecrest
I
Pinecrest Creek

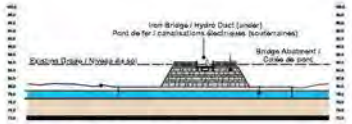

FIELD
MAVARO
ST. DANIEL ELEMENTARY SCHOOL
CELL NO.2
CELL NO.1
SECTION A
WOODROFFE
BASELINE

# Option 2


SECTION A


SECTION B


SECTION C (a)


SECTION C (b)


Bridge Option
See Section C(b)
Option du pont -
Voir la section C(b)


Legend / Légende
Proposed / Proposé
Bassin de gestion des eaux pluviales
Stormwater Management Pond
Pré
Meadow
Herbe tondue
Mown Grass
Aires de reboisement
Reforestation Planting
Plantation de gros arbres
Large Tree Planting
Plantation d'arbustes
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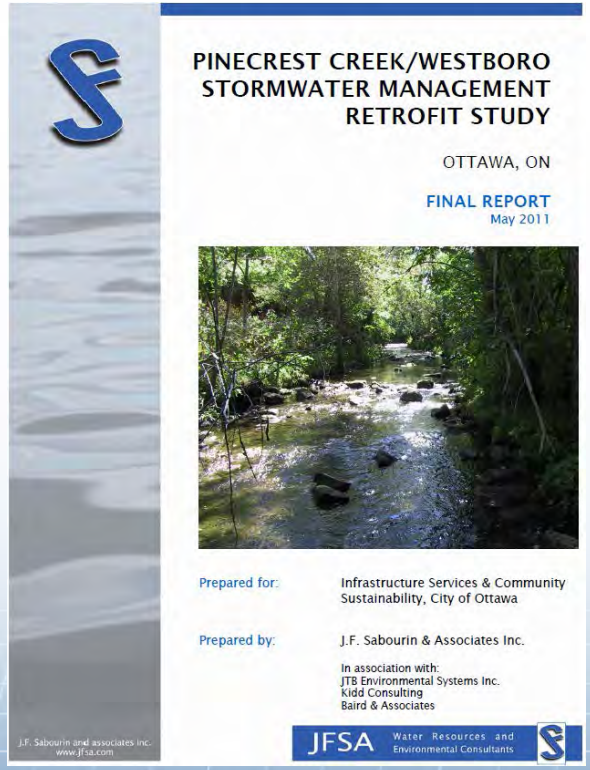
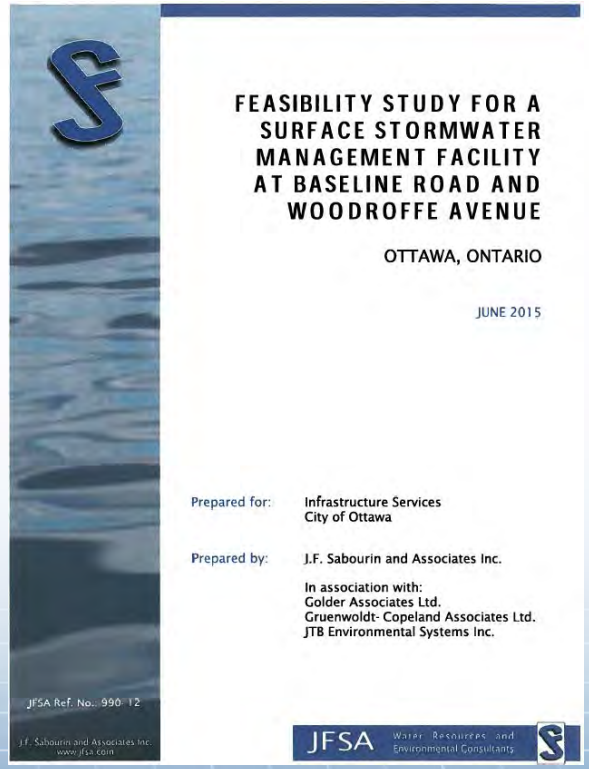
Décharge vers la cellule n° 2
D
Outlet to Cell No.2
Décharge vers la cellule n° 3
E
Outlet to Cell No.3
Décharge de quantité
F
Quantity Outlet
Décharge de qualité à faible débit
G
Quality Flow Outlet
Route d'accès pour l'entretien
H
Maintenance Access Road
Ruisseau Pinecrest
I
Pinecrest Creek


WOODROFFE
BASELINE
FIELD
IRIS
HAVARD
Espace ouvert
OPEN SPACE
SECTION A
SECTION B
SECTION C
CELL NO.1
CELL NO.2
CELL NO.3
St. Daniel Elementary School

# Comments & Responses (1/7)

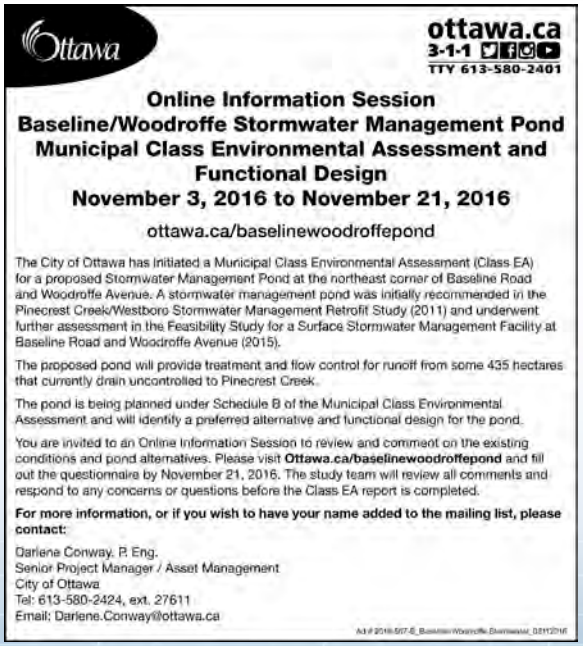
| Comment | Response |
|---|---|
| **Background Information and Decision Making Process**<br>*Justification for the pond/proposed location* | Project following through on recommendations from previous studies |



# Comments & Responses (2/7)

| Comment | Response |
|---|---|
| **Consultation and Notification**<br>*Insufficient and inadequate notification to date* | Public meeting provided in response to Online Open House<br>Required (Provincial) Class Environmental Assessment consultation process is being followed |



ottawa.ca
3-1-1
TTY 613-580-2401

**Online Information Session**
**Baseline/Woodroffe Stormwater Management Pond**
**Municipal Class Environmental Assessment and Functional Design**
**November 3, 2016 to November 21, 2016**

ottawa.ca/baselinewoodroffepond

The City of Ottawa has initiated a Municipal Class Environmental Assessment (Class EA) for a proposed Stormwater Management Pond at the northeast corner of Baseline Road and Woodroffe Avenue. A stormwater management pond was initially recommended in the Pinecrest Creek/Westboro Stormwater Management Retrofit Study (2011) and underwent further assessment in the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (2015).

The proposed pond will provide treatment and flow control for runoff from some 435 hectares that currently drain uncontrolled to Pinecrest Creek.

The pond is being planned under Schedule B of the Municipal Class Environmental Assessment and will identify a preferred alternative and functional design for the pond.

You are invited to an Online Information Session to review and comment on the existing conditions and pond alternatives. Please visit **Ottawa.ca/baselinewoodroffepond** and fill out the questionnaire by November 21, 2016. The study team will review all comments and respond to any concerns or questions before the Class EA report is completed.

**For more information, or if you wish to have your name added to the mailing list, please contact:**

Darlene Conway, P. Eng.
Senior Project Manager / Asset Management
City of Ottawa
Tel: 613-580-2424, ext. 27611
Email: Darlene.Conway@ottawa.ca

ottawa.ca
3-1-1
ATS 613-580-2401

**Avis de séance d'information en ligne**
**Bassin de rétention des eaux pluviales à l'intersection Baseline/Woodroffe**
**Évaluation environnementale de portée générale et étude de conception fonctionnelle**
**Du 3 novembre 2016 au 21 novembre 2016**

ottawa.ca/ bassinderetentionbaselinewoodroffe

La Ville d'Ottawa a entrepris une évaluation environnementale de portée générale concernant l'aménagement d'un bassin de rétention des eaux pluviales à l'angle nord-est du chemin Baseline et de l'avenue Woodroffe. L'aménagement d'un tel bassin avait été initialement recommandé dans l'Étude de modernisation de la gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011) et avait fait l'objet d'une nouvelle évaluation dans le cadre de l'étude de faisabilité pour l'installation de gestion des eaux pluviales de surface à l'angle du chemin Baseline et de l'avenue Woodroffe (2015).

Le bassin proposé assurera le traitement et la régulation des eaux de ruissellement provenant de quelque 435 hectares qui s'écoulent actuellement d'une manière incontrôlée vers le ruisseau Pinecrest.

L'étude d'aménagement du bassin, qui est effectuée en vertu de l'annexe B de l'évaluation environnementale municipale de portée générale, permettra de définir l'option et la conception fonctionnelle qui conviennent le mieux pour l'aménagement.

Nous vous invitons à une séance d'information en ligne dans le cadre de laquelle vous pourrez examiner et commenter les conditions actuelles et les options proposées pour le bassin. Consultez le site Web sur **ottawa.ca/ bassinderetentionbaselinewoodroffe** et remplir le questionnaire d'ici le 21 novembre 2016. L'équipe de l'étude examinera tous les commentaires reçus et répondra aux préoccupations et questions soulevées avant que le rapport d'évaluation environnementale de portée générale ne soit terminé.

Pour obtenir de plus amples renseignements ou faire ajouter votre nom à la liste d'envoi, veuillez communiquer avec :

Darlene Conway, P. Eng.
Gestionnaire principale de projet
Ville d'Ottawa
Tél. : 613-580-2424, poste 27611
Courriel : Darlene.Conway@ottawa.ca

# Comments & Responses (3/7)

| Comment | Response |
|---|---|
| **Recreation**<br>*Protection and enhancement of pathways for pedestrians and cyclists*<br><br>*Opportunity for complementary community uses* | Pedestrian pathways to be incorporated/ connected to City and NCC pathway networks<br><br>Complementary land uses may be considered at detailed design |

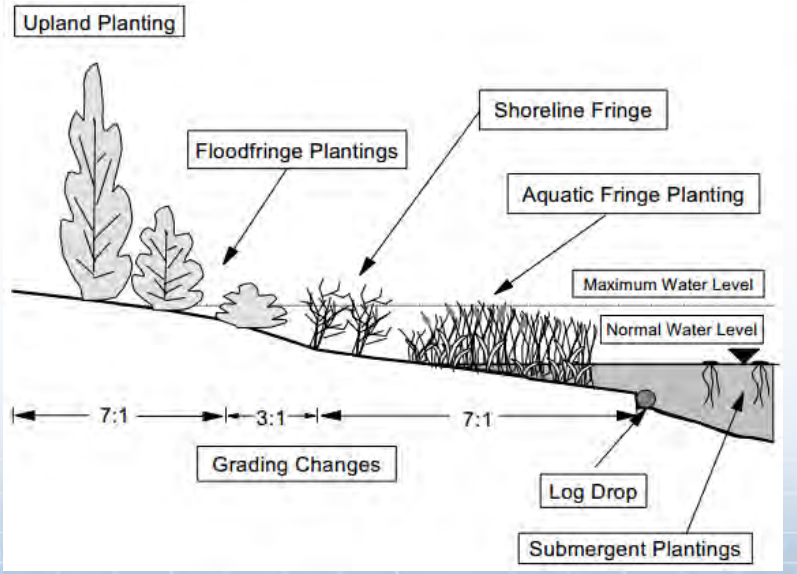

# Comments & Responses (4/7)

| Comment | Response |
|---|---|
| **Natural Environment and Creek Health**<br>*Enhance habitat for native wildlife and vegetation* | Proposed options have accounted for protection/enhancement of creek<br>Landscaping with native species |

# Comments & Responses (5/7)

| Comment | Response |
|---|---|
| **Safety, Human Health and Comfort**<br>*Undesirable byproducts of stagnant water*<br><br>*Risks associated with unsupervised body of water and proximity to vulnerable populations* | Pond will have sufficient water movement (minimize mosquitoes/algae)<br>Clear signage<br>Safe grading/side slopes<br>Pathway connections to consider “desire lines” and destinations such as schools |





# Comments & Responses (6/7)

| Comment | Response |
|---|---|
| **Pond Operation and Drainage**<br>*Concern that existing drainage issues will worsen*<br>*Maintenance of pond* | Site re-grading will not affect adjacent properties<br>City to maintain pond / ensure it continues to function properly |

# Comments & Responses (7/7)

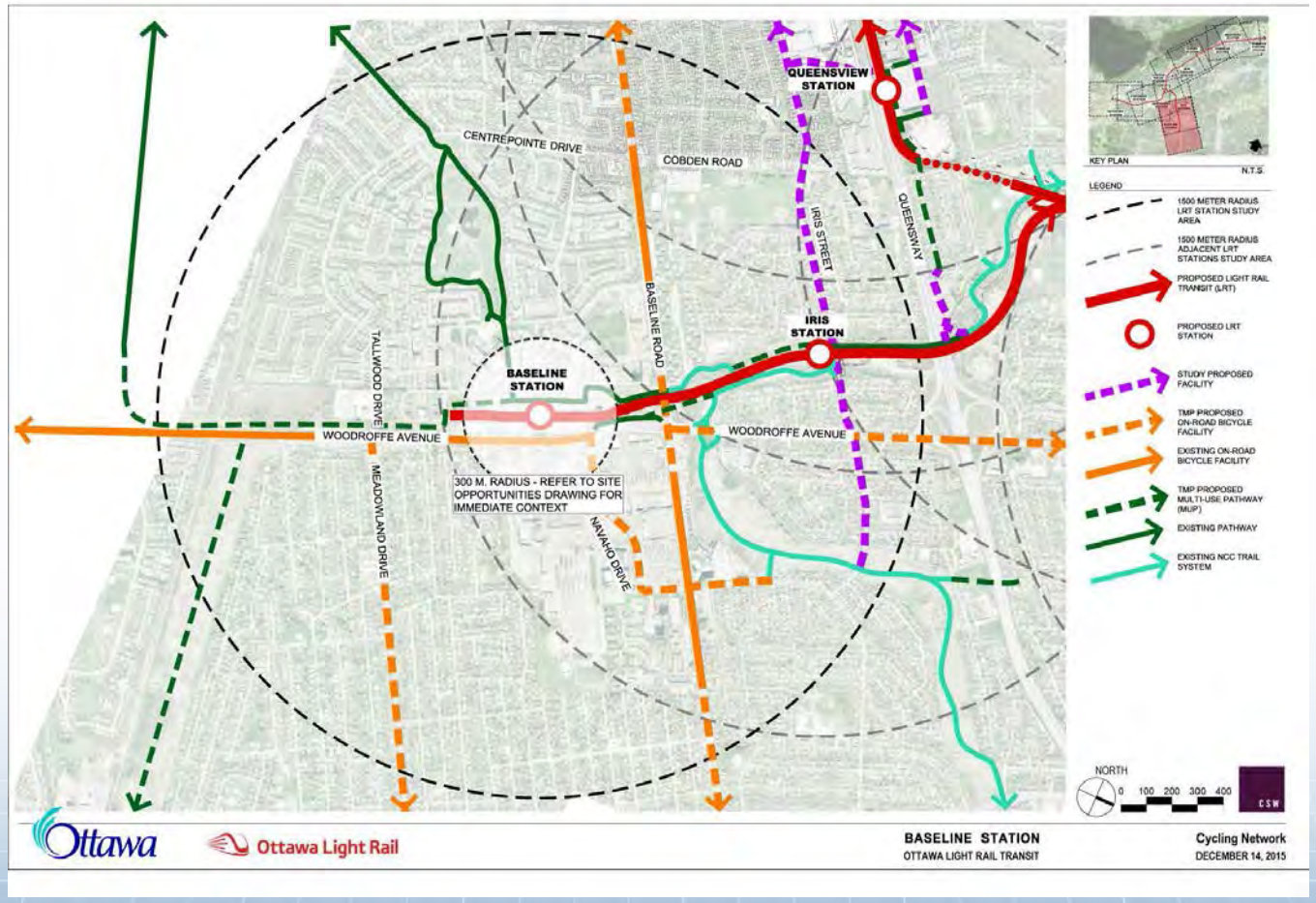
| Comment | Response |
|---|---|
| **Property and Residences**<br>*Decreased property values*<br><br>*Concern that litter will worsen* | Based upon experience with SWM ponds throughout the City, environmental, aesthetic and recreational benefits have made them valued community assets |

# Next Steps

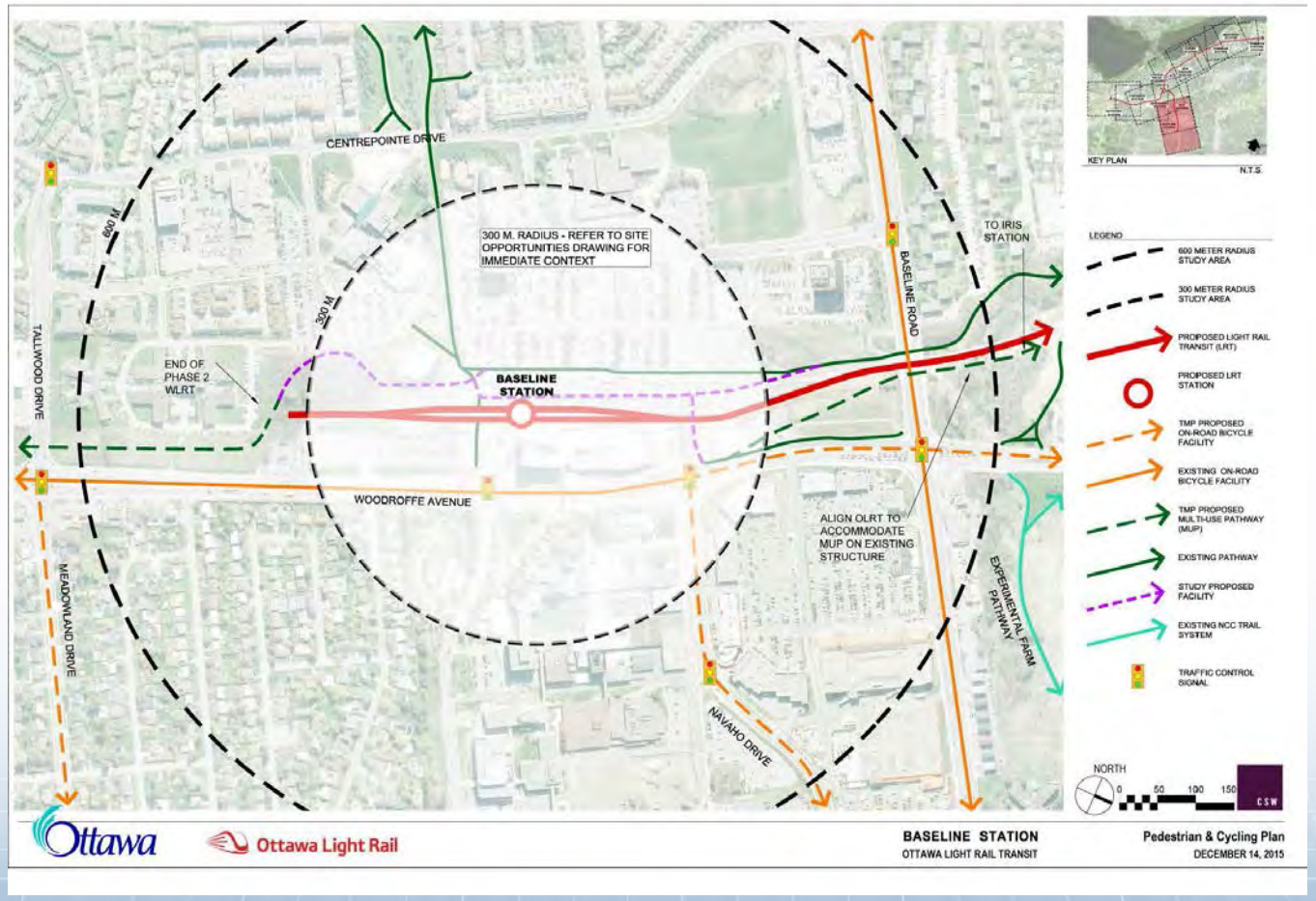
- Choose the preferred option (Winter 2017)
- Prepare the Class EA report (Winter 2017)
- Environment Committee and City Council approvals (Spring 2017)
- 30-day public review of Class EA Report (Spring 2017)
- Detailed design (2017)
- Construction (2018/2019)

# Questions?

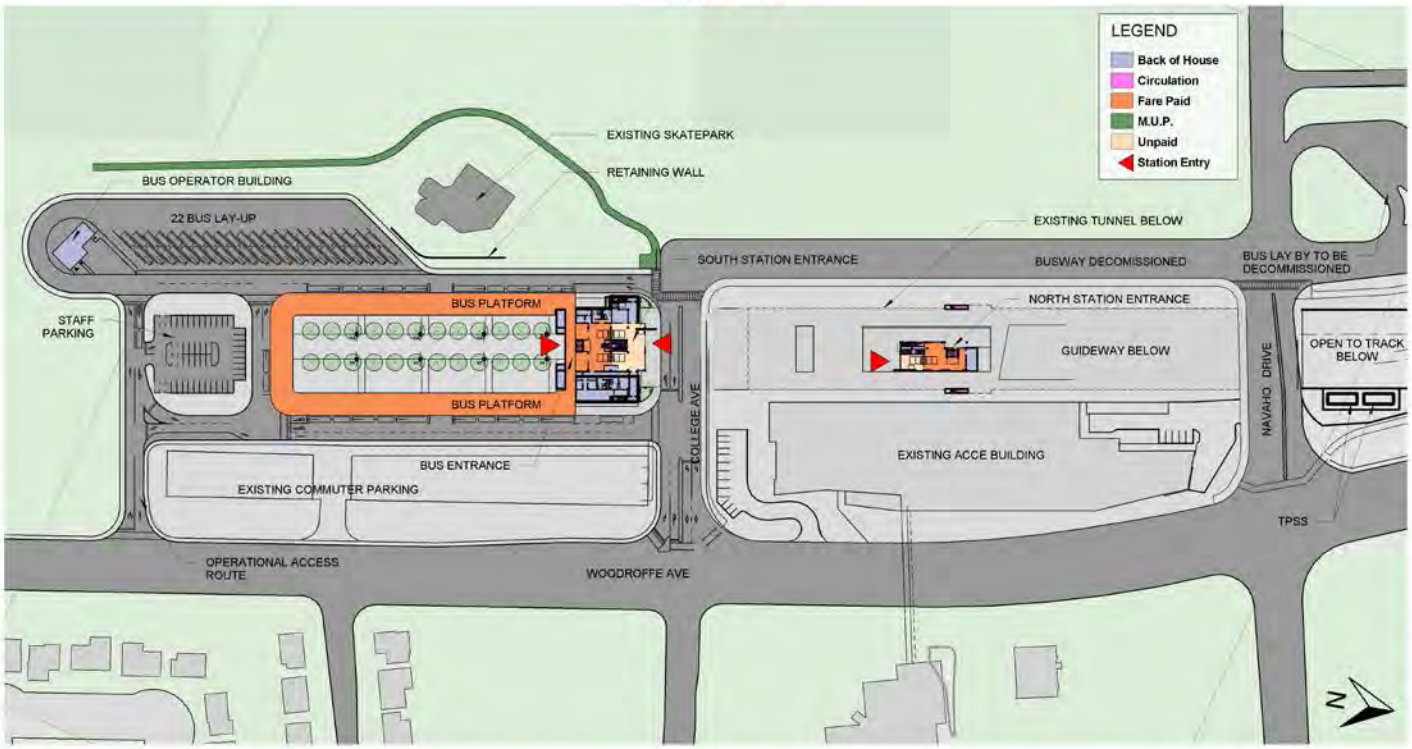
# Baseline Station Connectivity



# Baseline Station Connectivity



# Baseline Station Configuration



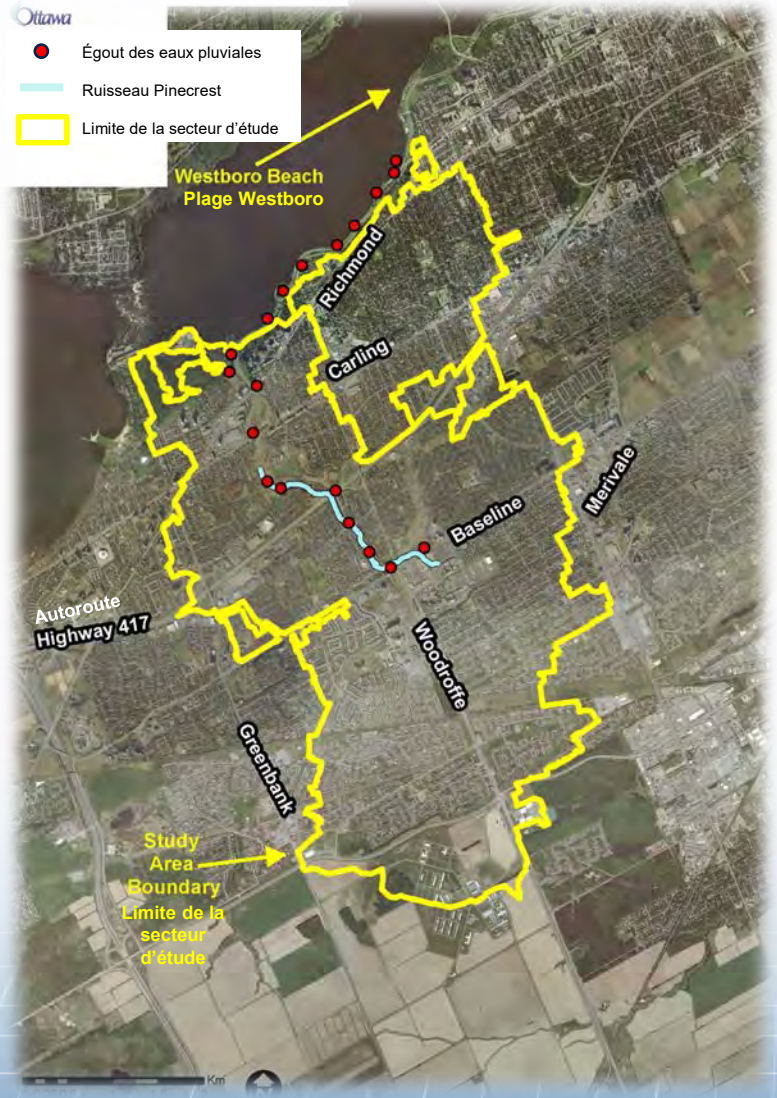
# Bassin de gestion des eaux pluviales de Baseline et Woodroffe
# Évaluation environnementale


*Séance publique*
*9 janvier 2017*

# L’ordre du jour

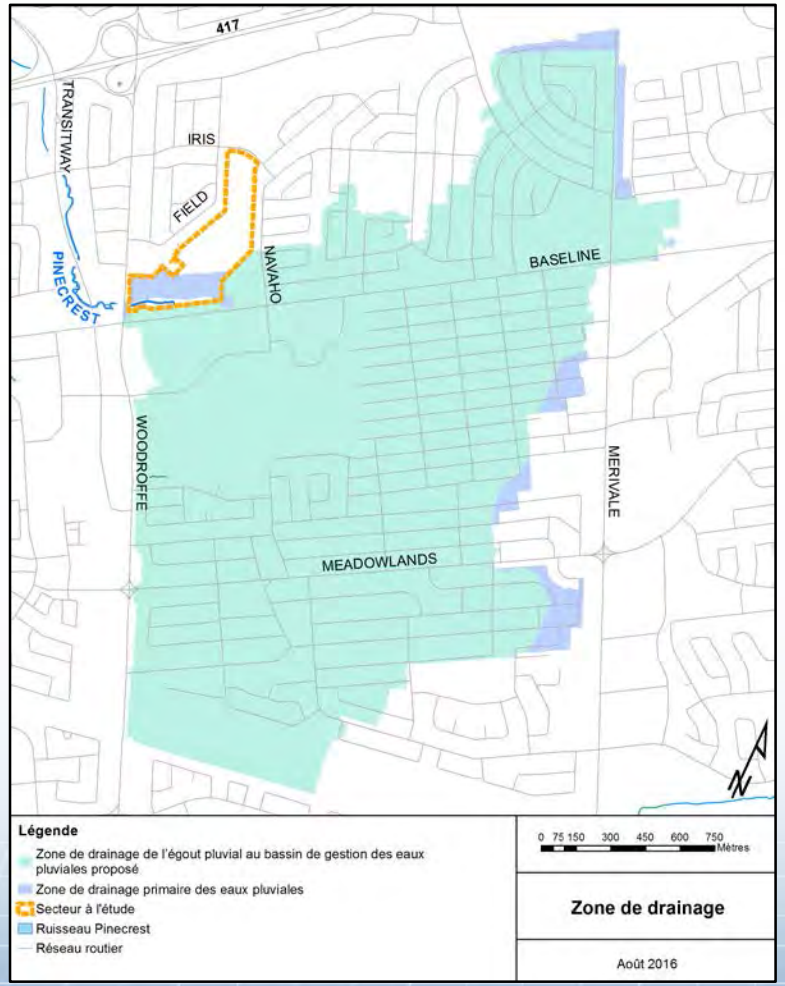
- Contexte
- Processus d’évaluation environnementale de portée générale
- Conditions actuelles et contraintes
- Options d’aménagement du bassin
- Résumé des commentaires recueillis à ce jour
- Prochaines étapes

# Contexte




- Bassin avait été initialement recommandé dans l'Étude de modernisation de la gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011), partie d'une plan directeur pour le sous-bassin hydrographique du ruisseau Pinecrest
- Avait fait l'objet d'une nouvelle évaluation dans le cadre de l'Étude de faisabilité pour l'installation de gestion des eaux pluviales de surface à l'angle du chemin Baseline et de l'avenue Woodroffe (2015) pour confirmer l'accord préliminaire de la Commission de la capitale nationale (CCN)
- Situé sur la propriété appartenant à la Commission de la capitale nationale (CCN)

# Processus d'évaluation environnementale (ÉE) de portée générale

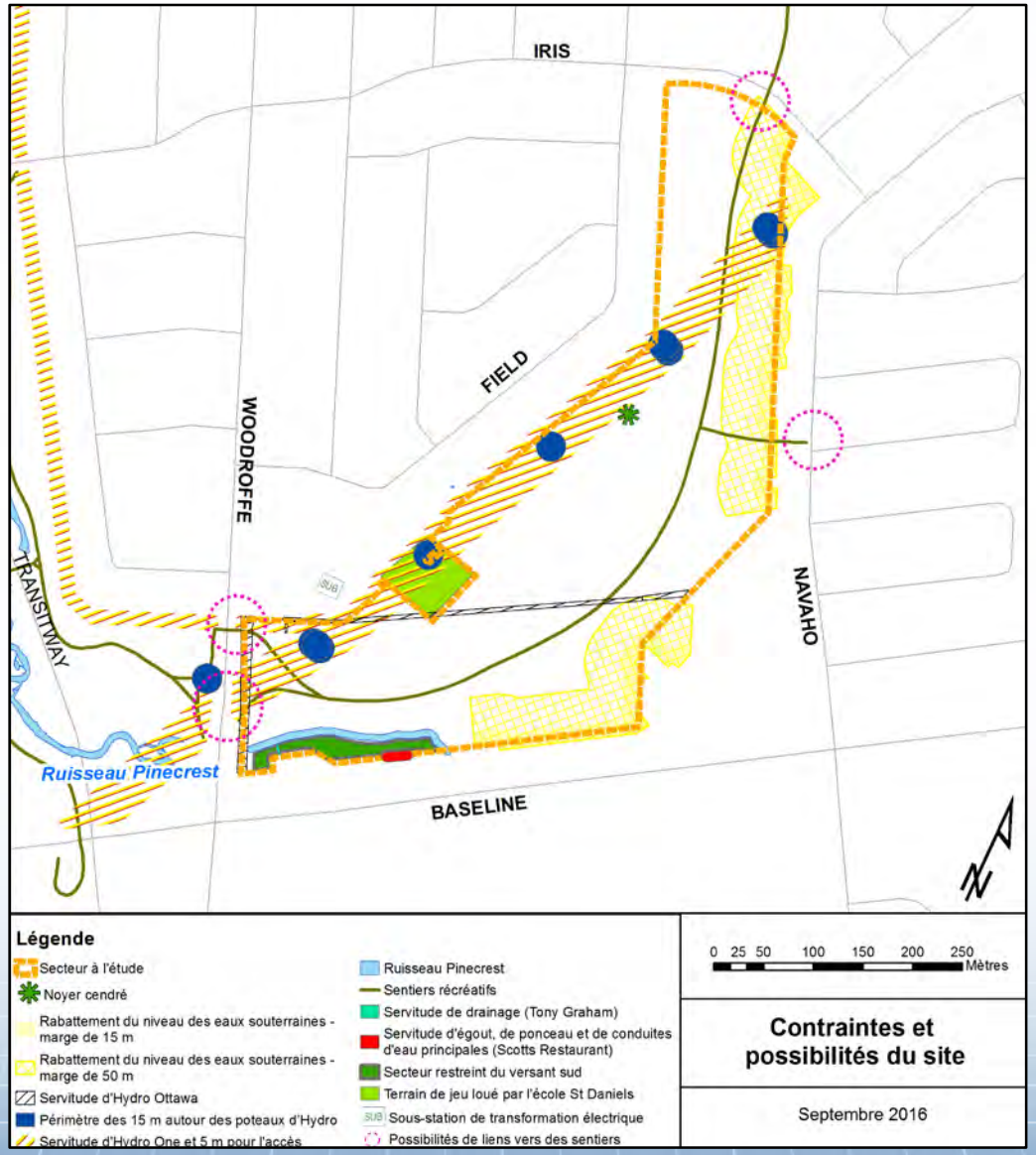



- L'Annexe B du document d'ÉE municipale de portée générale est en cours, qui s'exige:
  - Identification des conditions actuelles et les contraintes
  - Tenir compte des études antérieures
  - Confirmation et l'évaluation des options pour le bassin de GEP
  - Documentation du processus
- L'ÉE de portée générale permettra de définir une option privilégiées pour le bassin de GEP

# Conditions actuelles et contraintes

- Conditions en sous-surface
- Contamination environnementale
- Poissons et milieu aquatique
- Cours d'eau et zones humides
- Végétation terrestre
- Faune et habitats
- Espèces en péril
- Revendications territoriales des Autochtones
- Patrimoine culturel et archéologie
- Propriété des terrains publics
- Utilisation actuelle du sol
- Réseaux d'infrastructures
- Pistes récréatives, piétonnes et cyclables

# Contraintes du site



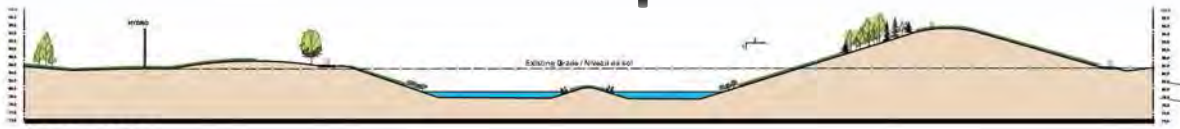
# Options d’aménagement du bassin

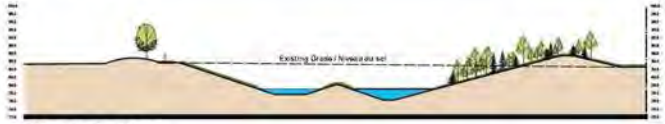
- L’étude de faisabilité de 2015 a développée 2 options pour élaborer comment le bassin pourra s’intégrer dans le secteur d’étude
- Les deux options:
  - optimisent la qualité de l'eau et les avantages pour la lutte contre les inondations;
  - réduise les effets des impacts du débit (érosion) sur le ruisseau Pinecrest;
  - intègrent des sentiers;
  - fourni des améliorations significatives pour l’aménagement paysager;
  - sont situés sur une propriété appartenant à la CCN.

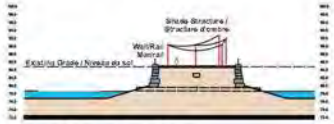
# Option 1

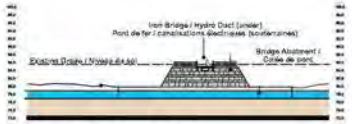

SECTION A
SECTION B
Legend / Légende
Proposed / Proposé
Bassin de gestion des eaux pluviales
Stormwater Management Pond
Pré
Meadow
Herbe tondue
Mown Grass
Aires de reboisement
Reforestation Planting
Plantation de gros arbres
Large Tree Planting
Plantation d'arbustes
Shrub Planting
Sentier récréatif asphalté de 3 m
3 m Asphalt Recreational Path
Contours (intervalles de 1 m)
Contours (1.0 m Intervals)
Limite de rabattement de 50 m
50 m Draw Down Limit
Existing / Existant
Contours (intervalles de 0.5 m)
Contours (0.5 m Intervals)
Ligne de transport d'électricité et poteau
Hydro Pole / Line
Végétation à garder
Vegetation to remain
Pond Features / Components
Caractéristiques et composantes du bassin
Entrée du bassin
A Pond Inlet
Débordement du rapide 79.61
B Riffle Overflow 79.61
Berme de déviation du débit
C Flow Diversion Berm
Bassin d'admission
D Forebay
Berme de sortie du bassin d'admission
E Forebay Outlet Berm
Décharge de quantité
F Quantity Outlet
Décharge de qualité à faible débit
G Quality Flow Outlet
Route d'accès pour l'entretien
H Maintenance Access Road
Ruisseau Pinecrest
I Pinecrest Creek
ST. DANIEL ELEMENTARY SCHOOL
CELL NO.2
CELL NO.1
SECTION A
SECTION B
FIELD
WOODROFFE
BASELINE
MAVARO

# Option 2


SECTION A


SECTION B


SECTION C (a)


SECTION C (b)


Bridge Option
See Section C(b)
Option du pont -
Voir la section C(b)


Legend / Légende
Proposed / Proposé
Bassin de gestion des eaux pluviales
Stormwater Management Pond
Pré
Meadow
Herbe tondue
Mown Grass
Aires de reboisement
Reforestation Planting
Plantation de gros arbres
Large Tree Planting
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Sentier récréatif asphalté de 3 m
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A
Pond Inlet
Débordement du rapide 79.61
B
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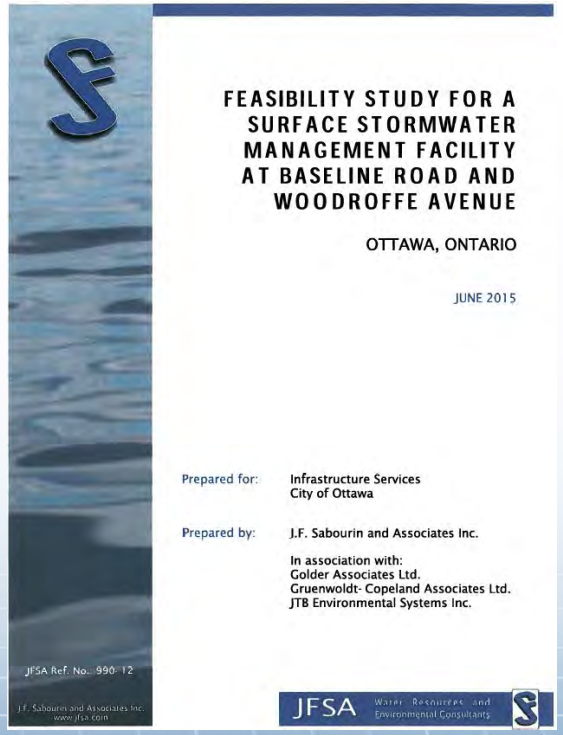
Berme de déviation du débit
C
Flow Diversion Berm
Décharge vers la cellule n° 2
D
Outlet to Cell No.2
Décharge vers la cellule n° 3
E
Outlet to Cell No.3
Décharge de quantité
F
Quantity Outlet
Décharge de qualité à faible débit
G
Quality Flow Outlet
Route d'accès pour l'entretien
H
Maintenance Access Road
Ruisseau Pinecrest
I
Pinecrest Creek


WOODROFFE
BASELINE
IRIS
HAVARD
FIELD
Espace ouvert
OPEN SPACE
ST. DANIEL ELEMENTARY SCHOOL
CELL NO.1
CELL NO.2
CELL NO.3
SECTION A
SECTION B
SECTION C

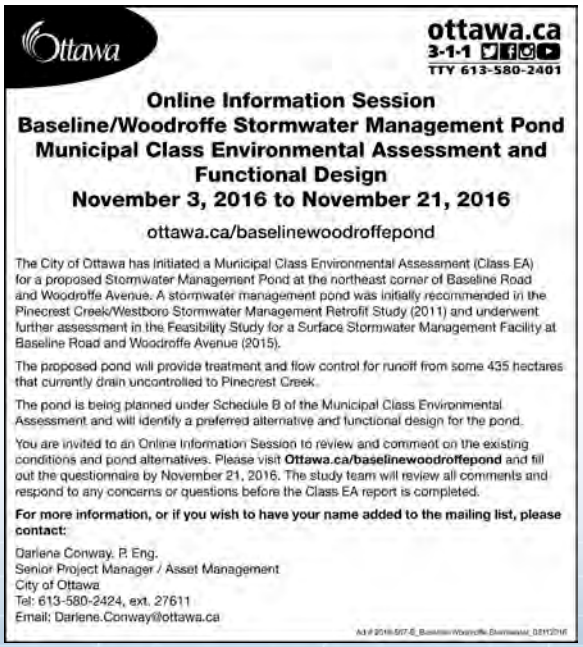
# Commentaires & Réponses (1/7)

| Commentaire | Réponse |
|---|---|
| **Information contextuelle et processus décisionnel**<br>*Justification du bassin et de l'emplacement proposé* | Poursuite et achèvement du projet sur la base des recommandations émises lors de précédentes études |

# Commentaires & Réponses (2/7)

| Commentaire | Réponse |
|---|---|
| **Consultation et avis**<br>*Avis insuffisants et inadéquats jusqu'à présent* | Réunion publique organisée en réponse à la séance portes ouvertes en ligne<br>Mise en place du processus obligatoire (provincial) de consultation sur l'évaluation environnementale de portée générale |



ottawa.ca
3-1-1
TTY 613-580-2401

**Online Information Session**
**Baseline/Woodroffe Stormwater Management Pond**
**Municipal Class Environmental Assessment and Functional Design**
**November 3, 2016 to November 21, 2016**

ottawa.ca/baselinewoodroffepond

The City of Ottawa has initiated a Municipal Class Environmental Assessment (Class EA) for a proposed Stormwater Management Pond at the northeast corner of Baseline Road and Woodroffe Avenue. A stormwater management pond was initially recommended in the Pinecrest Creek/Westboro Stormwater Management Retrofit Study (2011) and underwent further assessment in the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (2015).

The proposed pond will provide treatment and flow control for runoff from some 435 hectares that currently drain uncontrolled to Pinecrest Creek.

The pond is being planned under Schedule B of the Municipal Class Environmental Assessment and will identify a preferred alternative and functional design for the pond.

You are invited to an Online Information Session to review and comment on the existing conditions and pond alternatives. Please visit **Ottawa.ca/baselinewoodroffepond** and fill out the questionnaire by November 21, 2016. The study team will review all comments and respond to any concerns or questions before the Class EA report is completed.

**For more information, or if you wish to have your name added to the mailing list, please contact:**

Darlene Conway, P. Eng.
Senior Project Manager / Asset Management
City of Ottawa
Tel: 613-580-2424, ext. 27611
Email: Darlene.Conway@ottawa.ca

ottawa.ca
3-1-1
ATS 613-580-2401

**Avis de séance d'information en ligne**
**Bassin de rétention des eaux pluviales à l'intersection Baseline/Woodroffe**
**Évaluation environnementale de portée générale et étude de conception fonctionnelle**
**Du 3 novembre 2016 au 21 novembre 2016**

ottawa.ca/ bassinderetentionbaselinewoodroffe

La Ville d'Ottawa a entrepris une évaluation environnementale de portée générale concernant l'aménagement d'un bassin de rétention des eaux pluviales à l'angle nord-est du chemin Baseline et de l'avenue Woodroffe. L'aménagement d'un tel bassin avait été initialement recommandé dans l'Étude de modernisation de la gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011) et avait fait l'objet d'une nouvelle évaluation dans le cadre de l'étude de faisabilité pour l'installation de gestion des eaux pluviales de surface à l'angle du chemin Baseline et de l'avenue Woodroffe (2015).

Le bassin proposé assurera le traitement et la régulation des eaux de ruissellement provenant de quelque 435 hectares qui s'écoulent actuellement d'une manière incontrôlée vers le ruisseau Pinecrest.

L'étude d'aménagement du bassin, qui est effectuée en vertu de l'annexe B de l'évaluation environnementale municipale de portée générale, permettra de définir l'option et la conception fonctionnelle qui conviennent le mieux pour l'aménagement.

Nous vous invitons à une séance d'information en ligne dans le cadre de laquelle vous pourrez examiner et commenter les conditions actuelles et les options proposées pour le bassin. Consultez le site Web sur **ottawa.ca/ bassinderetentionbaselinewoodroffe** et remplir le questionnaire d'ici le 21 novembre 2016. L'équipe de l'étude examinera tous les commentaires reçus et répondra aux préoccupations et questions soulevées avant que le rapport d'évaluation environnementale de portée générale ne soit terminé.

Pour obtenir de plus amples renseignements ou faire ajouter votre nom à la liste d'envoi, veuillez communiquer avec :

Darlene Conway, P. Eng.
Gestionnaire principale de projet
Ville d'Ottawa
Tél. : 613-580-2424, poste 27611
Courriel : Darlene.Conway@ottawa.ca

# Commentaires & Réponses(3/7)

| Commentaire | Réponse |
|---|---|
| **Loisirs**<br>*Protection et amélioration des sentiers pour les piétons et les cyclistes*<br><br>*Utilisations communautaires complémentaires possibles* | Sentiers piétonniers à intégrer/relier aux réseaux de sentiers de la Ville et de la CCN<br><br>Des utilisations du sol complémentaires pourraient être envisagées lors de la conception détaillée |

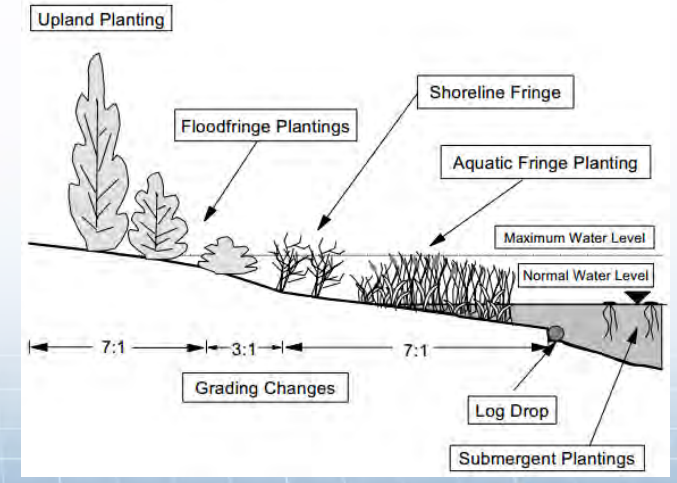

# Commentaires & Réponses(4/7)

| Commentaire | Réponse |
|---|---|
| **Environnement naturel et santé du ruisseau**<br>*Amélioration de l'habitat naturel pour la faune et la flore indigènes* | Les options proposées tiennent compte de la protection et de la mise en valeur du ruisseau<br>Aménagement paysager réalisé à l'aide d'espèces indigènes |

# Commentaires & Réponses (5/7)

| Commentaire | Réponse |
|---|---|
| **Sécurité, santé et confort des personnes**<br>*Effets indésirables de l'eau stagnante*<br><br>*Risques associés à un cours d'eau sans supervision et proximité de populations vulnérables* | La circulation de l'eau du bassin sera suffisante (présence limitée de moustiques et d'algues)<br>Signalisation claire<br>Nivellement et pentes de talus sans danger<br>Les sentiers doivent tenir compte des « lignes de désir » et de certaines destinations, comme les écoles |





# Commentaires & Réponses (6/7)

| Commentaire | Réponse |
|---|---|
| **Fonctionnement et drainage du bassin**<br>*Préoccupation concernant l'aggravation des problèmes de drainage actuels*<br><br>*Entretien du bassin* | Le nivellement de l'emplacement n'aura aucune conséquence sur les propriétés adjacentes<br>La Ville devra entretenir le bassin et veiller à ce qu'il continue de bien fonctionner |

# Commentaires & Réponses (7/7)

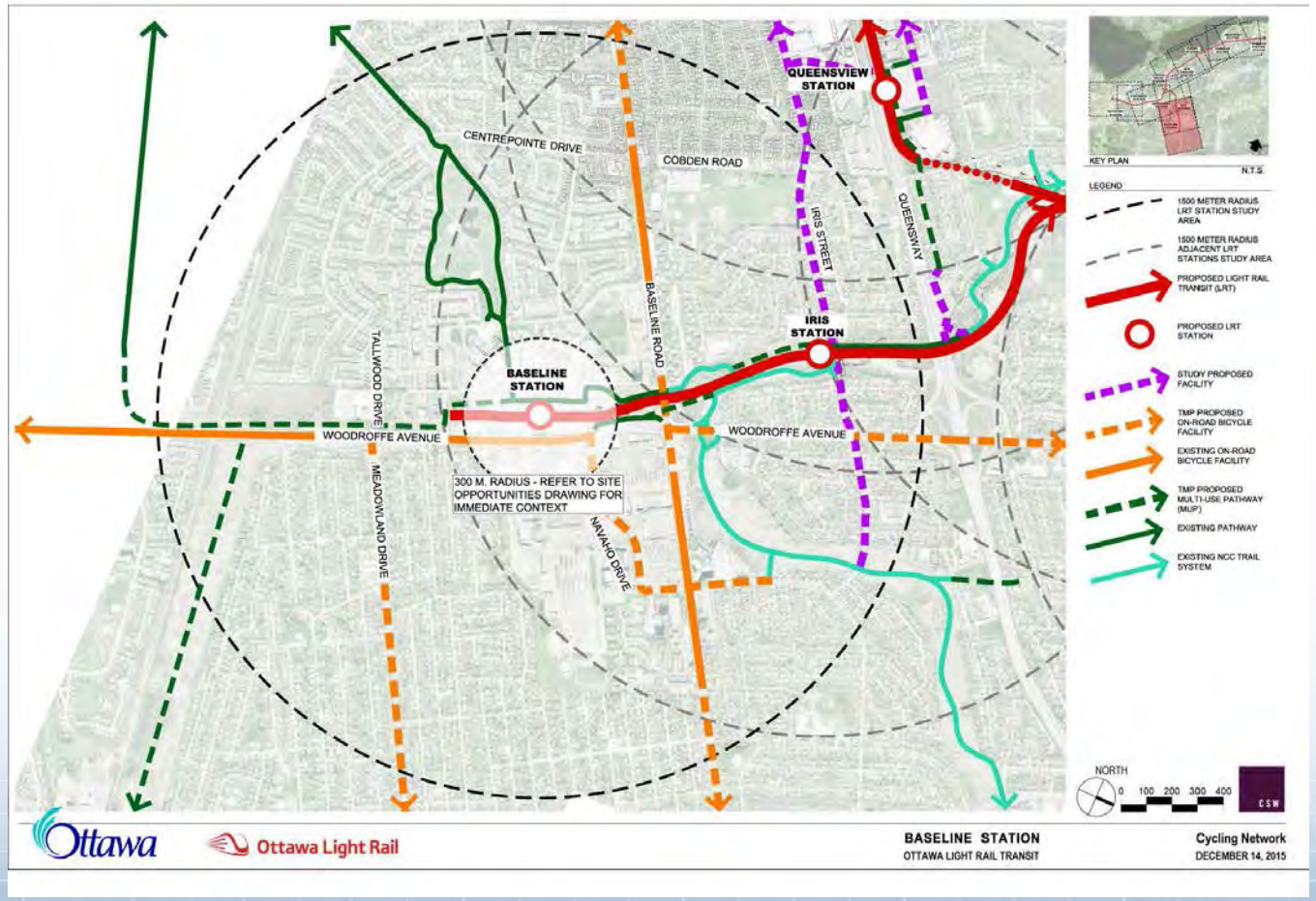
| Commentaire | Réponse |
|---|---|
| **Propriété et résidences**<br>*Diminution de la valeur des propriétés*<br><br>*Préoccupation concernant l'aggravation de la pollution* | Based upon experience with SWM ponds throughout the City, environmental, aesthetic and recreational benefits have made them valued community assets |

# Prochaines étapes

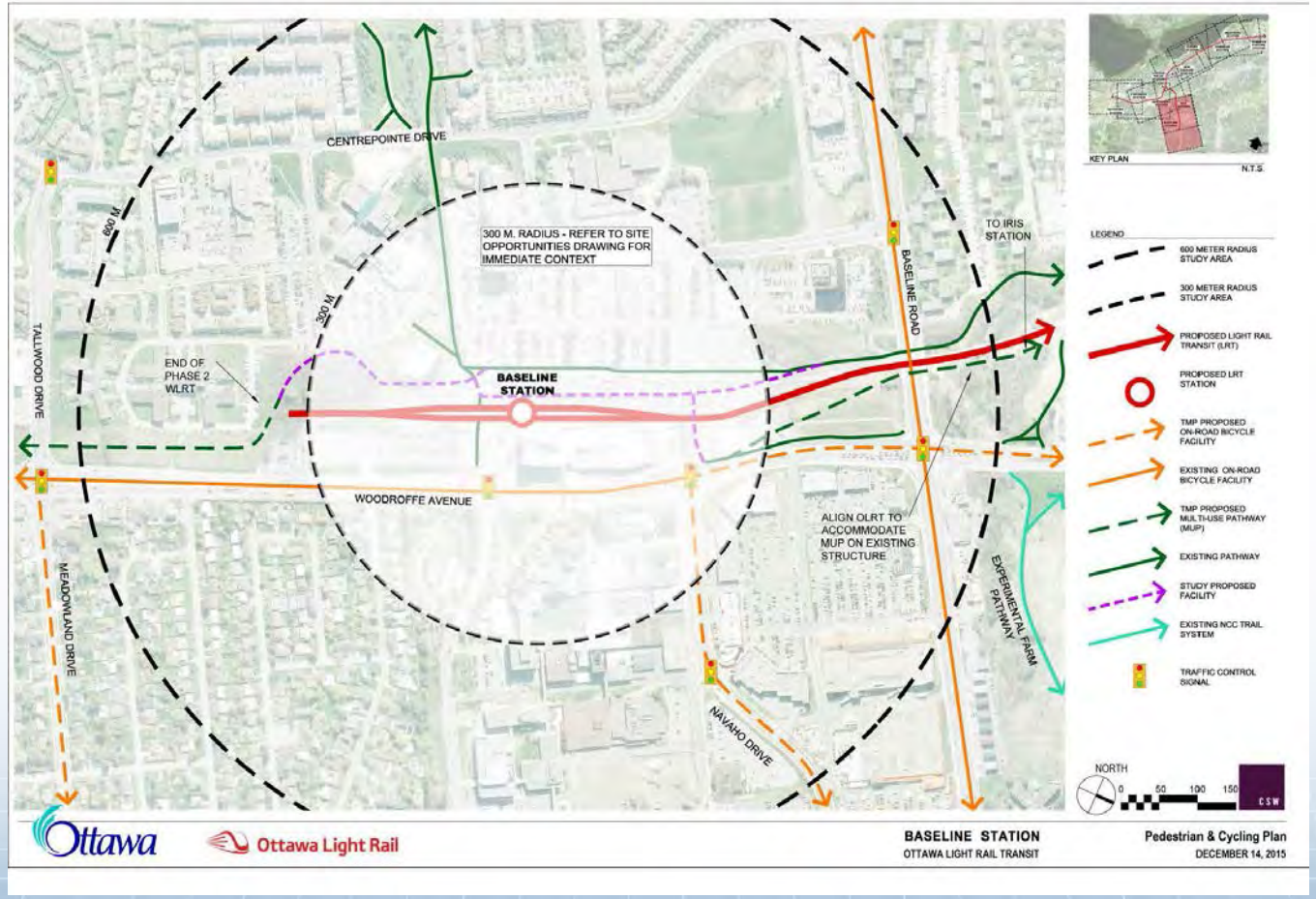
- Choix de l'option privilégiée (hiver 2017)
- Préparation du rapport d'évaluation environnementale de portée générale (hiver 2017)
- Approbation du Comité sur l'environnement et du Conseil municipal (printemps 2017)
- Examen public de 30 jours du rapport d'évaluation environnementale de portée générale (printemps 2017)
- Conception détaillée (2017)
- Construction (2018-2019)

# Questions?

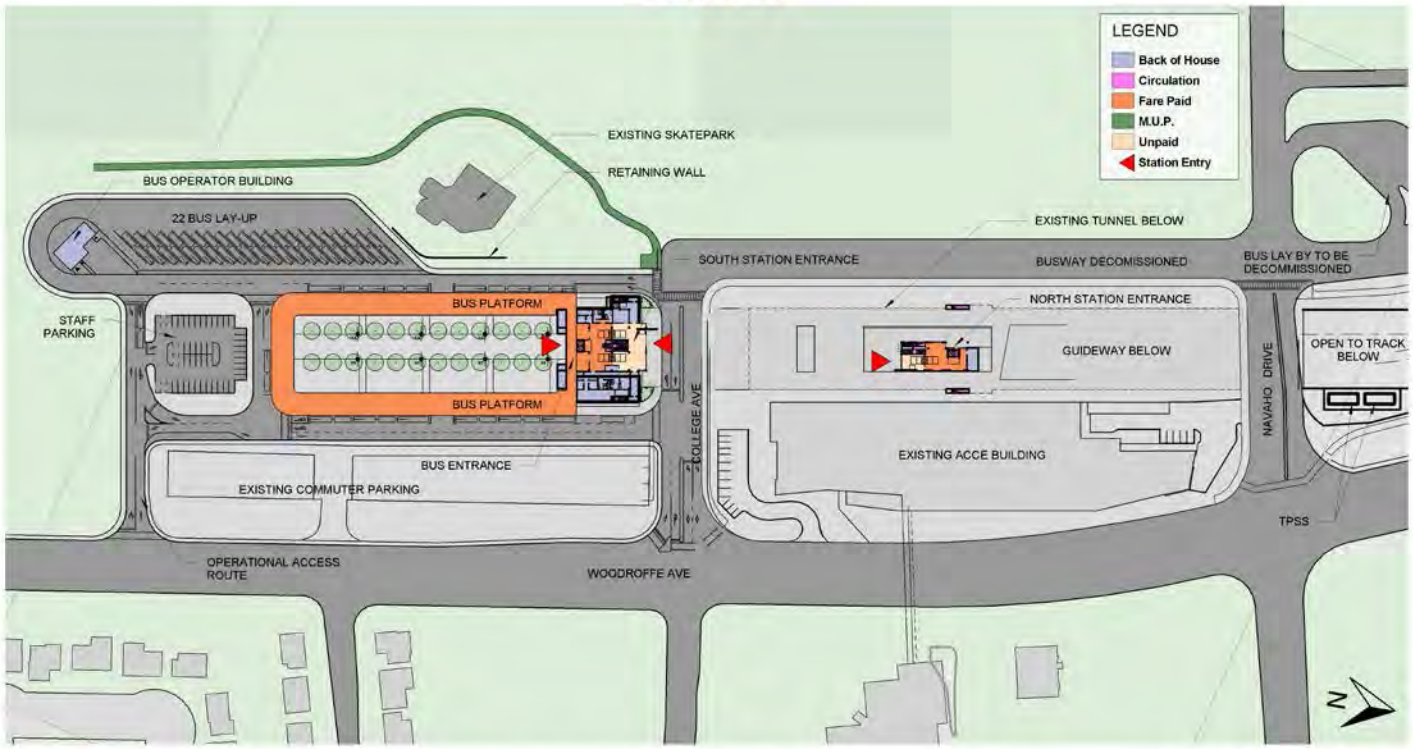
# Connectivité de la station Baseline



# Connectivité de la station Baseline

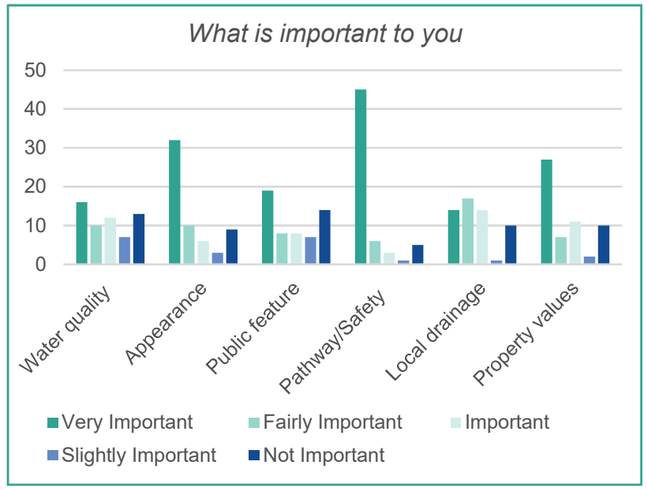


# Configuration de la station Baseline



## *Comments and Concerns to Date*

| Comments and Concerns | Response |
|---|---|
| **Background Information and Decision Making Process**<br>Justification for the pond and its proposed location | This project is following through on the recommendations from the SWM Retrofit Study (2011) and Feasibility Study (2015), which describe the purpose, the stormwater management alternatives, and the evaluation of the alternatives, and are available for review at this link: http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html |
| **Consultation and Notification**<br>Insufficient and inadequate notification to date | In response to the comments received from the Online Consultation, this public meeting is being held to provide additional information and respond further to comments and concerns. All those on the study mailing list and all properties directly abutting the proposed site of the pond were directly notified in addition to ads placed in local newspapers. |
| **Recreation**<br>Protection and enhancement of pathways for pedestrians and cyclists<br>Opportunity for complementary community uses | When completed, pedestrian pathways will be incorporated and connected to City of Ottawa pathway and NCC Capital Pathway networks. Complementary community uses may be considered at the detailed design stage. |
| **Natural Environment and Creek Health**<br>Enhance the natural habitat for native wildlife and vegetation | The proposed options have taken into account the protection and enhancement of the creek. Landscaping will incorporate native species and provide natural greenspace and habitat. |
| **Safety, Human Health and Comfort**<br>Undesirable byproducts of stagnant water<br>Risks associated with an unsupervised body of water and the proximity to vulnerable populations | The pond will provide sufficient water movement (due to wind activity as well as continuous flow from a large inlet storm sewer) to discourage mosquitoes and avoid excessive odours. Safety must always be addressed in any stormwater management pond that the City constructs. Typical approaches include clear signage at key locations regarding the function of the pond and the use of plantings to actively discourage access to the open water. Ponds are also provided with "gentle" side slopes near and below the water surface. In a worst case scenario, if someone does slip and fall into the water, the flatness of the slope and the shallow water depths near the edge of the pond ensure one can readily climb out. |
| **Pond Operation and Drainage**<br>Concern that existing drainage issues will worsen<br>Maintenance of pond | The site will be re-graded and drainage will not negatively impact adjacent properties. The City will be maintain the facility and ensure that it functions properly. |
| **Property and Residences**<br>Decreased property values<br>Concern that litter will worsen | Based upon experience with SWM ponds throughout the City, the environmental, aesthetic, and recreational benefits of these types of facilities have made them valued community assets. |




**Summary of results for online questionnaire (results received to December 15, 2016)**

## *Next Steps*

- Choose the preferred option (Winter 2017)
- Prepare the Class EA report (Winter 2017)
- Environment Committee and City Council approvals (Spring 2017)
- 30-day public review of Class EA report (Spring 2017)
- Detailed design (2017)
- Construction (2018 / 2019)

Information about this project can also be found on the City of Ottawa's website: Ottawa.ca/baselinewoodroffepond

***Responses to the online questionnaire at this link will be received until January 16, 2017.***

For further information about the project or to add your name to the project mailing list, please contact:

**Darlene Conway, P. Eng.**
**Senior Project Manager, Asset Management**
**Planning, Infrastructure and Economic Development Dept.**
**City of Ottawa**
**110 Laurier Avenue West, 3rd Floor**
**Ottawa, ON K1P 1J1**
**613-580-2424 ext. 27611**
**Darlene.Conway@ottawa.ca**



# Baseline and Woodroffe Stormwater Management Pond Environmental Assessment Study

## *Welcome*

Welcome to the Public Meeting for the Baseline and Woodroffe Stormwater Management Pond Environmental Assessment (EA).

A stormwater management pond is proposed at the northeast corner of Baseline Road and Woodroffe Avenue to improve water quality, reduce erosion and lessen the risk of flooding along Pinecrest Creek.

Tonight you will have the opportunity to learn about and comment on:

- Project and background
- Environmental assessment process
- Existing conditions, constraints and opportunities
- Evaluation of pond options
- Comments and concerns to date (in response to the Online Consultation)
- Next steps

Representatives from the City of Ottawa and the Project Team are here to answer your questions.

## *Project and Background*

A stormwater management pond was initially recommended in the Pinecrest Creek/Westboro Stormwater Management Retrofit Study (2011) and underwent further assessment in the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (2015). Both studies can be viewed at this link: http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html

The proposed pond is located on land owned by the National Capital Commission (NCC).

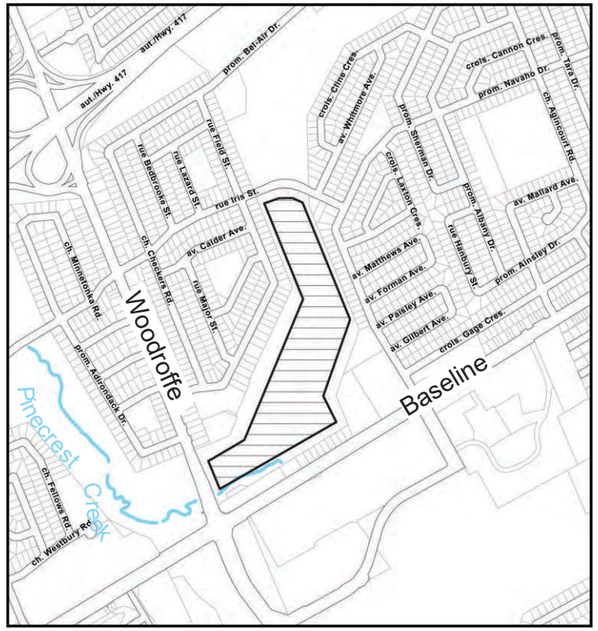
## *Environmental Assessment Process*

This project is being planned under Schedule B of the Municipal Class Environmental Assessment (Class EA). The Class EA process includes the following steps:

- Identify the existing conditions and constraints
- Consider previous studies
- Confirm the preferred option for the stormwater management pond
- Document the process

The Class EA will identify a preferred option and functional design for the proposed pond which will be presented to City Council for approval.

Interested persons can provide comments throughout the Class EA process. Upon completion of this study, it will be made available for public review and comment. A Notice of Study Completion will be published at that time.




## *Existing Conditions, Constraints and Opportunities*

The following aspects of the site were reviewed as part of the ongoing Class EA process and the previously completed studies:

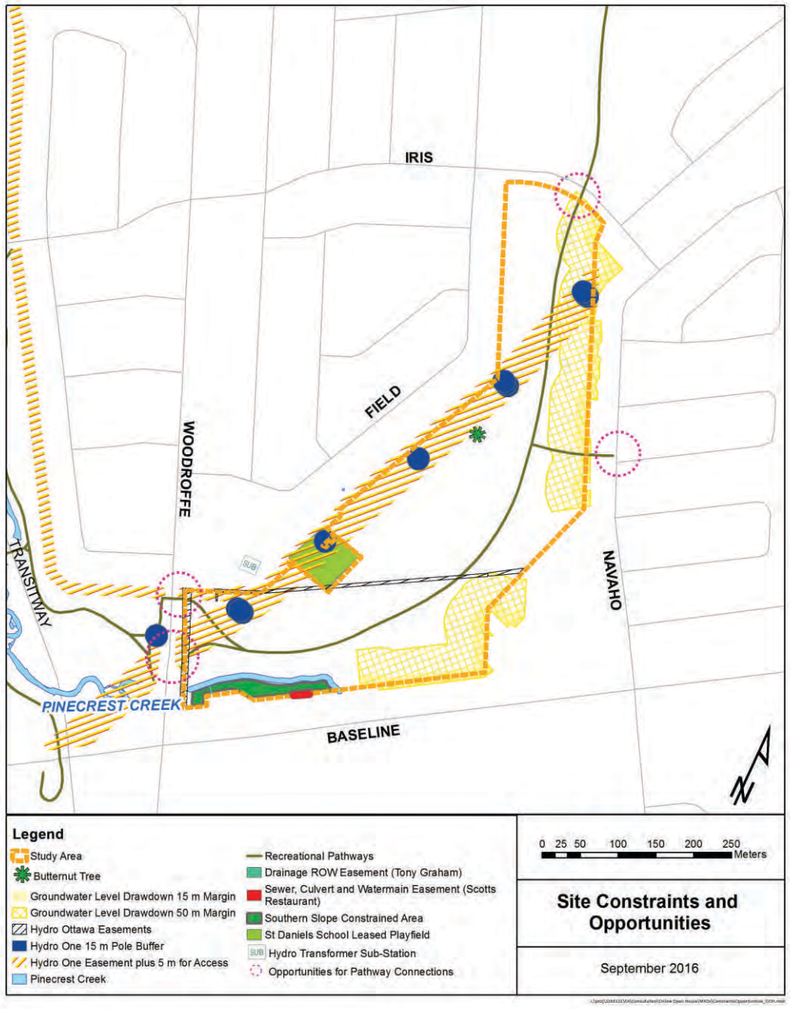
- Subsurface conditions (bedrock, surficial geology, groundwater)
- Environmental contamination
- Watercourses
- Fluvial geomorphology
- Fish and aquatic habitat
- Wetlands and Areas of Natural and Scientific Interest (ANSI)
- Natural terrestrial vegetation
- Wildlife and habitat
- Species at risk and critical habitat
- Aboriginal land claims
- Cultural heritage/archaeology
- Public land ownership
- Existing land use
- Infrastructure networks
- Recreation and pedestrian/cycling routes

*Public Meeting* *January 9, 2017*

## *Existing Conditions, Constraints and Opportunities (continued)*

The following elements are within or adjacent to the site, and are considered either a constraint or an opportunity:

- A butternut tree centrally located in the mid-western region of the site
- 15 and 50 metre wide zones along the east and southeast boundaries of the site that may experience groundwater level drawdown when the pond is constructed
- A Hydro Ottawa easement that bisects the southern portion of the site
- A Hydro One easement and associated poles located along the western boundary of the site
- Pinecrest Creek crosses under Baseline Road to enter and then exit the site under Woodroffe Avenue at the southwest corner of the site
- A recreational pathway runs through the entire site in a north-south direction, and connects to the neighbourhood east of Navaho Drive, and to Woodroffe Avenue and the Transitway west of the site
- Opportunities for future pathway connections in addition to maintaining current connections
- A small drainage right-of-way easement (in favour of Tony Graham) at the southeast corner of the site
- A sewer, culvert, and watermain easement (in favour of Scotts Restaurant) along the southern boundary of the site
- A Hydro transformer sub-station located adjacent to the study area, within 3 to 4 metres of the southwest site boundary
- St Daniels School has a leased playing field that extends into the western boundary of the site




## *Evaluation of Pond Options*

The purpose of the Pinecrest Creek/Westboro SWM Retrofit Study (2011) was to identify a long-term plan to improve water quality in the Creek and Ottawa River and reduce erosion and flooding in the Creek.

In addition to a range of other stormwater management measures, the 2011 SWM Retrofit Study recommended that an end-of-pipe facility (stormwater management pond) be constructed on NCC property at the northeast corner of Baseline Road and Woodroffe Avenue.

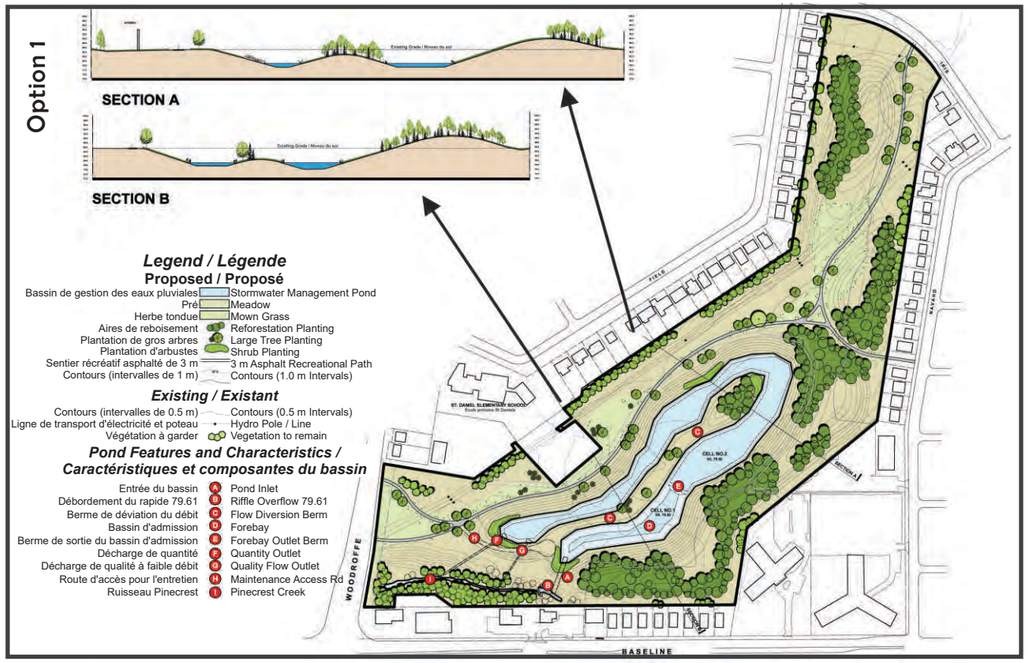
Through the subsequent 2015 Feasibility Study, the requirements for the proposed stormwater management pond were refined and two conceptual designs (Option 1 and Option 2) were prepared. The NCC and City of Ottawa reviewed the options and selected Option 1 as their preferred concept.

For the current Class EA study, the existing conditions and constraints and opportunities have been revisited. These elements were then considered in evaluating the options for the stormwater management pond and will influence the final design and construction.

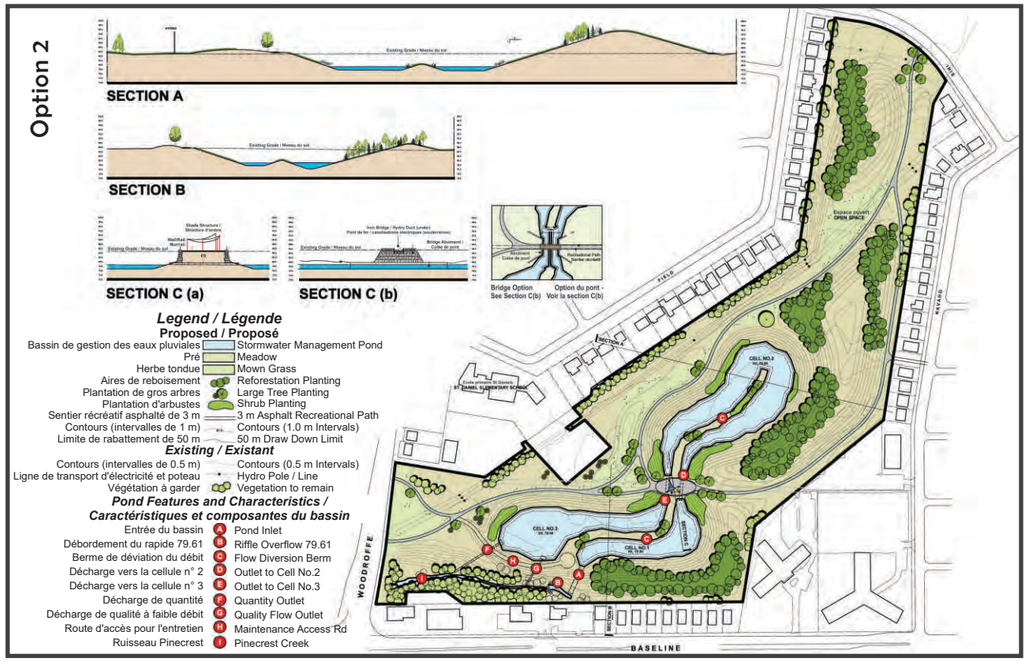


## *Evaluation of Pond Options (continued)*

**Option 1** consists of a forebay and larger treatment cell both with a permanent pool of water. The length of the larger cell extends around an internal peninsula to maximize the pond's length to width ratio. There are landscaped areas around the pond including grassed areas, reforestation planting, and large tree and shrub planting. The recreational pathways are realigned along the edge of the pond and existing pathway connections are maintained. The site is re-graded with pond excavation materials and this provides landforms to buffer the adjacent developments.

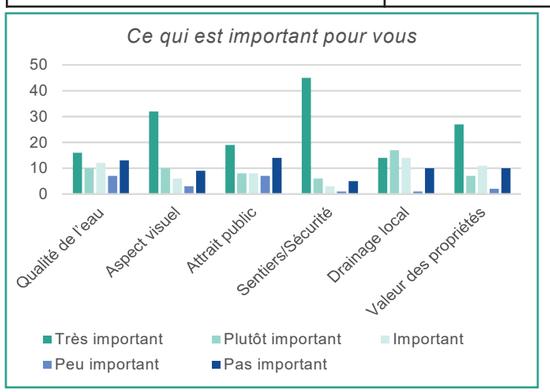



**Option 2** consists of three cells, a forebay and two larger treatment cells, all with a permanent pool of water. The pond cells are separated by open channels or culverts. Similar to Option 1, the pond cells extend around an internal peninsula. Buried Hydro Ottawa cables are accommodated through this separation of the three pond cells. The areas around the pond are landscaped, including grassed areas, reforestation planting, and large tree and shrub planting. The recreational pathways are realigned to cross over the pond near the mid-point via culverts or a footbridge. Vistas are provided for viewing across the pond and informal activity areas are located along the paths. The site is re-graded with pond excavation materials and this provides landforms to buffer the adjacent developments.



## *Résumé des commentaires et des préoccupations recueillis à ce jour*

| Commentaires et préoccupations | Réponse |
|---|---|
| **Information contextuelle et processus décisionnel**<br>Justification du bassin et de l'emplacement proposé | Ce projet fait suite aux recommandations de l'Étude de modernisation de la gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011) et de l'Étude de faisabilité (2015), qui décrivent le but du projet, proposent des options de gestion des eaux pluviales et évaluent ces options. Il est possible de consulter la version anglaise de ces deux études à l'adresse http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html |
| **Consultation et avis**<br>Avis insuffisants et inadéquats jusqu'à présent | En réponse aux commentaires recueillis lors de la consultation en ligne, nous tenons cette réunion publique afin de fournir un supplément d'information et de répondre aux commentaires et préoccupations. Un avis sera envoyé à chaque personne qui s'est inscrite sur la liste d'envoi de l'étude et à chaque propriétaire d'une propriété limitrophe du site proposé pour le bassin de rétention, en plus des annonces qui paraîtront dans les journaux locaux. |
| **Loisirs**<br>Protection et amélioration des sentiers pour les piétons et les cyclistes<br>Utilisations communautaires complémentaires | Une fois terminés, les sentiers pédestres seront intégrés et reliés au réseau de sentiers de la Ville d'Ottawa et au réseau du Sentier de la capitale de la CCN. Des utilisations communautaires complémentaires peuvent être envisagées lors de l'étape de conception détaillée. |
| **Environnement naturel et santé du ruisseau**<br>Amélioration de l'habitat naturel pour la faune et la flore indigènes | Les options proposées tiennent compte de la protection et de l'amélioration du ruisseau. L'aménagement paysager sera en harmonie avec les espèces indigènes et leur fournira un espace et un habitat naturels. |
| **Sécurité, santé et confort des personnes**<br>Effets indésirables de l'eau stagnante<br>Risques associés à un cours d'eau sans supervision et proximité de populations vulnérables | L'eau du bassin sera animée d'un certain mouvement (en raison du vent et du débit continu provenant d'un grand égout pluvial) qui suffira à éloigner les moustiques et à éviter l'émanation excessive d'odeurs. La sécurité est toujours une préoccupation de la Ville lorsqu'elle aménage un bassin de gestion des eaux pluviales. Parmi les mesures habituelles, on trouve l'affichage à des endroits clés de panneaux clairs annonçant la fonction du bassin et la plantation de végétaux comme mesure de dissuasion active pour contrer l'accès à une étendue d'eau libre. Les parois latérales d'un bassin sont légèrement inclinées au-dessus et au-dessous de la surface de l'eau. Si par malheur quelqu'un tombait dans le bassin, la légère inclinaison des parois et la faible profondeur de l'eau sur les berges du bassin lui permettraient d'en ressortir facilement. |
| **Fonctionnement et drainage du bassin**<br>Préoccupation concernant l'aggravation des problèmes de drainage actuels<br>Entretien du bassin | Le site sera renivelé et le drainage n'aura pas d'impact néfaste sur les propriétés adjacentes. La Ville est responsable de l'entretien régulier de l'installation et veille à son bon fonctionnement. |
| **Propriété et résidences**<br>Diminution de la valeur des propriétés<br>Préoccupation concernant l'aggravation de la pollution | À la lumière de l'expérience avec les autres bassins de rétention aménagés ailleurs dans la ville, les avantages environnementaux, esthétiques et récréatifs de ce type d'installations en font des biens communautaires estimés. |




**Résumé des résultats du questionnaire en ligne (résultats reçus jusqu'au 15 décembre 2016)**

Vous trouverez d'autres renseignements au sujet de ce projet sur le site de la Ville d'Ottawa : ottawa.ca/bassinbaselinewoodroffe

***Il sera possible de répondre au questionnaire en ligne à partir de ce lien jusqu'au 16 janvier 2017.***

Pour obtenir tout autre renseignement au sujet du projet ou pour vous inscrire à la liste d'envoi, veuillez communiquer avec :

**Darlene Conway, ing.**
**Gestionnaire principale de projet, Gestion des biens**
**Direction générale de la planification, de l'infrastructure et du développement économique**
**Ville d'Ottawa**
**110, avenue Laurier Ouest, 3e étage**
**Ottawa, ON K1P 1J1**
**613-580-2424, poste 27611**
**Darlene.Conway@ottawa.ca**



# Bassin de gestion des eaux pluviales de Baseline et Woodroffe
# Évaluation evironnementale

## *Bienvenue*

Bienvenue à la séance publique portant sur l'évaluation environnementale (ÉE) du bassin de rétention des eaux pluviales Baseline et Woodroffe.

L'aménagement d'un bassin de gestion des eaux pluviales à l'angle nord-est du chemin Baseline et de l'avenue Woodroffe a été proposé en vue d'optimiser la qualité de l'eau, de réduire l'érosion et de diminuer le risque d'inondations aux abords du ruisseau Pinecrest.

Ce soir, vous aurez la chance de vous renseigner et de vous prononcer sur :

- La nature et le contexte du projet
- Le processus d'évaluation environnementale
- Les conditions actuelles, contraintes et possibilités
- L'évaluation des options d'aménagement du bassin
- Les commentaires et les préoccupations recueillis à ce jour (lors de la consultation en ligne)
- Les prochaines étapes

Des représentants de la Ville d'Ottawa et de l'équipe chargée du projet sont ici pour répondre à vos questions.

## *La nature et le contexte du projet*

L'aménagement d'un tel bassin avait été initialement recommandé dans l'Étude de modernisation de la gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011) et avait fait l'objet d'une nouvelle évaluation dans le cadre de l'Étude de faisabilité pour l'installation de gestion des eaux pluviales de surface à l'angle du chemin Baseline et de l'avenue Woodroffe (2015). Il est possible de consulter ces deux études en cliquant sur le lien suivant (en anglais) : http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html

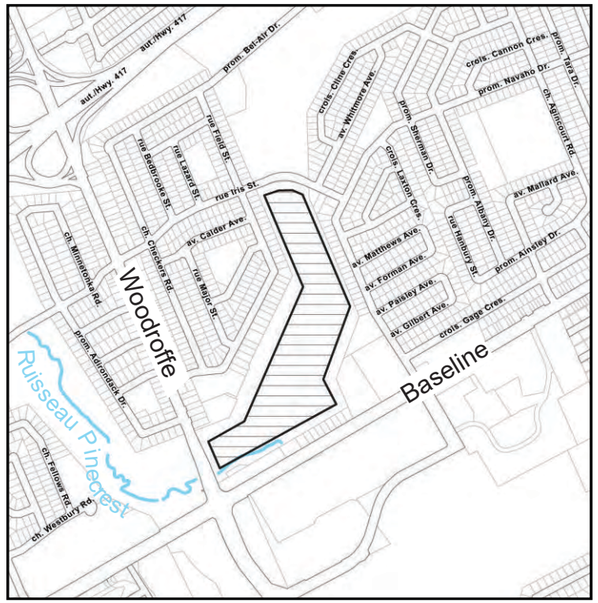
Le bassin proposé est situé sur une propriété appartenant à la Commission de la capitale nationale (CCN).

## *Processus d'évaluation environnementale*

Ce projet est mené en vertu de l'annexe B de l'évaluation environnementale municipale de portée générale. Le processus d'ÉE de portée générale comporte les étapes suivantes :

- déterminer les conditions actuelles et les contraintes;
- tenir compte des études antérieures;
- confirmer l'option privilégiée pour le bassin de gestion des eaux pluviales;
- documenter le processus.

L'ÉE de portée générale permettra de définir l'option et la conception fonctionnelle qui conviennent le mieux pour l'aménagement du bassin proposé. Elles seront soumises à l'approbation du Conseil municipal.




Les personnes intéressées peuvent transmettre leurs commentaires en tout temps durant le processus d'ÉE de portée générale.

Une fois l'étude terminée, elle sera rendue publique pour que la population puisse en prendre connaissance et la commenter. Un avis de fin d'étude sera publié à ce moment.

## *Conditions actuelles, contraintes et possibilités*

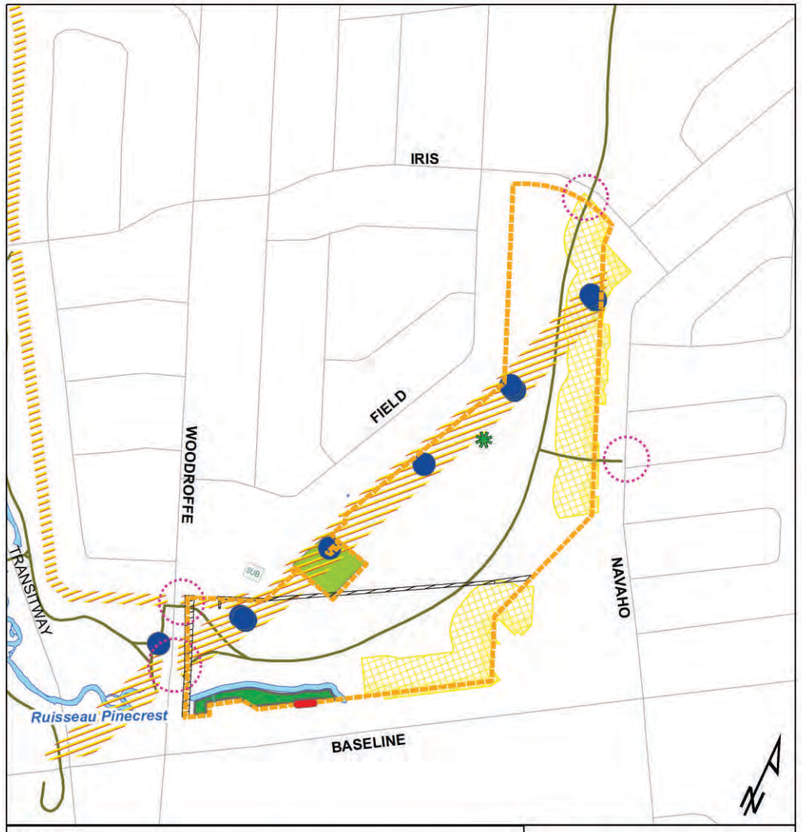
Les aspects suivants ont été étudiés durant le processus d'ÉE de portée générale et durant les études antérieures :

- conditions en sous-surface (sous-sol rocheux, géologie de surface, eau souterraine);
- contamination environnementale;
- cours d'eau;
- géomorphologie fluviale;
- poissons et milieu aquatique;
- zones humides et Zones d'intérêt naturel et scientifique (ZINS);
- végétation terrestre naturelle;
- faune et habitats;
- espèces en péril et habitats essentiels;
- revendications territoriales des Autochtones;
- patrimoine culturel et archéologie;
- propriété des terrains publics;
- utilisation actuelle du sol;
- réseaux d'infrastructures;
- pistes récréatives, piétonnes et cyclables.

## ***Conditions actuelles, contraintes et possibilités (continué)***

Les éléments suivants se trouvent sur le site même ou à proximité et sont considérés soit comme une contrainte, soit comme une possibilité d'aménagement :

- un noyer cendré est situé au milieu de la zone centre-ouest du site;
- la construction du bassin pourrait entraîner un rabattement du niveau des eaux souterraines dans des zones de 15 mètres et de 50 mètres de large le long des limites est et sud-est du site;
- une servitude d'Hydro Ottawa traverse la partie sud du site;
- une servitude d'Hydro One et des poteaux sont situés le long de la limite ouest du site;
- le ruisseau Pinecrest entre sur le site sous le chemin Baseline et en ressort sous l'avenue Woodroffe, à l'angle sud-ouest du site;
- un sentier récréatif traverse l'ensemble du site en direction nord-sud et assure la liaison avec le quartier à l'est de la promenade Navaho et avec l'avenue Woodroffe et le Transitway à l'ouest du site;
- il serait possible d'aménager de nouvelles liaisons avec les sentiers et d'entretenir les liaisons actuelles;
- une petite servitude de drainage (au bénéfice de Tony Graham) se trouve dans le coin sud-est du site;
- une servitude d'égout, de ponceau et de conduites d'eau principales (au bénéfice de Scotts Restaurant) est située le long de la limite sud du site;
- une sous-station de transformation électrique est adjacente au secteur à l'étude, à moins de 3 à 4 mètres de la limite sud-ouest du site;
- l'école St. Daniels loue un terrain de jeu qui s'avance dans la limite ouest du site.




## ***Évaluation des options d'aménagement du bassin***

L'objet de l'Étude de modernisation de la gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011) était d'élaborer un plan à long terme pour optimiser la qualité de l'eau du ruisseau et de la rivière des Outaouais et pour réduire l'érosion et les inondations aux abords du ruisseau.

Outre la mise en œuvre des meilleures pratiques de gestion des eaux pluviales, l'Étude de modernisation de 2011 recommandait qu'une installation au point de rejet (bassin de gestion des eaux pluviales) soit construite sur la propriété de la CCN à l'angle nord-est du chemin Baseline et de l'avenue Woodroffe.

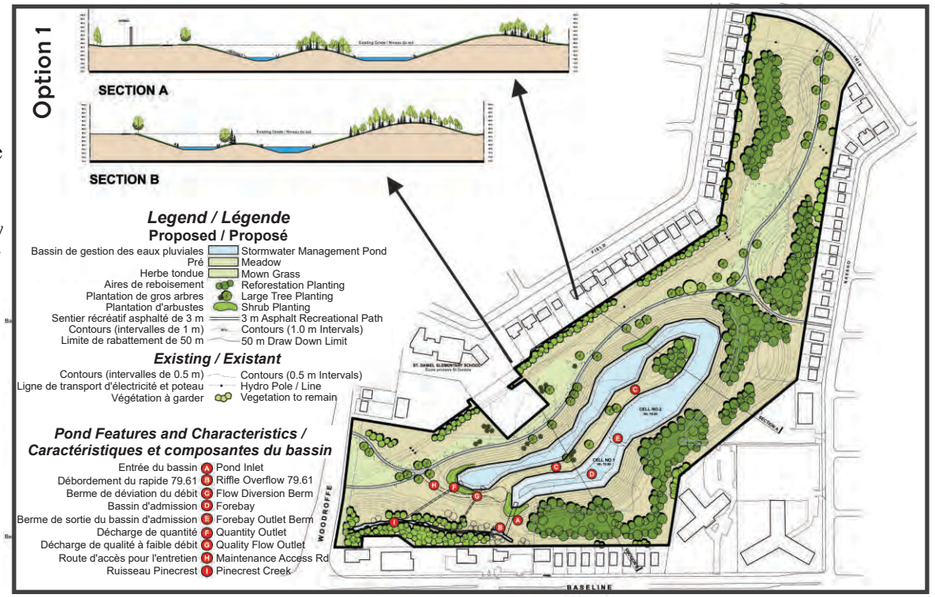
Par le biais de l'Étude de faisabilité de 2015, les exigences pour le bassin de gestion des eaux pluviales proposé ont été précisées, et deux conceptions (Option 1 et Option 2) ont été élaborées. La CCN et la Ville d'Ottawa ont examinés les options et ont choisis l'Option 1 comme modèle privilégié.

Pour les besoins de l'étude d'ÉE de portée générale, les conditions actuelles, les contraintes et les possibilités ont été réexaminées. Elles ont ensuite été prises en compte lors de l'évaluation des options d'aménagement du bassin de gestion des eaux pluviales et influeront sur sa conception finale et sa construction.



## ***Évaluation des options d'aménagement du bassin (continué)***

**L'Option 1** consiste en un bassin d'admission et une plus grande cellule de traitement, les deux comportant un bassin permanent. La longueur de la plus grande cellule se prolonge autour d'une péninsule interne afin de maximiser le rapport longueur/largeur du bassin. Il y a des espaces paysagers autour du bassin, y compris des zones gazonnées, des aires de reboisement, de gros arbres et des arbustes. Le tracé des sentiers récréatifs est modifié pour longer le bassin et les liens existants sont maintenus. Le site est renivelé avec les matériaux d'excavation du bassin et cela donne du relief pour protéger les aménagements adjacents.




**L'Option 2** consiste en trois cellules, un bassin d'admission et deux plus grandes cellules de traitement, comportant tous un bassin permanent. Les cellules du bassin sont séparées par des canaux ou des ponceaux ouverts. Comme dans l'Option 1, les cellules du bassin se prolongent autour d'une péninsule interne. La séparation de ces trois cellules du bassin permettra d'enfouir les câbles d'Hydro Ottawa. Il y a des espaces paysagers autour du bassin, y compris des zones gazonnées, des aires de reboisement, de gros arbres et des arbustes. Le tracé des sentiers récréatifs est modifié pour traverser le bassin près du point central par l'entremise de ponceaux ou d'une passerelle. Des endroits sont aménagés pour permettre une vue dégagée sur le bassin, et des zones d'activités informelles sont situées le long des sentiers. Le site est renivelé avec les matériaux d'excavation du bassin et cela donne du relief pour protéger les aménagements adjacents.


## ***Prochaines étapes***

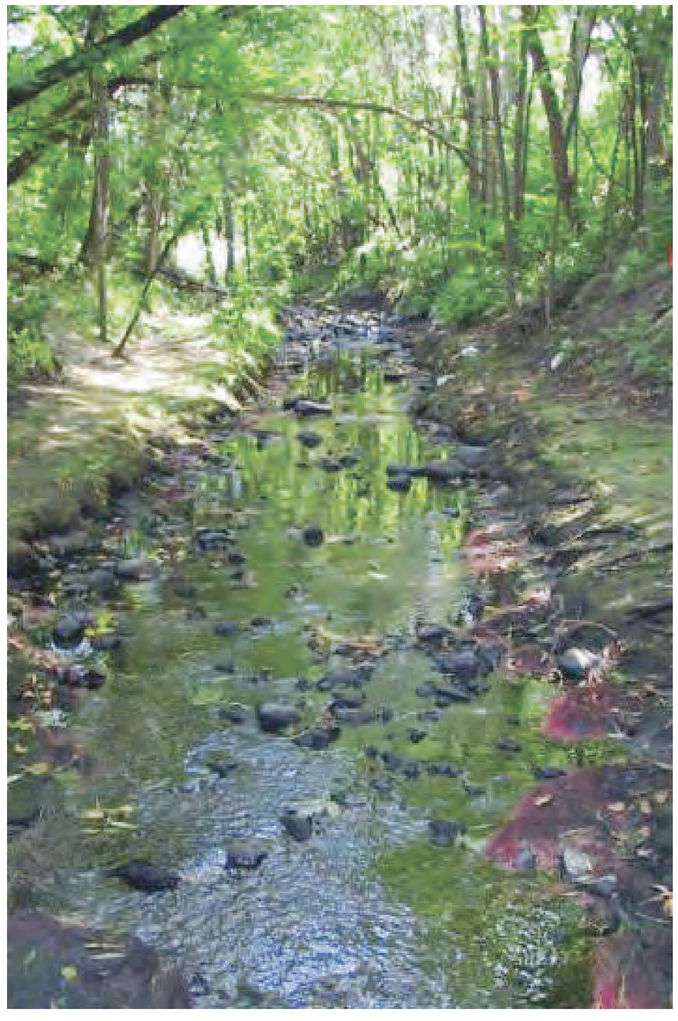
- Choix de l'option privilégiée (hiver 2017)
- Préparation du rapport d'ÉE de portée générale (hiver 2017)
- Approbation du Comité sur l'environnement et du Conseil municipal (printemps 2017)
- Examen public de 30 jours du rapport d'ÉE de portée générale (printemps 2017)
- Conception détaillée (2017)
- Construction (2018-2019)

# Welcome

Baseline and Woodroffe Stormwater Management Pond Environmental Assessment Study

Public Meeting

*January 9, 2017*



# Bienvenue

Bassin de gestion des eaux pluviales de Baseline et Woodroffe évaluation environnementale de portée générale

Séance publique

*9 janvier 2017*

# The Project

**The City of Ottawa has initiated a Municipal Class Environmental Assessment (Class EA) for a Stormwater Management (SWM) Pond.**

- **Northeast corner of Baseline Road and Woodroffe Avenue**
- **Initially recommended in the Pinecrest Creek/Westboro Stormwater Management Retrofit Study (2011)**
- **Underwent further assessment in the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue (2015)**

# Le projet

**La Ville d'Ottawa a entrepris une évaluation environnementale (ÉE) municipale de portée générale en vue d'aménager un bassin de gestion des eaux pluviales (GEP).**

- **L'angle nord-est du chemin Baseline et de l'avenue Woodroffe**
- **Recommendait au départ, l'étude sur la rénovation de l'installation de gestion des eaux pluviales du ruisseau Pinecrest/Westboro (2011)**
- **L'objet d'une nouvelle évaluation dans le cadre de l'étude de faisabilité pour l'installation de gestion des eaux pluviales de surface du chemin Baseline et de l'avenue Woodroffe (2015)**

# Process

**Schedule B Municipal Class Environmental Assessment, requiring:**

- **Identification of the existing conditions and constraints**
- **Consideration of the previous studies**
- **Confirmation and assessment of the options for the SWM pond**
- **Documentation of the process**

**The Class EA will identify a preferred option and functional design for the SWM pond.**

# Processus

**L'Annexe B du document d'ÉE municipale de portée générale, qui s'exige:**

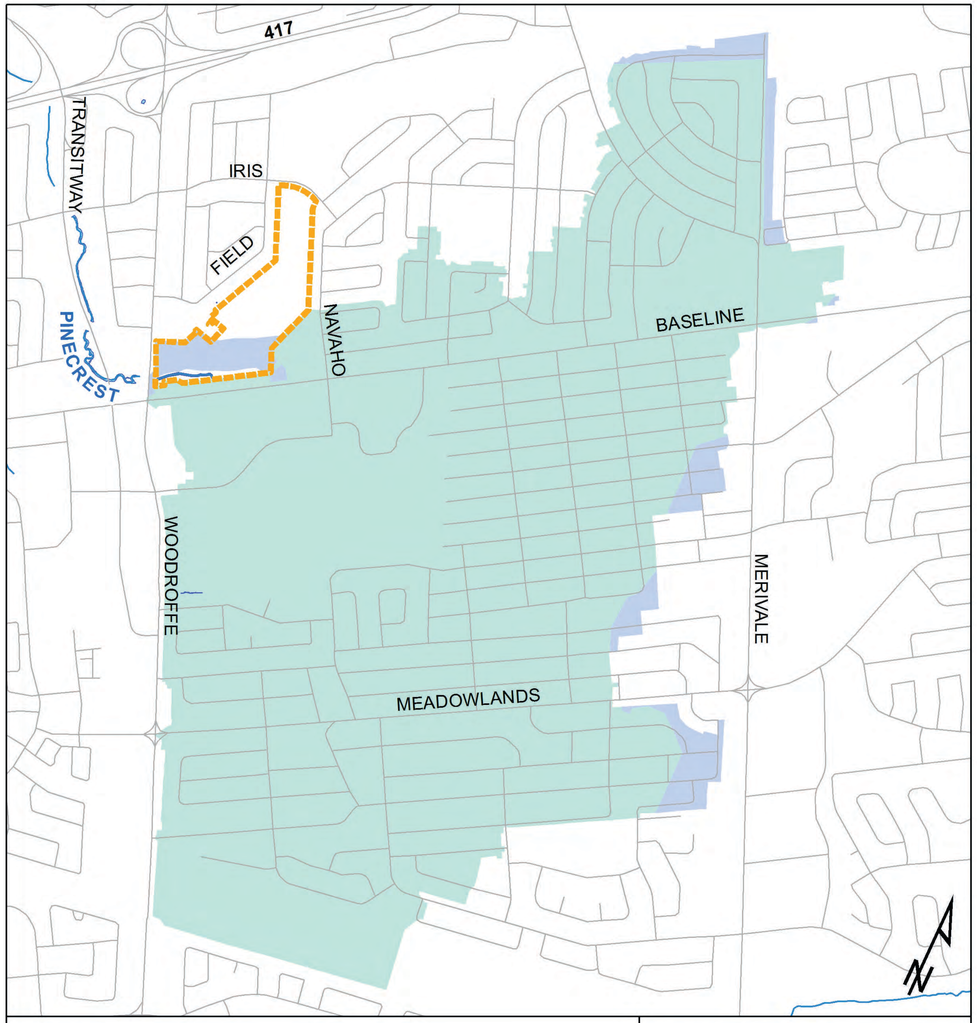
- **Identification des conditions actuelles et les contraintes**
- **Tenir compte des études antérieures**
- **Confirmation et l'évaluation des options pour le bassin de GEP**
- **Documentation du processus**

**L'ÉE de portée générale permettra de définir une option et une conception fonctionnelle privilégiées pour le bassin de GEP.**

Baseline and Woodroffe Stormwater Management Pond Environmental Assessment

Bassin de gestion des eaux pluviales de Baseline et Woodroffe Évaluation environnementale

# Drainage Area




**Legend**

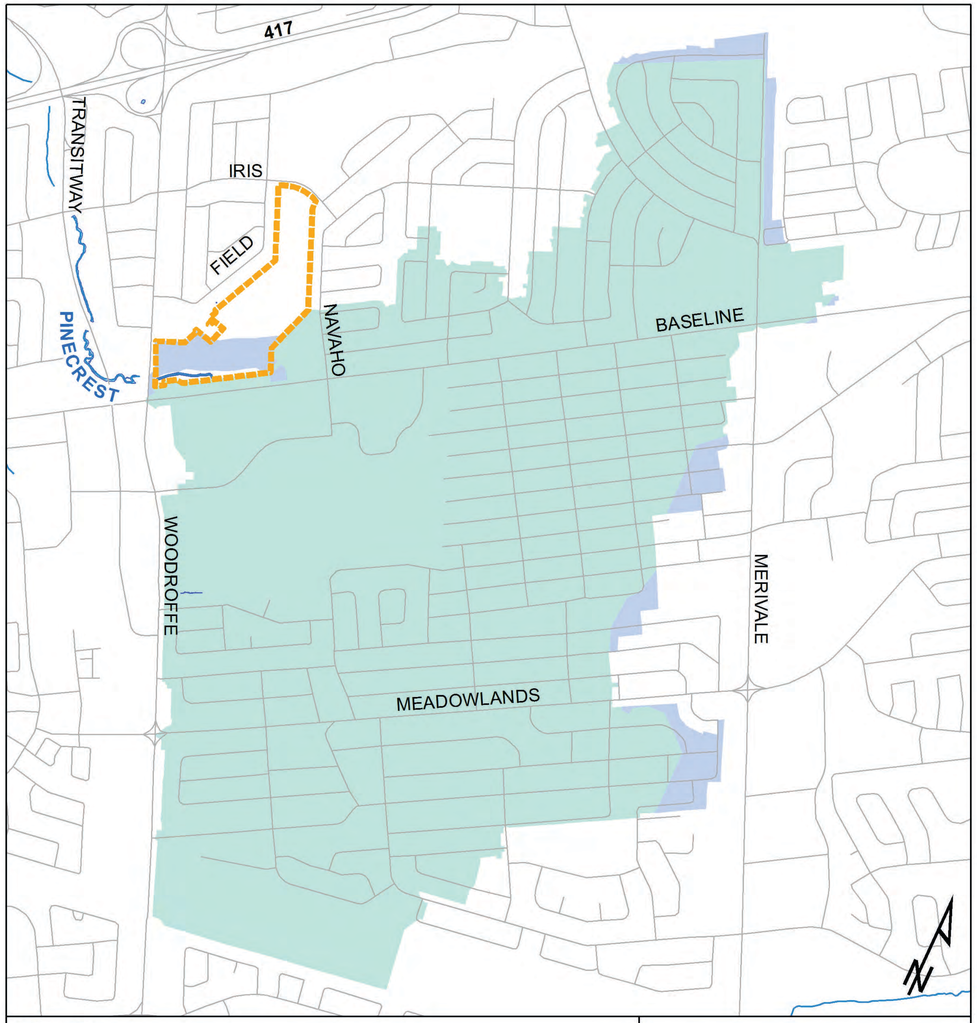
- Storm Sewer Drainage Area to Proposed SWM Pond
- Major Storm Drainage Area
- Study Area
- Pinecrest Creek
- Road Network

0 75 150 300 450 600 750 Meters

**Drainage Area**

August 2016

# Zone de Drainage




**Légende**

- Zone de drainage de l'égout pluvial au bassin de gestion des eaux pluviales proposé
- Zone de drainage primaire des eaux pluviales
- Secteur à l'étude
- Ruisseau Pinecrest
- Réseau routier

0 75 150 300 450 600 750 Mètres

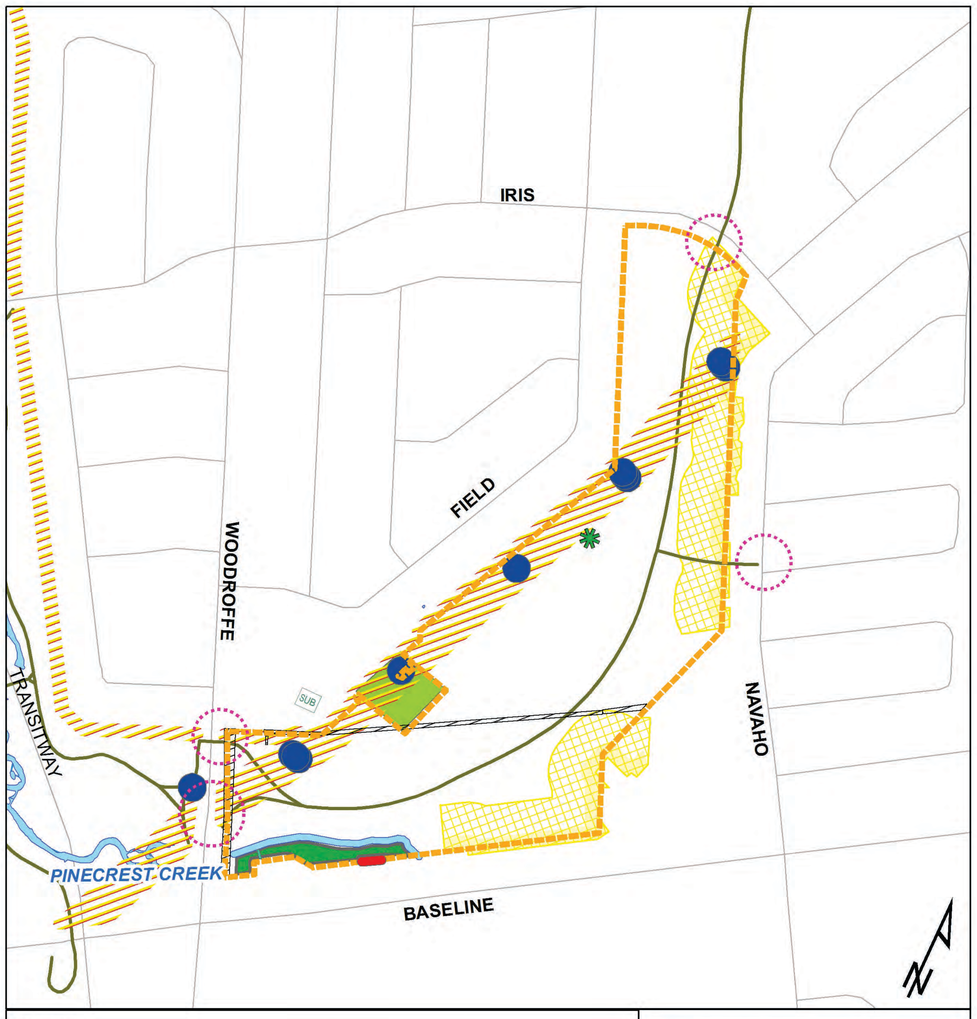
**Zone de drainage**

Août 2016

Baseline and Woodroffe Stormwater Management Pond Environmental Assessment

Bassin de gestion des eaux pluviales de Baseline et Woodroffe Évaluation environnementale

# Site Constraints and Opportunities




**Legend**

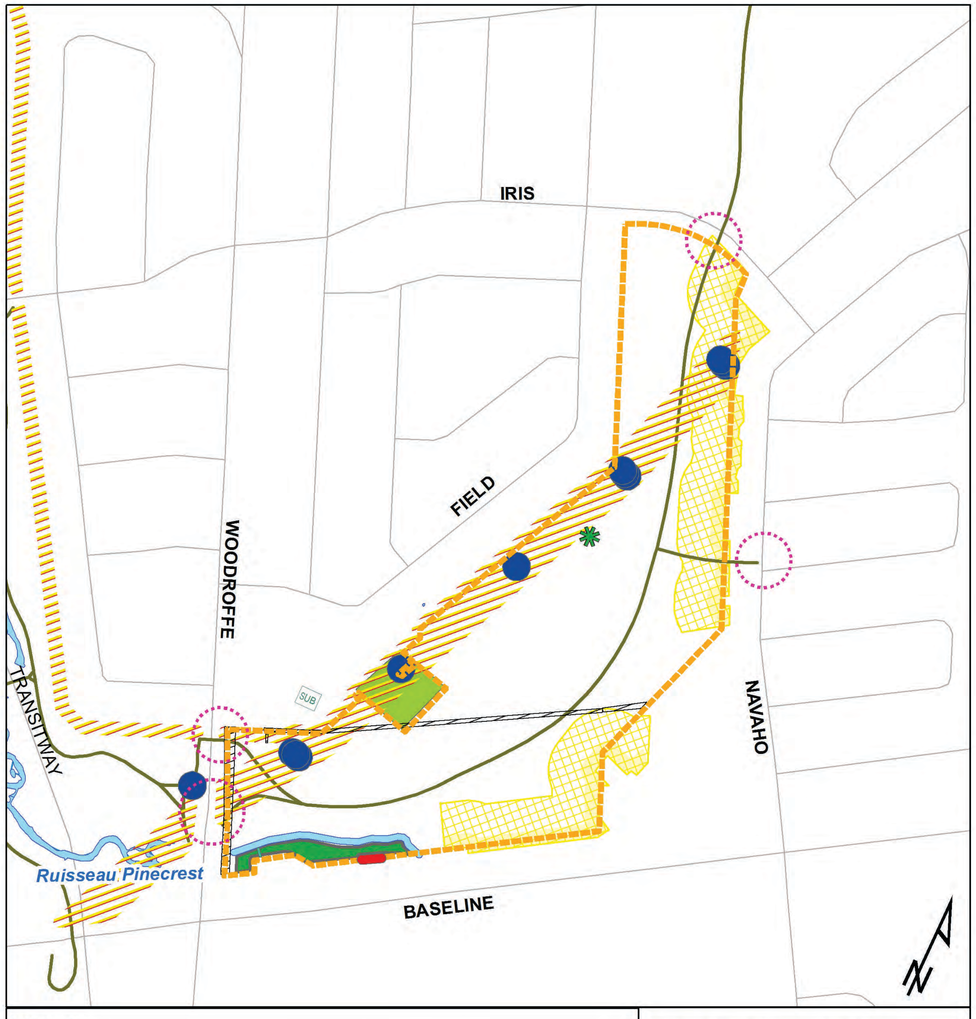
- Study Area
- Butternut Tree
- Groundwater Level Drawdown 15 m Margin
- Groundwater Level Drawdown 50 m Margin
- Hydro Ottawa Easements
- Hydro One 15 m Pole Buffer
- Hydro One Easement plus 5 m for Access
- Pinecrest Creek
- Recreational Pathways
- Drainage ROW Easement (Tony Graham)
- Sewer, Culvert and Watermain Easement (Scotts Restaurant)
- Southern Slope Constrained Area
- St Daniels School Leased Playfield
- SUB Hydro Transformer Sub-Station
- Opportunities for Pathway Connections

0 25 50 100 150 200 250 Meters

**Site Constraints and Opportunities**

September 2016

# Contraintes et possibilités du site




**Légende**

- Secteur à l'étude
- Noyer cendré
- Rabattement du niveau des eaux souterraines - marge de 15 m
- Rabattement du niveau des eaux souterraines - marge de 50 m
- Servitude d'Hydro Ottawa
- Périmètre des 15 m autour des poteaux d'Hydro
- Servitude d'Hydro One et 5 m pour l'accès
- Ruisseau Pinecrest
- Sentiers récréatifs
- Servitude de drainage (Tony Graham)
- Servitude d'égout, de ponceau et de conduites d'eau principales (Scotts Restaurant)
- Secteur restreint du versant sud
- Terrain de jeu loué par l'école St Daniels
- SUB Sous-station de transformation électrique
- Possibilités de liens vers des sentiers

0 25 50 100 150 200 250 Mètres

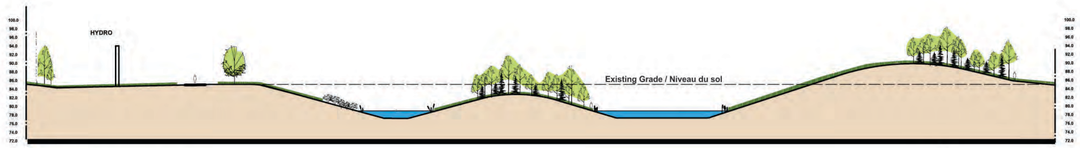
**Contraintes et possibilités du site**

Septembre 2016

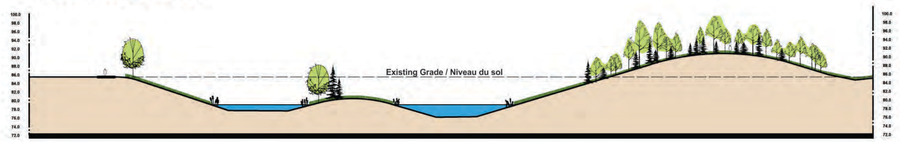
Baseline and Woodroffe Stormwater Management Pond Environmental Assessment

Bassin de gestion des eaux pluviales de Baseline et Woodroffe Évaluation environnementale

# Option 1




SECTION A




SECTION B


## *Legend / Légende*

### Proposed / Proposé

| | |
|---|---|
| Bassin de gestion des eaux pluviales | Stormwater Management Pond |
| Pré | Meadow |
| Herbe tondue | Mown Grass |
| Aires de reboisement | Reforestation Planting |
| Plantation de gros arbres | Large Tree Planting |
| Plantation d'arbustes | Shrub Planting |
| Sentier récréatif asphalté de 3 m | 3 m Asphalt Recreational Path |
| Contours (intervalles de 1 m) | Contours (1.0 m Intervals) |
| Limite de rabattement de 50 m | 50 m Draw Down Limit |

### *Existing / Existant*

| | |
|---|---|
| Contours (intervalles de 0.5 m) | Contours (0.5 m Intervals) |
| Ligne de transport d'électricité et poteau | Hydro Pole / Line |
| Végétation à garder | Vegetation to remain |

### *Pond Features / Components*
### *Caractéristiques et composantes du bassin*

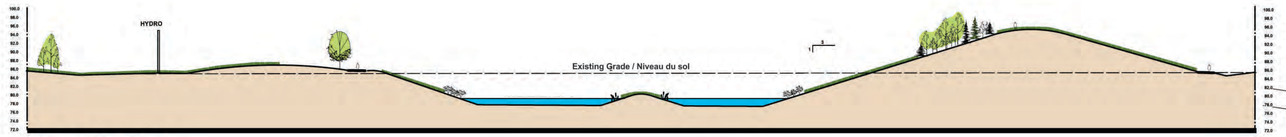
| | | |
|---|---|---|
| Entrée du bassin | A | Pond Inlet |
| Débordement du rapide 79.61 | B | Riffle Overflow 79.61 |
| Berme de déviation du débit | C | Flow Diversion Berm |
| Bassin d'admission | D | Forebay |
| Berme de sortie du bassin d'admission | E | Forebay Outlet Berm |
| Décharge de quantité | F | Quantity Outlet |
| Décharge de qualité à faible débit | G | Quality Flow Outlet |
| Route d'accès pour l'entretien | H | Maintenance Access Road |
| Ruisseau Pinecrest | I | Pinecrest Creek |

**Option 1**

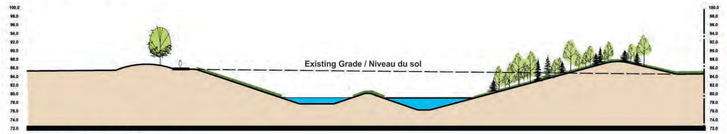
*Originally prepared for the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue, 2015*

*Préparé à l'origine pour l'Étude de faisabilité pour l'installation de gestion des eaux pluviales de surface du chemin Baseline et de l'avenue Woodroffe, 2015*

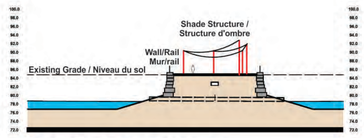
# Option 2



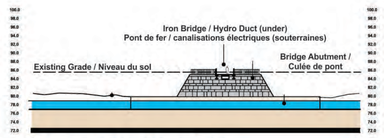

**SECTION A**




**SECTION B**




**SECTION C (a)**




**SECTION C (b)**




Bridge Option See Section C(b) — Option du pont - Voir la section C(b)

## *Legend / Légende*

### Proposed / Proposé

| | |
|---|---|
| Bassin de gestion des eaux pluviales | Stormwater Management Pond |
| Pré | Meadow |
| Herbe tondue | Mown Grass |
| Aires de reboisement | Reforestation Planting |
| Plantation de gros arbres | Large Tree Planting |
| Plantation d'arbustes | Shrub Planting |
| Sentier récréatif asphalté de 3 m | 3 m Asphalt Recreational Path |
| Contours (intervalles de 1 m) | Contours (1.0 m Intervals) |
| Limite de rabattement de 50 m | 50 m Draw Down Limit |

### *Existing / Existant*

| | |
|---|---|
| Contours (intervalles de 0.5 m) | Contours (0.5 m Intervals) |
| Ligne de transport d'électricité et poteau | Hydro Pole / Line |
| Végétation à garder | Vegetation to remain |

### *Pond Features / Components*
### *Caractéristiques et composantes du bassin*

| | |
|---|---|
| Entrée du bassin | A Pond Inlet |
| Débordement du rapide 79.61 | B Riffle Overflow 79.61 |
| Berme de déviation du débit | C Flow Diversion Berm |
| Décharge vers la cellule n° 2 | D Outlet to Cell No.2 |
| Décharge vers la cellule n° 3 | E Outlet to Cell No.3 |
| Décharge de quantité | F Quantity Outlet |
| Décharge de qualité à faible débit | G Quality Flow Outlet |
| Route d'accès pour l'entretien | H Maintenance Access Road |
| Ruisseau Pinecrest | I Pinecrest Creek |


Option 2

*Originally prepared for the Feasibility Study for a Surface Stormwater Management Facility at Baseline Road and Woodroffe Avenue, 2015*

*Préparé à l'origine pour l'Étude de faisabilité pour l'installation de gestion des eaux pluviales de surface du chemin Baseline et de l'avenue Woodroffe, 2015*

# Next Steps

- Choose the preferred option (Winter 2017)
- Prepare the Class EA report (Winter 2017)
- Environment Committee and City Council approvals (Spring 2017)
- 30-day public review of Class EA Report (Spring 2017)
- Detailed design (2017)
- Construction (2018 / 2019)

# Prochaines Étapes

- Choix de l'option priviligiée (hiver 2017)
- Préparation du rapport d'ÉE de portée générale (hiver 2017)
- Approbation du Comité sur l'environnement et du Conseil municipal (printemps 2017)
- Examen public de 30 jours du rapport d'ÉE de portée générale (printemps 2017)
- Conception détaillée (2017)
- Construction (2018/2019)

# City of Ottawa

## Baseline/Woodroffe Stormwater Management Pond Class Environmental Assessment

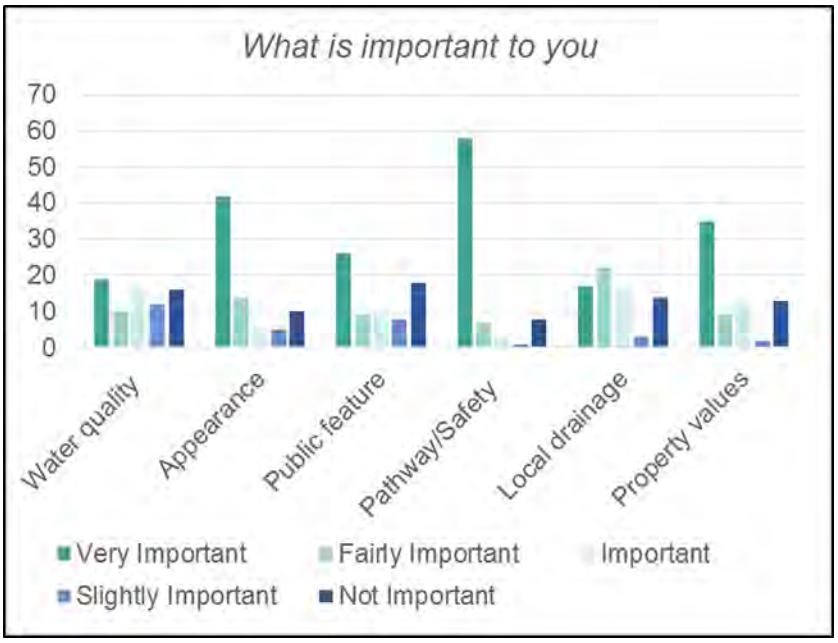
## As We Heard It Report – May 2017

Planning, Infrastructure and Economic Development
110 Laurier Street West, Ottawa, ON K1P 1J1

**As We Heard It**
**Baseline/Woodroffe Stormwater Management Pond**
**Class Environmental Assessment**

Thanks to all who provided comments via the online information session (November 3, 2016 to January 16, 2017), the January 9, 2017 public meeting and through individual correspondence with City staff. A total of 98 responses to the online information session were received and 49 people signed in at the January public meeting.

The figure below summarizes the values identified by those who responded to the online questionnaire.




All comments received have been summarized and responses provided, including how the pond concept has been revised in response to these comments.

| Comment/Concern | | Response |
|---|---|---|
| **Public health and safety concerns** | i) Mosquitoes | Mosquitoes: The pond will provide water movement (due to wind activity and continuous flow from a large inlet storm sewer) that will discourage mosquitoes and avoid excessive odours. However, the potential for habitat conducive to mosquitoes cannot be completely eliminated, particularly at the shallower edges of the pond. The City's experience to date with over 100 other wet ponds indicates excessive mosquitoes (over and above what is currently experienced on the site) should not result. However, the application of larvicide to the pond would be undertaken if necessary to respond to this issue over the life of the pond. |
| | ii) Concern due to permanent open water | Safety: Safety concerns are a primary consideration in the design of any stormwater management pond the City constructs.<br>Typical approaches include:<br>• clear signage at key locations regarding the function of the pond<br>• the use of plantings to actively discourage access to the open water<br>• decorative fencing (not continuous chain link) to better delineate the pond area (in winter and summer).<br>Ponds are also provided with flatter side slopes near and below the water's edge. The flatness of the slope in this area of the pond ensures that a person could navigate the slope should there be a need to.<br><br>The City has considerable experience with these facilities in urban areas and is committed to providing a safe environment around the pond through proper design and maintenance. |
| | iii) Concern that pedestrians will cut across surface of pond if/when frozen in winter; risk of breaking through the ice | A pedestrian crossing with guard rails will be provided near the mid-point of the pond. Smaller-scale/decorative fencing options can also help delineate the edge of the pond |
| | iv) Pond is located within the Bird Hazard Zone of the Airport; concerns that geese will be attracted to pond and | The proposed pond is located at the extreme northerly edge of the bird hazard zone, partially inside the boundary. The City has |

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| | adjacent schoolyard | retained a wildlife management expert who has recommended mitigating measures to be incorporated in the pond design that will discourage geese and gulls (the birds of primary concern) from frequenting the site. These measures include:<br>• narrow linear design with much of the pond being 25 m or less in width (geese prefer larger/wider open water areas that provide greater distance from potential predators)<br>• peninsula will be provided with dense shrub plantings and root wads along the shoreline to prevent loafing and nesting opportunities for geese<br>• minimum 5m width of dense shrub planting adjacent to the water's edge (geese prefer easy access to the water's edge)<br>• manicured areas (preferred by geese) will be strictly limited to a 1.5m mow strip adjacent to the pathways; all other upland/open space areas will be reforested or provided with tall grass/meadow conditions to discourage geese.<br>The proposed mitigating measures have been presented to Transport Canada and the Airport Authority. Discussions are ongoing on this issue.<br><br>The mitigating measures to discourage geese will have no negative impacts on other birds (songbirds, raptors). |
| **Concerns re: increased risk of flooding** | i) Increase in groundwater levels/flood risk to basements of adjacent homes | The proposed pond will not result in increased flood risk to adjacent properties, either from groundwater levels or fluctuating water levels in the pond during rainfall events. Existing homes that abut the site of the proposed pond are well above the permanent water level in the pond of 78.90m and the maximum (100yr) water level in the pond of 80.15m. For example, as shown on **Figure 1**, the existing elevation at the rear property line of Field Street homes is about 84.50m.<br>Conservatively assuming no further increase in grade at the house, the basements of these |

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| | | homes would not be below 81.50m - still well above the 100year pond level of 80.15m. Also, the design of the inlet to the pond will preclude the maximum water level from rising any higher, as excess flows will bypass the pond and continue downstream. |
| | ii) Concern that major storms will flood adjacent homes if outlet becomes blocked; concern that ice may block or freeze up the outlet | If the outlet were to become blocked, flows would be forced back out via the inlet structure and into the creek to be conveyed downstream without further increasing the maximum water level in the pond. |
| | iii) Pond liner may be needed; may not be enough to prevent flooding | While the *Feasibility Study (2015)* deemed a pond liner unnecessary, this will be revisited and confirmed during detailed design on the basis of further geotechnical field work. The purpose of the pond liner (if confirmed to be required) would not be to prevent flooding of adjacent homes (they are too high to be at risk) but to avoid a reduction in the required permanent water depth due to exfiltration (loss of water) into the surrounding soils. |
| | iv) Local drainage impacts | Site grading and excavation for the pond will not negatively impact the existing drainage in the vicinity of adjacent properties. |
| **Habitat / Endangered Species** | i) Butternut tree protection | One butternut tree was originally identified in the *Feasibility Study (2015)*. Additional study was completed in January 2017, and fifty-six (56) Butternut trees (*Juglans cinerea)* have been identified in the area. A recent visit to the site has revealed a number of small saplings that were undetectable under the winter snow cover. This number will be confirmed. Under the Species at Risk Act (S.C. 2002, c. 29), all butternuts found on federal property are protected, unless they are determined to be hybrid. Hybridity testing will be undertaken when field conditions permit, to confirm the genetic status of the trees within or adjacent to the area of impact.<br><br>As a precautionary approach, a 50m buffer has been applied to the single mature butternut (not a hybrid) on the site, and an appropriate buffer will be applied to all other true butternuts on |

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| | | site. The landscaping and pathway relocation that was originally proposed on the eastern portion of the site has been substantially reduced to avoid butternut tree impacts. However, the relocated pathway and the pond grading may encroach on some of these buffers. Appropriate mitigation techniques will be applied to reduce impacts to these individual trees. |
| | ii) Wildlife/habitat removal needs to be more careful | The City and the NCC will work together to ensure that this project is not likely to cause significant adverse effects to all listed species under the federal Species at Risk Act including the Monarch butterfly. Mitigation measures to arrive at that result will be determined through the environmental review of this project under section 67 of the *Canadian Environmental Assessment Act*, 2012. |
| | iii) NCC does not cut the grass anymore because of the milkweed/Monarch butterfly habitat | The Monarch is protected under the federal *Species at Risk Act* (SARA).Its status was elevated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to Threatened Species in December 2016 but is still currently listed as Special Concern under SARA. The landscaping plan will include plants which have breeding and nectaring habitat opportunities such as milkweed. |
| **Pathways** | i) Current pathway does not connect to appropriate location on Pinecrest pathway at Woodroffe Avenue | When completed, pedestrian pathways will be incorporated and connected to City of Ottawa pathway and NCC Capital Pathway networks. |
| | ii) Realign path to better match pathway at the Fire Station | It is not feasible to cross Woodroffe Avenue at the southern traffic signal so the proposed pathways currently match existing near Woodroffe Avenue. The multi-use pathway crossing at Woodroffe Avenue makes use of the existing signalized intersection for the Fire Station and connects the trails on the east and west side of Woodroffe Avenue |
| | iii) Concern with transition time between construction and implementation regarding routing of pathway | The City will work to maintain the existing multi-use pathway throughout the construction period. During the final site works, the north-south pathway connections will be constructed. |
| | iv) Concern that pathway in Option 2 along the backyards | This pathway location has been revised and will be pushed further west to address concerns. It |

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| | on Navaho Drive would require increased home security and lighting | will be offset from the rear yards of the homes along Navaho Drive, and additional planting will be provided as a buffer between the pathway and the rear yards. |
| **Consultation** | i) Lack of notification to abutting property owners | During the consultation undertaken in 2009 and 2010 for the *SWM Retrofit Study (2011)*, residents abutting the proposed pond location should have received direct notice. At that time, standard notification included newspaper advertisements and open houses. |
| | ii) Community Association found out about the project late | The *Feasibility Study (2015)* did not include public consultation as it was not yet certain whether NCC, as the owner of the property, would ultimately permit the construction of the SWM pond. If the NCC were to object, there would have been no need to pursue the pond further. Once NCC confirmed their acceptance of the pond based upon the concept provided in the *Feasibility* Study and funding for the pond was secured, the City was able to proceed with a Class Environmental Assessment, including public consultation.<br><br>City staff had an initial mailing list that did not include the Bel Air Community Association but a notice was sent out on November 9, 2016 immediately after we were contacted by a resident (initial notices were published on November 3, 2016).<br><br>Given the feedback received from the November 2016 online consultation, a Public Meeting was arranged for January 9, 2016 and the original deadline for comments was extended to January 16, 2017.Public meeting notices were mailed to all properties abutting the proposed pond site. |
| | iii) Did the *Feasibility Study (2015)* to go to Council for approval? | The *Feasibility Study* was not brought to City Council for approval. As noted above, this study was an initial effort to confirm whether the NCC, as the owner of the property, would ultimately permit the construction of the SWM pond. Once the NCC confirmed their acceptance of the pond based upon the further details provided in the *Feasibility Study* and funding for the pond was secured, the City was able to proceed with a Class Environmental Assessment, which will |

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| | | proceed to the Environment and Climate Protection Committee and City Council for approval. |
| | iv) SWM Retrofit Study included no evidence of contacting Community Associations or doing proper consultation | Community Associations on record with the City when the *Retrofit Study* began (2009) were included on the project mailing list.<br>A detailed record of the consultation undertaken is provided in Appendix O of the *Retrofit Study (2011)* available here: http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html |
| | v) St. Daniel's school was contacted and the principal had not been notified | St. Daniel's School's principal and staff of the Ottawa Carleton School Board (OCSB) were contacted in 2012 during the preparation of the *Feasibility Study (2015*) and no objections to a pond on the site were raised. The OSCB was also notified of the November 2016 online information session and the January 2017 public meeting.<br>The City received a response from the OCSB subsequent to the November 2016 online information session requesting that the facility be designed to reduce risks and limit the extent of standing water to the greatest extent possible. |
| **Alternatives to the pond** | i) What, if any, alternate sites were considered? | Through the detailed screening completed in the *SWM Retrofit Study (2011*), this site was one of only 5 sites that offered sufficient space for end-of-pipe retrofits. Of these 5 sites, only 3 were carried forward in the final Retrofit Plan (refer to Figure 3 in Part D: Implementation and Monitoring Plan of the SWM Retrofit Study available at this link: http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html ).<br><br>The site at the northeast corner of Baseline Road and Woodroffe Avenue was the largest of the short-listed sites, offering the best opportunity to provide significant benefits. The measures at the other short-listed sites included a (subsurface) oil grit separator in Elmhurst Park and near Connaught Park. These measures were proposed in addition to the Baseline Woodroffe pond, not as alternatives to it.<br><br>Yes – a wet pond in this location was the only |

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| | ii) Was a wet pond the only type of pond to be considered? Was a dry pond considered? | type of pond considered. Wet ponds are the most effective at improving water quality as they avoid resuspension of collected sediments during each rainfall event. Dry ponds for water quality control are not recommended for this reason. |
| | iii) Was there an option with no pond? | The *SWM Retrofit Study (2011*) considered a scenario with no ponds or end-of-pipe facilities but this was not selected as the preferred retrofit approach for the Pinecrest Creek subwatershed. |
| | iv) An underground option should have been considered as it would alleviate many of the concerns | An underground option that could provide comparable benefits to the proposed pond would be significantly more expensive to construct and maintain and is not considered practical or affordable in this context. |
| | v) The SWM Retrofit Study looked at options other than a pond, such as rain barrels, porous pavement, etc. - these were high on the list of options and cheaper – why were they not considered? | Other retrofit measures have also been considered and will be implemented over time as the City rebuilds existing streets and City-owned facilities. However, the proposed pond was also recommended as one part of an overall solution that included a range of retrofit measures. |
| | vi)Examples of existing similar ponds for reference | Examples of existing similar ponds include:<br>• Corrigan Pond: located west of the Jock River on Half Moon Bay at Tuscana Way (Barrhaven)<br>• Todd Pond (close to Corrigan Pond): located near 2647 Fallingwater Circle (Barrhaven)<br>• Clarke Bellinger pond: located near 129 Leikin Drive (former Nepean)<br>• Strandherd pond: located near 3110 Prince of Wales north of Woodroffe Avenue.<br>The general locations of these ponds are provided on the attached **Figure 2**. |
| **How pond will operate under different conditions; design features** | i) Will the peninsula be covered during larger storms? | Yes – the south peninsula will be flooded to a maximum depth of 0.3m during a 100 year event. The north peninsula will remain dry during a 100 year storm event. During more frequent events that will occur several times a year, the depth of flooding will just reach the crest of the south peninsula (25mm of rainfall) or lower (rainfall less than 25mm). |

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| | | The proposed pedestrian crossing of the pond will not be subject to flooding during a 100year event. |
| | ii) What will be the total depth of the pond at the deepest point? | During dry weather, the maximum wet depth of the pond will be 3m in the forebay near the pond inlet. The permanent wet depth elsewhere in the pond will be about 1.5m.<br>During a 100 year storm event, the total (maximum) depth of water would increase to 4.25 m and then drain down to the permanent wet depth of 1.5 to 3m over a period of 3 to 4 days.<br><br>During more frequent events (up to about 25mm rainfall) that would occur every year, the total water depth would rise to about 4m total depth and drain down to the permanent wet depth of 1.5 to 3m in about 2 to 3 days.<br><br>Please refer to **Figure 1** attached, that illustrates the above-noted range of water levels. |
| | iii) Height of proposed landscape berms? | The extent of berming has been significantly reduced for aesthetic reasons to be more consistent with the lands north of Iris. Subject to excavation and disposal costs, some limited berming may be included in the detailed design. |
| **Pond maintenance** | i) Concern that pond will not be maintained | All stormwater management facilities owned and operated by the City (100+ wet ponds) are subject to regular maintenance to ensure continued performance and address concerns as they arise. Each pond requires an Environmental Compliance Approval (ECA) from the provincial Ministry of Environment and Climate Change which has conditions requiring regular inspection and maintenance<br>On-going operation and maintenance costs of all stormwater management facilities in the City are tracked and budgeted for annually. These costs are and will continue to be reflected in the resulting stormwater rate. |
| | ii) How often will pond have accumulated sediments dredged? | Sediment removal will be required approximately once every 10 years. Clean-out/dredging with an excavator will last about a week and likely take place in winter months. Local residents will be notified in advance of dredging operations |

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| | | proceeding. |
| | iii) Dogwalkers frequenting the site do not clean up after their pets; need for bylaw enforcement, signage, provision of dog waste bags on-site | Potential for additional signage and/or enforcement of by-law will be discussed with NCC. |
| | iv) When dredging in winter, how are inhabitants of the pond dealt with (frogs, fish, etc)? | Prior to dredging, the presence of fish would have to be confirmed and removals may be required.<br>All regulations at the time the dredging takes place will be complied with. |
| | v) Concern that property values will decrease | Where similar facilities exist in newer developments throughout Ottawa, they continue to be popular and well-used by local residents. Design features and landscaping measures that create an attractive and aesthetically pleasing community asset will be a high priority in the detailed design. |
| **Purpose and effectiveness of pond** | i) If this SWM pond has only a 10% effect on flow rate, is it worth the money to build it? | The pond was primarily recommended to improve the water quality of runoff from the catchment area and reduce erosion downstream. Significant benefits to the creek can be provided by storing and releasing the runoff more slowly from the very frequent, smaller rainfall events that the pond has been designed for. There are also flooding concerns in the creek, particularly where the creek was enclosed (piped) just south of Carling Avenue. This piping occurred during the 1960s and has resulted in a relatively high flood risk to the Sir John A. MacDonald Parkway (SJAMP). While the pond cannot be made large enough to eliminate the flood risk to the SJAMP at this location, it will provide some benefit in reducing the extent of flooding during major storm events. |
| | ii) Continuing benefits of pond questioned with the advent of climate change | The pond will continue to provide significant benefits notwithstanding the future impacts of climate change. This is based on comparing these benefits (improved water quality, reduced erosion impacts and some limited flood control) to the current situation where stormwater runoff from a large area (some 435ha) is uncontrolled |

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| | | and untreated prior to direct discharge to Pinecrest Creek.<br>Even with the advent of climate change, the pond will continue to provide treatment and flow attenuation for a large proportion of rainfall events, improving conditions in the creek as compared to the current uncontrolled condition. |
| | iii) Effectiveness of the impacts/benefits of the pond downstream questioned; pond will address only one of several major storm outlets; what about other storm outlets downstream? | The proposed pond is only one part of a longer-term solution for the whole of the Pinecrest Creek subwatershed and the adjacent Westboro area. The pond is not being built as a single solution but is the first major investment aimed at mitigating the long-standing impacts of uncontrolled urban runoff on Pinecrest Creek and the local reach of the Ottawa River. Additional retrofits implemented over time will also contribute to mitigating the impacts of runoff from other downstream storm outlets. These retrofits have been recommended in addition to the pond and not as an alternative to it. |
| | iv) How will the pond improve erosion in Pinecrest Creek? Where does the water go now? | The uncontrolled runoff from some 435 hectares of existing development drains to the creek from the storm sewer that outlets near the northeast corner of Baseline Road and Woodroffe Avenue. This runoff will continue to drain to the same location but will first be captured, stored and released slowly from the pond to mitigate current erosion conditions in the creek. |
| | v) Other properties (Algonquin College, College Square) should take on more responsibility | The City is actively working with Algonquin College in the implementation of their Water Strategy, in particular providing input to and guidance on their campus stormwater management plan. |
| | vi) What are the implications if the pond does not proceed? | If the pond is not built, the area will continue to drain as it does now. However, the creek will not receive the benefits of improved water quality, reduced erosion and (slightly) reduced flooding. The stormwater management requirements for the Baseline Station works that will be implemented with Stage 2 LRT would also have to be revisited. The pond is an important requirement for the construction of Baseline Station. The storm runoff from the station cannot |

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| | | be discharged directly to Pinecrest Creek without the offsetting mitigation to flooding and erosion impacts that will be provided by the pond. |
| | vii) Concerns that pond is proposed in an existing neighbourhood; pond is being built to address transit projects and intensification at expense of this neighbourhood; fear that pond will be expanded in future | The proposed pond was first identified as a retrofit project independent of any other City projects at the time. However, subsequent to the completion of the *Retrofit Study* in 2011, City staff wished to determine whether the NCC would support the runoff impacts of proposed works at Baseline Station being mitigated by the upstream pond rather than on-site SWM measures, given the very constrained conditions at Baseline Station.<br><br>In addition to providing NCC with a more refined concept of the proposed pond than had been provided in the 2011 *Retrofit Study*, the *Feasibility Study* also provided the analysis that confirmed the benefits of the pond could address the runoff impacts of the Baseline Station work which will now be completed as part of the Stage 2 LRT program. Notwithstanding the implementation of the pond, future redevelopment within the catchment area will still be required to implement appropriate on-site stormwater management measures in accordance with the City's current requirements.<br><br>There is no intent and it would not be feasible to expand the proposed pond in the future given various restrictions and lack of space on the site to do so. |
| | viii) Relationship to Stage 2 LRT | The pond construction will be "bundled" with the overall Stage 2 LRT construction to ensure it is constructed in a timeframe consistent with Baseline Station improvements. |
| | ix) SWM ponds are obsolete and have run their course; Federation of Canadian Municipalities does not recommend end-of-pipe SWM facilities and their Infra Guide recommends low impact development (LID) measures and underground storage tanks | Notwithstanding the continuing evolution of stormwater management, wet ponds remain an effective and widely-used approach to address the impacts of urban runoff on receiving streams. That being said, the City is also taking steps to implement other approaches to mitigate the impacts of urban runoff on receiving streams. Pilot projects implementing bioretention (or "rain gardens") have recently been implemented on Sunnyside Avenue in old Ottawa South and |

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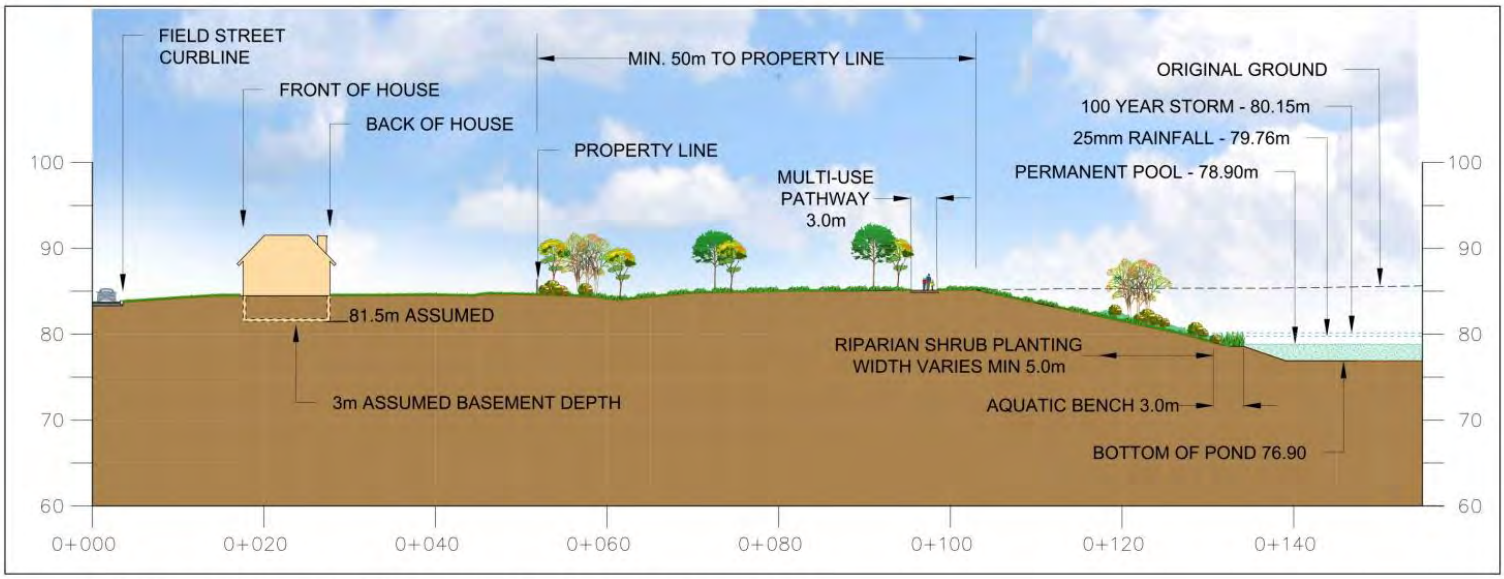
| | | Stewart Street in Sandy Hill.<br><br>Further efforts within the Pinecrest Creek subwatershed include:<br>• Hemmingwood Way: A number of bioretention features are proposed in conjunction with forthcoming area traffic management measures. These are now in design and will be constructed in 2018.<br>• Outreach: A further initiative is being launched this year that will focus on outreach efforts to educate residents about stormwater management and encourage homeowners to take action to reduce runoff from their properties.<br><br>The FCM document referenced notes that, *"Wet ponds are less suitable for retrofit situations and are typically unsuitable for infill situations, because of their comparatively large land area and drainage area requirements (typically > 5 ha to allow adequate turnover and sustainability)."*<br><br>In this case, there is a very large contributing drainage area (some 435ha) for turnover purposes and sufficient land area to construct a pond that will provide significant downstream benefits. |
| NCC approval process | Has NCC officially signed off on the project?<br><br>NCC board approval is required | NCC has advised: The pond is under review in Capital Planning Branch, Federal Approvals and Environment. It is going through a Level 2 design review. Level 2 design approval projects are reviewed by a cross-functional work group of NCC staff and then presented to an Internal Design Review Committee (IDRC) – which has been done. Once the design has been revised and finalized to NCC staff's satisfaction, the project will be sent to an executive committee of the NCC Board for approval, via an E-vote. After the Board approves the project, the executive director of the Capital Planning Branch will sign the approval.<br><br>The City has and continues to consult closely with NCC about the proposed pond. |

**Figure 1 – Range of water levels in pond**




TYPICAL CROSS–SECTION OF POND NEAR FIELD STREET


Figure 2. Examples of Similar Stormwater Management Ponds
Figure 2. Exemples de bassins de rétention des eaux pluviales existants
Bassin Clarke Pond
Located near 129 Leikin Drive
Situé près de 129 promenade Leikin
Bassin Strandherd Pond
Located near 3110 Prince of Wales
Situé près de 3110 promenade Prince of Wales
Bassin Corrigan Pond
Located on Half Moon Bay Road at Tuscana Way
Situé sur le chemin Half Moon Bay, proche du chemin Tuscana
Bassin Todd Pond
Located near 2647 Fallingwater Circle
Situé près de 2647 Cercle Fallingwater
ch. Fallowfield Rd.
prom. Longfields Dr.
prom. Leikin Dr.
ch. Merivale Rd.
ch. River Rd.
ch. Leitrim Rd.
av. Woodroffe Ave.
prom. Crestway Dr.
prom. Prince Of Wales Dr.
prom. Strandherd Dr.
prom. Chapman Mills Dr.
ch. Greenbank Rd.
ch. Spratt Rd.
ch. Earl Armstrong Rd.
prom. Paul Métivier Dr.
ch. Jockvale Rd.
ch. Cambrian Rd.
ch. Rideau Rd.
0 0.25 0.5 1
Kilometers

# Ville d’Ottawa

**Bassin de rétention des eaux pluviales à l’angle du chemin Baseline et de l’avenue Woodroffe Évaluation environnementale de portée générale**

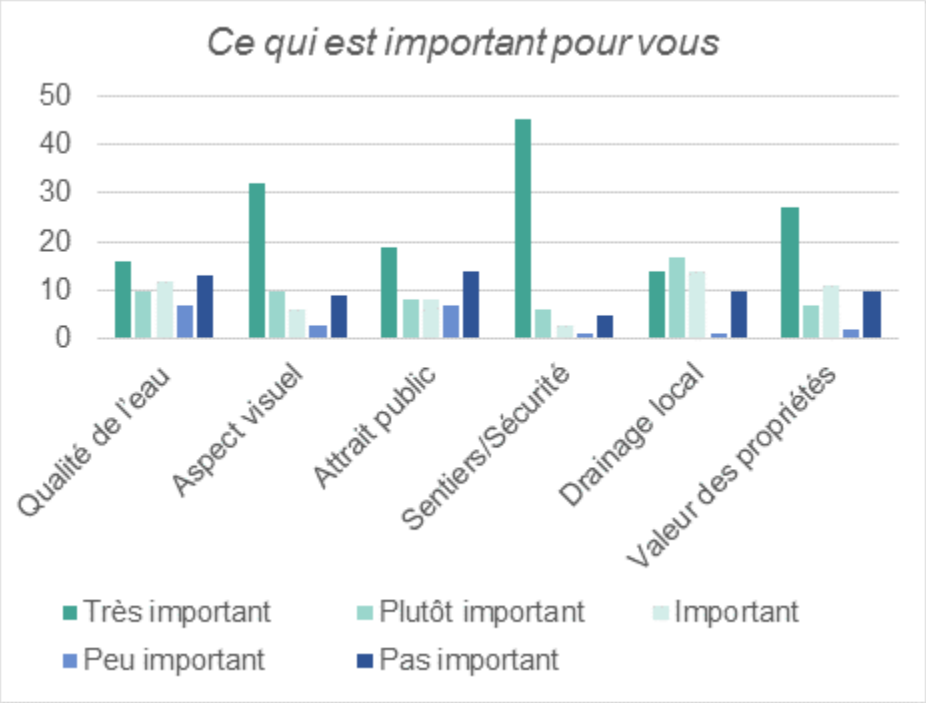
Ce qui a été di – le mai 2017

Services de planification, d'infrastructure et de développement économique, 110, avenue Laurier Ouest, Ottawa, ON K1P 1J1

**Ce qui a été dit :**
**Bassin de rétention des eaux pluviales à l'angle du chemin Baseline et de l'avenue Woodroffe**
**Évaluation environnementale de portée générale**

Merci à tous ceux qui ont fait part de leurs commentaires à la séance d'information en ligne (du 3 novembre 2016 au 16 janvier 2017) et à la réunion publique du 9 janvier 2017, ainsi que par correspondance individuelle avec le personnel de la Ville. Nous avons reçu 98 réponses lors de la séance d'information, et 49 personnes ont participé à la réunion publique en janvier.

Le graphique ci-dessous résume les opinions formulées par ceux qui ont rempli le questionnaire en ligne.




Tous les commentaires ont été résumés, et les réponses indiquées, avec la nouvelle définition d'un bassin qui en découle.

| Commentaire/problème | | Réponse |
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| **Santé et sécurité publiques** | i) Moustiques | Moustiques : L'eau du bassin ne stagnera pas (en raison du vent et du courant continu provenant d'une prise d'eau d'égout pluvial de grand diamètre), ce qui dissuadera les moustiques et évitera les odeurs fortes. Cependant, il est impossible d'éliminer complètement les caractéristiques d'un habitat propice aux moustiques, surtout au bord du bassin où l'eau est peu profonde. À ce jour, l'expérience de la Ville avec plus de 100 bassins avec retenue permanente révèle que la population de moustiques ne devrait pas augmenter. Par contre, on procédera à l'épandage de larvicide si la santé du bassin en dépend. |
| | ii) Eau libre en permanence | Sécurité : La sécurité est une priorité de la Ville dans la conception de ses bassins de rétention des eaux pluviales.<br>Approche habituelle :<br>• Signalisation bien en vue aux endroits importants indiquant la fonction du bassin;<br>• Végétation visant à dissuader les gens d'accéder au bassin;<br>• Clôtures décoratives (pas de clôtures à mailles losangées) délimitant la zone du bassin (en hiver et en été).<br>De plus, près du bord et sous l'eau, les parois des bassins sont moins inclinées. Cette pente douce permet d'entrer dans l'eau et d'en sortir si besoin est.<br><br>La Ville possède une grande expérience de ces installations dans les zones urbaines et s'efforce de concevoir des bassins sécuritaires et de les entretenir adéquatement. |
| | iii) Piétons traversant la surface glacée du bassin en hiver; risque de défoncer la glace | Un passage pour piétons muni de garde-corps sera aménagé à peu près au centre du bassin, et des types de clôtures décoratives plus petites peuvent aussi marquer le bord de celui-ci. |
| | iv) Emplacement du bassin dans la zone de péril aviaire de l'aéroport; attraction des bernaches au bassin et à la cour d'école du voisinage | Le bassin proposé sera situé à l'extrémité nord de la zone de péril aviaire, partiellement à l'intérieur de cette dernière. La Ville a retenu les services d'un expert en gestion de la faune, |

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| | | qui a recommandé l'intégration de mesures d'atténuation dans la conception du bassin en vue d'éloigner les bernaches du Canada et les goélands (les espèces d'oiseaux les plus préoccupantes) :<br>• Conception linéaire et étroite; largeur de 25 m et moins sur la plus grande partie du bassin (les bernaches préfèrent les plans d'eau plus grands et plus larges, où elles sont loin des prédateurs);<br>• Péninsule accueillant des buissons touffus et des mottes racinaires le long du rivage pour empêcher la fréquentation et la nidification par les bernaches;<br>• Buissons touffus sur une largeur minimale de 5 m jusqu'au bord de l'eau (les bernaches aiment avoir un accès facile au rivage);<br>• Zones entretenues (appréciées des bernaches) limitées strictement à une bande tondue de 1,5 m de large en bordure des sentiers; toutes les autres zones sèches ou dégagées seront reboisées ou aménagées avec des herbes hautes ou des prés afin d'éloigner les bernaches.<br>Les mesures d'atténuation proposées ont été présentées à Transports Canada et à l'Administration de l'aéroport. Les délibérations à ce sujet sont en cours.<br><br>Les mesures d'éloignement des bernaches n'auront aucun effet sur les autres espèces d'oiseaux (oiseaux chanteurs, rapaces). |
| **Risque d'inondation accru** | i) Élévation de la nappe souterraine et augmentation du risque d'inondation dans les sous-sols des domiciles à proximité | Le bassin proposé n'augmentera pas le risque d'inondation dans les propriétés à proximité par l'élévation de la nappe souterraine ou du niveau d'eau lors des averses. Les domiciles existants contigus au site proposé sont situés bien au-delà du niveau d'eau permanent (78,90 m) et du niveau des crues de récurrence de 100 ans (80,15 m). Par exemple, selon la **figure 1,** la hauteur actuelle de la limite de propriété arrière des domiciles sur la rue Field se situe à environ 84,50 m.<br>Dans l'hypothèse prudente où la pente des |

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| | | terrains n'est pas accentuée près des domiciles, les sous-sols ne seraient pas sous 81,50 m, soit bien au-delà du niveau des crues de récurrence de 100 ans du bassin (80,15 m). De plus, la prise d'eau du bassin est conçue de façon à empêcher l'eau d'augmenter au-delà du niveau de crue en la détournant du bassin pour l'envoyer en aval. |
| | ii) Inondation des domiciles à proximité en cas de précipitations abondantes si l'exutoire est obstrué; congélation de l'eau dans l'exutoire ou obstruction par la glace | Si l'exutoire devait être obstrué, l'eau remonterait dans le ruisseau par la prise d'eau et serait évacuée en aval sans augmenter le niveau de crue du bassin. |
| | iii) Possibilité qu'une géomembrane soit nécessaire; peut ne pas suffire à empêcher les inondations | Bien que selon l'étude de faisabilité de 2015 une géomembrane ne soit pas nécessaire, sa pertinence sera réexaminée dans la conception détaillée à la lumière de travaux géotechniques supplémentaires sur le terrain. Le but de la géomembrane (si elle s'avère nécessaire) n'est pas d'empêcher l'inondation des domiciles à proximité (ils sont protégés par la hauteur), mais d'éviter que le niveau d'eau requis en permanence ne baisse à cause de l'exfiltration (perte d'eau par le sol). |
| | iv) Effets sur le drainage dans la zone | L'augmentation de la pente et l'excavation du bassin n'auront aucun effet néfaste sur la capacité de drainage actuelle près des domiciles à proximité. |
| **Habitat et espèces en voie de disparition** | i) Protection du noyer cendré | Au départ, l'Étude de faisabilité de 2015 avait relevé un seul noyer cendré. Une autre étude a été effectuée en janvier 2017, qui a permis de relever la présence de cinquante-six (56) noyers cendrés (*Juglans cinerea)* dans le secteur. Une récente visite des lieux a permis de repérer un certain nombre de jeunes gaules qui n'avaient pas été relevées sous la neige. Leur nombre reste à confirmer. En vertu de la *Loi sur les espèces en péril* (L.C.2002, ch.29), tous les noyers cendrés qui se trouvent sur un terrain appartenant au gouvernement fédéral sont protégés, à moins qu'il ne s'agisse de variétés hybrides. Des tests génétiques seront effectués lorsque les conditions du terrain le |

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| | | permettront afin de confirmer la nature génétique de ces arbres dans le secteur ou près du secteur concerné.<br>Comme moyen de précaution, une zone tampon de 50 m a été instaurée autour du seul noyer cendré mature (qui n'est pas un hybride) du secteur, et une zone tampon semblable sera instaurée autour de tous les autres noyers cendrés véritables du secteur. Le déplacement des sentiers et l'aménagement paysager proposés à l'origine dans la partie est du site ont été réduits considérablement pour éviter la perturbation des noyers cendrés. Cependant, le sentier déplacé et le nivellement de l'étang pourraient empiéter sur certaines de ces zones tampons. Des techniques d'atténuation appropriées seront utilisées pour réduire les répercussions sur chaque arbre en question. |
| | ii) Précautions additionnelles pour limiter la destruction de l'habitat et l'éloignement de la faune | La Ville et la Commission de la capitale nationale (CCN) collaborent pour que ce projet n'ait pas trop d'effets nuisibles sur les espèces visées par la *Loi concernant la protection des espèces sauvages en péril au Canada,* dont le monarque. Les mesures d'atténuation permettant d'y arriver seront déterminées par l'examen environnemental du projet, conformément à l'article 67 de la *Loi canadienne sur l'évaluation environnementale (2012).* |
| | iii) Arrêt de la coupe de pelouse par la CCN pour préserver l'asclépiade commune et l'habitat du monarque | Le monarque est protégé par la *Loi sur les espèces en péril* (LEP). Son état a été rehaussé à « espèce menacée » par le Comité sur la situation des espèces en péril au Canada (COSEPAC) en décembre 2016, mais il est toujours considéré comme « espèce préoccupante » dans la LEP. Le plan d'aménagement paysager prévoit des plantes qui créent un habitat de reproduction et produisent du nectar, comme l'asclépiade commune. |
| **Sentiers** | i) Sentier actuel ne débouchant pas sur un bon endroit du sentier du Ruisseau-Pinecrest à l'avenue Woodroffe | Lorsqu'ils seront terminés, les sentiers pour piétons seront intégrés aux réseaux de la Ville d'Ottawa et du Sentier de la capitale de la CCN.<br><br>Il est impossible de faire traverser le sentier au feu de circulation au sud sur l'avenue Woodroffe, et donc les sentiers projetés correspondent aux sentiers actuels des environs. Le sentier |
| | ii) Retraçage du sentier pour mieux l'adapter au site de la | |

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| | caserne de pompiers | polyvalent qui traverse l'avenue Woodroffe passe par le carrefour à feux de la caserne de pompiers et relie les sentiers des côtés est et ouest de l'avenue. |
| | iii) Durée de la transition entre la construction et la mise en service du sentier | La Ville s'efforcera de maintenir le sentier polyvalent en service pendant la construction. À la fin des travaux, les liens entre les sentiers nord et sud seront aménagés. |
| | iv) Besoin d'améliorer la sécurité et l'éclairage pour les arrière-cours le long du sentier (option 2) pour les domiciles de la promenade Navaho | Cette section du sentier a été réexaminée et sera déplacée vers l'ouest pour éviter les problèmes. Elle s'écartera des arrière-cours le long de la promenade Navaho, et une bande tampon de végétation sera aménagée entre le sentier et les arrière-cours. |
| **Consultation** | i) Manque de communication avec les propriétaires des terrains adjacents | Pendant la consultation entreprise en 2009 et 2010 dans le cadre de l'étude sur la modernisation des installations de gestion des eaux pluviales de 2011, les propriétaires des terrains adjacents auraient dû recevoir un avis en mains propres. À l'époque, les avis étaient publiés dans les journaux et communiqués lors de séances portes ouvertes. |
| | ii) Découverte tardive du projet par l'association communautaire | L'étude de faisabilité de 2015 n'avait pas de volet consultatif, car on ne savait pas si la CCN, le propriétaire du terrain, finirait par permettre la construction du bassin de rétention des eaux pluviales. Si la CCN avait refusé, le projet aurait été abandonné. Dès que la CCN a accepté la construction du bassin selon le concept exposé dans l'étude de faisabilité et que le financement a été obtenu, la Ville a pu commencer une évaluation environnementale de portée générale, qui comporte une consultation de la population.<br><br>Au début, le personnel de la Ville avait une liste de diffusion dont la Bel-Air Community Association ne faisait pas partie, mais il lui a envoyé un avis le 9 novembre 2016 immédiatement après qu'un résident a communiqué avec la Ville (les premiers avis avaient été envoyés le 3 novembre 2016).<br><br>Par suite des commentaires reçus à la consultation en ligne de novembre 2016, une |

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| | | réunion publique a eu lieu le 9 janvier 2016, et la période d'envoi des commentaires a été prolongée au 16 janvier 2017. Un avis annonçant la réunion publique a été envoyé par la poste à tous les propriétaires des terrains adjacents au site du bassin projeté. |
| | iii) L'étude de faisabilité de 2015 a-t-elle été soumise à l'approbation du Conseil municipal? | L'étude de faisabilité n'a pas été soumise à l'approbation du Conseil municipal. Nous venons de mentionner que cette étude était une première tentative de déterminer si la CCN, le propriétaire du terrain, finirait pas permettre la construction du bassin de rétention des eaux pluviales. Dès que la CCN a accepté la construction du bassin, après avoir pris connaissance des renseignements supplémentaires fournis dans l'étude de faisabilité, et que le financement a été obtenu, la Ville a pu commencer une évaluation environnementale de portée générale, qui sera soumise à l'approbation du Comité de l'environnement et de la protection climatique et du Conseil municipal. |
| | iv) Absence d'indications que l'étude sur la modernisation des installations de gestion des eaux pluviales a comporté une communication avec les associations communautaires ou une consultation en bonne et due forme | Les associations communautaires inscrites auprès de la Ville au commencement de l'étude sur la modernisation (en 2009) étaient sur la liste de diffusion du projet.<br>Un registre détaillé de la consultation se trouve à l'annexe O de l'étude sur la modernisation de 2011 :<br>http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html |
| | v) Communication avec l'école St. Daniel : le directeur n'était pas au courant | Le directeur et le personnel de l'école St. Daniel, du Ottawa Catholic School Board (OCSB), ont été joints en 2012 pendant la préparation de l'étude de faisabilité de 2015, et ils n'ont opposé aucune objection à la construction d'un bassin sur le site. L'OCSB a également été informé de la séance d'information en ligne de novembre 2016 et de la réunion publique de janvier 2017.<br>La Ville a reçu une réponse de l'OCSB après la séance d'information en ligne de novembre 2016, par laquelle on lui demandait de concevoir l'installation de façon à réduire au maximum les risques et l'eau stagnante. |
| **Solutions de** | i) D'autres sites ont-ils été | À l'évaluation détaillée de l'étude sur la |

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| **rechange au bassin** | envisagés? | modernisation des installations de gestion des eaux pluviales de 2011, le site actuel était l'un de seulement cinq emplacements assez grands pour la modernisation des points de rejet. Sur ces cinq emplacements, seuls trois ont été envisagés dans le plan de modernisation (voir la figure 3 à la partie D du plan de mise en œuvre et de surveillance de l'étude sur la modernisation des installations de gestion des eaux pluviales : http://www.rickchiarelli.com/baselinewoodroffe-stormwater-management.html).<br><br>Le site à l'angle nord-est du chemin Baseline et de l'avenue Woodroffe était le plus grand des emplacements présélectionnés, et il présentait de meilleures chances de succès. On comptait parmi les autres sites présélectionnés un désableur-déshuileur souterrain au parc Elmhurst et près du parc Connaught. Ces emplacements avaient été proposés en complément du bassin à l'angle du chemin Baseline et de l'avenue Woodroffe, et non à titre de solutions de rechange à ce dernier. |
| | ii) Le bassin avec retenue permanente est-il le seul type de bassin à avoir été envisagé? Un bassin sec a-t-il été envisagé? | En effet, le bassin avec retenue permanente est le seul type de bassin à avoir été envisagé à cet endroit. Les bassins avec retenue permanente améliorent la qualité de l'eau plus efficacement, car ils empêchent la remise en suspension des sédiments recueillis à chaque averse. C'est pourquoi les bassins secs ne sont pas recommandés pour le contrôle de la qualité de l'eau. |
| | iii) Y avait-il une option qui n'exigeait pas la construction d'un bassin? | L'étude sur la modernisation des installations de gestion des eaux pluviales de 2011 comportait un scénario sans bassin ni installation de point de rejet, mais il n'a pas été privilégié dans l'approche de la modernisation du sous-bassin hydrographique du ruisseau Pinecrest. |
| | iv) Il aurait fallu envisager l'option souterraine, qui réglerait bon nombre de problèmes | Une option souterraine présentant des avantages comparables à ceux du bassin projeté coûterait beaucoup plus cher à construire et à entretenir, et n'est pas considérée comme pratique ou abordable dans notre contexte. |

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| | v) L'étude sur la modernisation des installations de gestion des eaux pluviales a examiné des options autres qu'un bassin comme des citernes pluviales, des chaussées poreuses, etc. Ces options étaient parmi les plus intéressantes, et moins coûteuses – pourquoi n'ont-elles pas été envisagées? | D'autres mesures de modernisation ont aussi été envisagées, et elles seront mises en œuvre à mesure que la Ville reconstruit les rues et les installations municipales existantes. Cependant, il a été recommandé d'inclure le bassin projeté dans une solution globale qui comprend une série de mesures de modernisation. |
| | vi) Exemples de bassins existants semblables aux fins de comparaison | Voici des exemples de bassins existants semblables :<br>• Bassin Corrigan – situé à l'ouest de la rivière Jock, à l'intersection de la rue Half Moon Bay et de la voie Tuscana (Barrhaven);<br>• Bassin Todd (près du bassin Corrigan) – situé près du 2647, cercle Fallingwater (Barrhaven);<br>• Bassin de l'installation environnementale Clarke-Bellinger – situé près du 129, promenade Leikin (ancienne ville de Nepean);<br>• Bassin Strandherd – situé près du 3110, promenade Prince of Wales au nord de l'avenue Woodroffe.<br>L'emplacement de l'ensemble de ces bassins est indiqué à la **figure 2** ci-jointe. |
| **Fonctionnement du bassin dans différentes conditions; éléments conceptuels** | i) La péninsule sera-t-elle submergée lors des précipitations abondantes? | Oui : la péninsule du côté sud sera inondée sous un maximum de 0,3 m lors des crues de récurrence de 100 ans, tandis que celle du côté nord ne sera pas submergée. Pendant les crues qui auront lieu plusieurs fois par année, le niveau d'eau n'atteindra que la crête de la péninsule sud (25 mm de pluie) ou moins (moins de 25 mm de pluie).<br>Le passage pour piétons envisagé du bassin ne sera pas inondé lors des crues de récurrence de 100 ans. |
| | ii) Quelle sera la profondeur maximale du bassin? | Par temps sec, la profondeur maximale du bassin sera de 3 m, dans le bassin d'admission près de la prise d'eau. La profondeur en permanence ailleurs dans le bassin sera d'environ 1,5 m. |

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| | | Pendant les crues de récurrence de 100 ans, la profondeur maximale augmentera à 4,25 m, puis baissera sous l'effet du drainage à un niveau permanent de 1,5 à 3 m en trois ou quatre jours.<br><br>Au cours des crues plus fréquentes (de 25 mm de pluie et moins) qui auront lieu chaque année, la profondeur maximale augmentera à environ 4 m, puis baissera sous l'effet du drainage à un niveau permanent de 1,5 à 3 m en deux ou trois jours.<br><br>La **figure 1** ci-jointe illustre ces niveaux d'eau. |
| | Quelle sera la hauteur des talus paysagés projetés? | La taille des talus a considérablement été réduite pour des raisons d'esthétisme et d'uniformité avec le territoire au nord d'Iris. Sous réserve des coûts d'excavation et d'élimination, la conception détaillée pourrait prévoir quelques talus. |
| **Entretien du bassin** | i) Entretien déficient du bassin | Toutes les installations de gestion des eaux pluviales détenues et gérées par la Ville (plus de 100 bassins avec retenue permanente) font l'objet d'un entretien régulier visant à assurer leur bon fonctionnement et à régler les problèmes dès qu'ils surviennent. Chaque bassin est régi par une autorisation environnementale (AE) du ministère de l'Environnement et de l'Action en matière de changement climatique de l'Ontario qui impose des inspections et des entretiens réguliers.<br>Les coûts de fonctionnement et d'entretien permanents de toutes les installations de gestion des eaux pluviales de la Ville sont consignés et prévus au budget chaque année. Ils sont pris en compte dans les redevances d'eaux pluviales et continuerons de l'être. |
| | ii) Fréquence de dragage des sédiments accumulés dans le bassin | Les sédiments devront être dragués environ une fois tous les 10 ans. Le dragage, à l'aide d'une excavatrice, durera environ une semaine et aura probablement lieu en hiver. Les résidents recevront un préavis les informant de ces travaux. |
| | iii) Les promeneurs de chien ne ramassent pas les excréments de leur animal de compagnie; application du règlement, amélioration de la | Les possibilités d'amélioration de la signalisation et de l'application du règlement seront examinées avec la CCN. |

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| | signalisation et mise à la disposition de sacs sur place | |
| | iv) Gestion des animaux présents dans le bassin au moment du dragage | Avant le dragage, on devra confirmer si des poissons sont présents dans le bassin; il pourrait être nécessaire de les sortir.<br>Tous les règlements en vigueur au moment du dragage seront respectés. |
| | v) Diminution de la valeur des propriétés | Des installations semblables existent dans des aménagements plus récents de la ville, et elles sont toujours populaires et bien utilisées par les résidents. L'intégration d'éléments conceptuels et d'un aménagement paysager créant un espace communautaire attirant et joli sera l'une des priorités de la conception détaillée. |
| **Visée et efficacité du bassin** | i) Pertinence de la construction du bassin de rétention des eaux pluviales si son effet sur le débit est de seulement 10 % | À l'origine, la construction du bassin a été recommandée pour améliorer la qualité du ruissellement à partir de la zone de captage des eaux et diminuer l'érosion en aval. D'importants avantages peuvent être apportés au ruisseau en stockant l'eau et la faisant ruisseler plus lentement que lors des petits épisodes de pluie très fréquents pour lesquels le bassin a été conçu. Le ruisseau entraîne également des risques d'inondation, particulièrement où il était fermé (canalisation) tout juste au sud de l'avenue Carling. Cette canalisation a été installée durant les années soixante et a entraîné un risque relativement élevé d'inondation pour la promenade Sir-John-A.-Macdonald. Bien que le bassin ne puisse être élargi suffisamment pour éliminer les risques d'inondation à cet endroit, il pourra tout de même les atténuer en cas de précipitations abondantes. |
| | ii) Avantages à long terme du bassin remis en question à cause des changements climatiques | Le bassin apportera des avantages considérables, peu importe les effets qu'entraîneront les changements climatiques. Cette affirmation se confirme par la comparaison desdits avantages (amélioration de la qualité de l'eau, diminution de l'érosion et contrôle limité des inondations) à la situation actuelle où l'eau pluviale non traitée d'une zone étendue (environ 435 hectares) ruisselle librement et se déverse directement |

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| | | dans le ruisseau Pinecrest.<br>Même avec les changements climatiques, le bassin continuera de traiter l'eau et de réduire le débit pour une grande partie des épisodes de pluie. Ce faisant, les conditions du ruisseau seront meilleures que celles d'aujourd'hui. |
| | iii) Efficacité des effets et des avantages du bassin en aval; seulement un des principaux égouts pluviaux sera avantagé et non les autres égouts pluviaux en aval | Le bassin proposé n'est qu'une partie de la solution à long terme pour le sous-bassin hydrographique du ruisseau Pinecrest et le secteur adjacent de Westboro. Ce bassin n'est pas le point final à la solution, mais plutôt le premier investissement majeur visant à mitiger les effets de longue date du ruissellement libre aux abords du ruisseau Pinecrest et de la section locale de la rivière des Outaouais. D'autres modernisations seront effectuées pour mitiger davantage les effets du ruissellement pour les autres égouts pluviaux en aval. Ces modernisations ont été recommandées en plus du bassin; elles ne constituent pas une solution de rechange. |
| | iv) Diminution de l'érosion dans le ruisseau Pinecrest; nouvel itinéraire de l'eau | Le ruissellement libre de quelque 435 hectares de terrain se déverse dans le ruisseau à partir de l'égout pluvial qui débouche près du coin nord-est de l'intersection du chemin Baseline et de l'avenue Woodroffe. Le ruissellement continuera de se rendre au même endroit, mais l'eau sera d'abord stockée dans le bassin, puis relâchée doucement pour diminuer les effets de l'érosion. |
| | v) Propriétés autres qui devraient prendre plus de responsabilités (Collège Algonquin, College Square) | La Ville et le Collège Algonquin collaborent activement à la mise en œuvre d'une stratégie de gestion des eaux, particulièrement pour orienter le plan de gestion des eaux pluviales du campus. |
| | vi) Quelles sont les répercussions si le bassin n'est pas construit? | Si la construction du bassin ne va pas de l'avant, la zone continuera de se drainer comme elle le fait actuellement. Par contre, la qualité de l'eau dans le ruisseau ne sera pas meilleure, l'érosion ne diminuera pas et les risques d'inondation ne seront pas du tout atténués. De plus, les mesures de gestion des eaux pluviales à mettre en place pendant les travaux de l'étape deux du projet de train léger à la station Baseline devront être revues. Le bassin est une exigence importante |

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| | | dans le cadre de la construction de la station Baseline. Les eaux pluviales provenant de la station ne peuvent pas ruisseler et se déverser directement dans le ruisseau Pinecrest sans l'atténuation des risques d'inondation et des effets de l'érosion que procurera le bassin. |
| | vii) Bassin proposé dans un quartier déjà aménagé; construction du bassin pour répondre aux besoins du projet de transport en commun et de l'intensification au détriment du quartier; crainte d'expansion du bassin dans le futur | Le bassin proposé a d'abord été présenté comme un projet de modernisation indépendant de tout autre projet de la Ville. Toutefois, après l'étude sur la modernisation de 2011, le personnel de la Ville se demandait si la CCN accepterait que les effets sur le ruissellement qu'entraîneraient les travaux proposés à la station Baseline soient atténués par un bassin en amont plutôt que par des moyens de gestion des eaux pluviales sur le site même, où les restrictions sont très importantes.<br><br>En plus de fournir à la CCN un concept plus élaboré que le bassin proposé dans l'étude sur la modernisation de 2011, l'étude de faisabilité a confirmé que les avantages potentiels du bassin viendraient contrer les effets des travaux de la station Baseline sur le ruissellement pendant l'étape deux du projet de train léger. Même sans la mise en place du bassin, un réaménagement de la zone de captage des eaux sera requis pour mettre en œuvre des moyens de gestion des eaux pluviales qui répondent aux exigences actuelles de la Ville.<br><br>Le bassin n'est pas conçu en vue d'un élargissement futur. D'ailleurs, il ne serait pas possible de le faire en raison de diverses restrictions et du manque d'espace. |
| | viii) Lien avec l'étape deux du projet de train léger | La construction du bassin sera intégrée à l'Étape 2 du projet de train léger pour que l'échéancier respecte celui des travaux à la station Baseline. |
| | ix) Les bassins de gestion des eaux pluviales sont désuets et ont fait leur temps; la Fédération canadienne des municipalités ne recommande pas de mettre en place des installations de | Malgré l'évolution constante de la gestion des eaux pluviales, les bassins avec retenue permanente demeurent un moyen efficace et très utilisé pour atténuer les effets du ruissellement urbain sur les cours d'eau. Cela étant, la Ville entreprend aussi la mise en œuvre d'autres moyens d'atténuation. |

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| | gestions des eaux pluviales au bout de canalisations, et l'InfraGuide recommande des méthodes de gestion écologique des eaux pluviales (GEP) et des réservoirs de stockage souterrains | Un projet pilote de biorétention (ou « jardin de pluie ») a récemment été mis en œuvre sur l'avenue Sunnyside dans le Vieil Ottawa-Sud et sur la rue Stewart dans la Côte-de-Sable.<br><br>Voici des mesures supplémentaires pour le sous-bassin hydrographique du ruisseau Pinecrest :<br>• Voie Hemmingwood : Plusieurs éléments de biorétention sont proposés conjointement aux mesures de gestion de la circulation locale à venir. Ces éléments sont en conception et seront construits en 2018.<br>• Sensibilisation : Une initiative de sensibilisation sera lancée cette année pour informer les résidents sur la gestion des eaux pluviales et encourager les propriétaires à prendre des moyens pour réduire le ruissellement provenant de leur propriété.<br><br>L'InfraGuide dit que les bassins avec retenue permanente *« sont plus ou moins recommandés pour les projets de modernisation et ils ne sont habituellement pas du tout recommandés dans le cas des projets réalisés sur terrain intercalaire, en raison des superficies de terrain et de drainage nécessaires comparativement importantes (habituellement > 5 ha pour permettre une durabilité et un renversement adéquats). »*<br><br>Dans le cas qui nous intéresse, la zone de drainage est très étendue, environ 435 ha, ce qui est suffisant pour y construire un bassin qui apporterait des avantages considérables en aval. |
| **Processus d'approbation de la CCN** | La CCN a-t-elle officiellement approuvé le projet?<br><br>Approbation du conseil d'administration de la CCN requise | CCN a indiqué que la Direction de l'aménagement de la capitale examine le projet de bassin, qui doit aussi recevoir les approbations fédérales et environnementales. La conception est à la deuxième phase d'examen. Les projets qui en sont à cette phase sont examinés par un groupe de travail interfonctionnel composé d'employés de la CCN, puis présentés à un comité de révision interne – ce qui a été fait. Une fois la conception revue et corrigée selon les exigences de la CCN, le projet est envoyé à un comité exécutif du conseil d'administration de la CCN pour être soumis à un |

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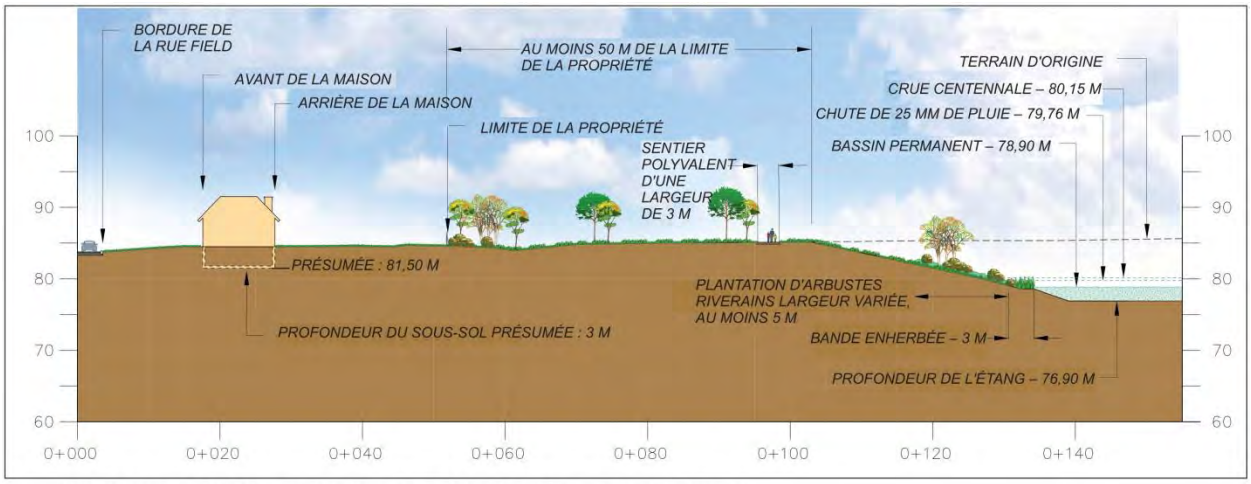
| | | vote électronique. Après l'approbation du conseil, le directeur général de la Commission de la capitale nationale signe l'approbation.<br><br>La Ville continue de travailler en étroite collaboration avec la CCN sur le bassin proposé. |

**Figure 1 – Niveaux d'eau dans le bassin proposé**




COUPE TRANSVERSALE TYPIQUE DU BASSIN PRÈS DE LA RUE FIELD

**Figure 2. Examples of Similar Stormwater Management Ponds**

*Figure 2. Exemples de bassins de rétention des eaux pluviales existants*