

# Alexandra Bridge Replacement Project

## Detailed Project Description

Submitted in accordance with the  
*Impact Assessment Act*

Public Services and Procurement Canada  
in collaboration with  
National Capital Commission

PSPC Project No.: [R.103064]  
Date: January 26, 2023



Public Services and  
Procurement Canada

Services publics et  
Approvisionnement Canada



Canada

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## List of Acronyms

ATRIS	Aboriginal and Treaty Rights Information System
ACPDR	NCC's Advisory Committee on Planning Design and Realty
ACUA	NCC's Advisory Committee on Universal Accessibility
AMSL	Above mean sea level
ARCDW	<i>Act respecting the conservation and development of wildlife (Quebec)</i>
ARTVS	<i>Act respecting threatened or vulnerable species (Quebec)</i>
BMP	Best Management Practices
CDPNQ	Centre de données sur le patrimoine naturel du Québec
CMA	Census Metropolitan Area
dBA	Decibels
DPD	Detailed Project Description
DFO	Fisheries and Oceans Canada
EASR	Environmental Activity and Sector Registry
ECCC	Environment and Climate Change Canada
EPP	Environmental Protection Plan
EQA	<i>Environmental Quality Act (Quebec)</i>
ESA	<i>Endangered Species Act, 2007 (Ontario)</i>
FLUDTA	Federal Land Use, Design and Transaction Approval
FTE	Full-time employee
FWCA	<i>Fish and Wildlife Conservation Act, 1997 (Ontario)</i>
GBA Plus	Gender-Based Analysis Plus
GDP	Gross Domestic Product
HIA	Heritage Impact Analysis
IAA	<i>Impact Assessment Act (Canada)</i>
IAAC	Impact Assessment Agency of Canada
IPD	Initial Project Description
IPT	Integrated Project Team
ISC	Indigenous Services Canada
LCCA	Lifecycle Cost Analysis
MBCA	<i>Migratory Birds Convention Act, 1994 (Canada)</i>



MCC	Ministry of Culture and Communications (Quebec)
MECP	Ministry of the Environment, Conservation and Parks (Ontario)
MEFCCWP	Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks (Quebec)
MKAT	Mobilizing Knowledge for Active Transportation
MNRF	Ministry of Natural Resources and Forestry (Ontario)
MNRFQ	Ministry of Natural Resources and Forests (Quebec)
MTCS	Ministry of Tourism, Culture and Sport (Ontario)
MTO	Ministry of Transportation (Ontario)
MTQ	Ministry of Transportation (Québec)
NCC	National Capital Commission
NCR	National Capital Region
OHA	<i>Ontario Heritage Act</i>
PSPC	Public Services and Procurement Canada
PTTW	Permit to Take Water
SARA	<i>Species at Risk Act (Canada)</i>
SPI	Strategic Partnerships Initiative
SSPPS	Survey for Safety in Public and Private Spaces
STO	Société de transport de l'Outaouais
TC	Transport Canada



## Disclaimer

Stantec Inc. and Innovation 7 contributed to the preparation of parts of this document. Any errors or omissions in this document are the responsibility of PSPC and the NCC



## INTRODUCTION

The Detailed Project Description (DPD) was written in compliance with *the Impact Assessment Act, Schedule 1 of the Information and Management of Time Limits Regulations* and all other related legislations, policies and guidelines.

The DPD forms part of the preliminary planning stage of the Alexandra Bridge Replacement Project (the Project) and is required as part of the planning phase of the Impact Assessment Process. Content of the DPD represents information available at the time of writing.

Public Services and Procurement Canada (PSPC) is working in close collaboration with the National Capital Commission (NCC) in leading the Project. Together, they are referred to as the Integrated Project Team (IPT). The Project involves the deconstruction and reconstruction of one of the National Capital Region's (NCR) Interprovincial Crossings, the Alexandra Bridge, which serves as an integral transportation link, essential to the mobility planning in both Ottawa and Gatineau.

As part of pre-planning, the IPT has undertaken several studies and assessments, consultation with Indigenous communities, key stakeholders and the public. This report provides a starting point for meaningful engagement with project stakeholders, summarizes preliminary findings, and identifies proposed mitigation measures that may be implemented to minimize the potential impacts of the project on the environment, Indigenous communities, health, social and economic conditions of the NCR.

Given that the Project is located within the NCR, the Project is also subject to the Federal Land Use, Design and Transaction Approval (FLUDTA) process, regulated by the NCC under the *National Capital Act*. In this region, work by federal departments, works on federal lands as well as the sale and/or transfer of federal lands are subject to the NCC's approval. The NCC evaluates applications based on the conformity with relevant legislation, federal plans, policies, public and stakeholder feedback, and discussions with Indigenous communities, as well as applicable design guidelines (see Section 18.1 for details on the process).

To date a federal approval has been granted for the Project's Planning and Design Principles (June 2021 see [Appendix G](#)). The FLUDTA process will include multiple rounds of review and approval, corresponding to the various stages of planning as well as design and construction of the Project (Sections 1.1 and 13). All stages of the Alexandra Bridge Replacement Project are classed as Level 3 Project, the highest-level classification for Federal Approvals. Level 3 Projects are subject to a comprehensive land use and design review, with input from the NCC's Advisory Committee on Planning Design and Realty (ACPDR) and the NCC's Advisory Committee on Universal Accessibility (ACUA), as part of the federal approval process. Authorizations from other federal and provincial regulators will also be required for the Project. Mitigation strategies, including monitoring their implementation and effectiveness, will seek to achieve no significant negative long-term impacts from the Project.



## Part A: Updated General Information

### 1 PROJECT DESCRIPTION

The *Alexandra Bridge Replacement Project* (the Project) is the proposed replacement of an existing interprovincial bridge structure crossing the Ottawa River between the provinces of Ontario and Quebec. The bridge is located at the heart of the National Capital Region (NCR) and is owned and managed by Public Services and Procurement Canada (PSPC). The existing bridge, sometimes also referred to as the Royal Alexandra Interprovincial Bridge, was first opened as a crossing in 1901. It is a true pin steel truss structure, supported by six piers composed of concrete and masonry. The bridge crosses the Ottawa River from Kiweki Point (formerly named Nepean Point), just west of Ottawa's Byward Market, to the Canadian Museum of History in the Hull district of Gatineau.

The Alexandra Bridge is a key piece of regional transportation infrastructure and is integral to mobility planning in both cities and the region. It also has a unique heritage and aesthetic value due to its location and history, as well as physical and visual connections to both sides of the river. Its position relative to the Parliamentary Precinct and Rideau Canal underscores its significance to the region's residents and visitors alike and makes the bridge a destination in its own right for special events such as ceremonies and races. Additionally, the Bridge forms an inherent part of Confederation Boulevard, the Capital's ceremonial and discovery route, which connects many sites and symbols of national significance and forms a loop that connects both sides of the Ottawa River, linking Ontario and Quebec.

A Lifecycle Cost Analysis (LCCA), produced by MMM Group Ltd in 2018 provides cost comparisons between maintaining the bridge or replacing it. The analysis concluded that its replacement would be more economical than continuing to maintain the existing structure indefinitely and that it would present less risk to public safety.

As directed by the Federal Government as part of Budget 2019, PSPC and the NCC are working to develop a holistic strategy to ensure that the five (5) interprovincial crossings in the NCR remain safe and open for use by residents and visitors. This strategy includes pre-planning for the replacement of the Alexandra Bridge.

Of note, as part of this stage, Indigenous communities and the public were engaged early to identify values, issues, and concerns, as they relate to the Project. Engagement with Indigenous communities and stakeholders will continue for the life of the Project. Their input will inform key elements that will contribute to the Project's planning, design and construction.

In addition, the Project will align with the Federal Government's plans and priorities, including the Federal Government's Greening Government Strategy (2020).

## 1.1 Regulatory and Project Terminology

The proposed Project is currently in the pre-planning stage. As part of this stage, the IPT has commenced required studies/assessment and other planning activities, to proceed with the Project. There are multiple regulatory processes, as well as planning and design aspects, of this Project progressing simultaneously. Within the accompanying DPD and for simplicity, the term “phases” will refer to the Impact Assessment process to align with the Impact Assessment Agency of Canada’s (IAAC) terminology. The term “stages” is used to refer to the unique pre-planning, planning, design and construction components of the Project.

Table 1-1 outlines the Impact Assessment phases as well as the Project stages and the approval steps, in relation to the Federal Land Use, Design and Transaction Approval (FLUDTA) process at proposed timelines.



**Table 1-1: Alignment of IA and FLUDTA processes with design and construction of the bridge.**

Year	IA Phases (Phases)	Project Planning and Design (Stages)	FLUDTA Process
2021		Planning and Design Guidelines	Step 1 – Initiation Online Application FLUDTA – Approval of Planning and Design Principles
2022	1-Initial Project Description (IPD)/Detailed Project Description (DPD)		
2023	Tailored Impact Statement Guidelines 2- Impact Statement	Concept Design	FLUDTA – Approval of Concept Design
2024	3- Impact Assessment	Functional Design (33%)	FLUDTA – Approval of 33% Functional Design
2025	4- Decision Making	Preliminary Design (66%)	FLUDTA – Approval of 66% Preliminary Design
2026	5- Post-Decision Monitoring and Adaptation (2026 – Onwards)	Detailed Design (100%) Completed/ Regulatory Approvals (Transport Canada, Fisheries Canada, Provincial Land Use Authorization)	FLUDTA – Approval of 100% Detailed Design, Includes IA
2027		Construction tender	Decision with conditions and other approvals
2028		Construction and deconstruction stage (2028-2032)	Monitoring and Adaptation to meet conditions of approvals (2028-2032)
2029			
2030			
2031			
2032 - Onwards	Operation and Maintenance		



## 2 PROPONENT CONTACT INFORMATION

The Project Proponent is PSPC who is working in collaboration with the NCC, forming an Integrated Project team (IPT).

Note that the individuals identified below should be included in correspondence regarding this Project. Correspondence may be provided in either official language to the IPT, as identified in Table 2-1: Proponent contact information.

**Table 2-1: Proponent contact information**

<b><u>Public Services and Procurement Canada</u></b>	<b><u>National Capital Commission</u></b>
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## Part B: Planning Phase Results

### 3 SUMMARY OF ISSUES AND COMMITMENTS

#### 3.1 Summary of Issues

The Summary of Issues (Table 3-1) provides the IPT's responses to the high-level issues documented by the Impact Assessment Agency of Canada (IAAC) based on the comments received during the public review period for the Initial Project Description. The issues highlight information needed to support the Agency's decision on whether an impact assessment is required under section 16 of the *Impact Assessment Act* and, if an assessment is required, to inform the planning phase documents and further assessment. Original submissions are posted on the Canadian Impact Assessment Registry (Reference Number #83444).

The IPT recognizes that the Project is within the traditional territory of the Algonquin Nation and that Indigenous communities have historic and continued use of the area. The IPT looks forward to engaging with interested Indigenous communities to gather Indigenous knowledge that will contribute to the assessment of potential biophysical impacts as well as identification of potential impact to the social, health and economic condition of Indigenous communities. Engagement of Indigenous communities is essential to collect and validate Indigenous knowledge that will be integrated with scientific knowledge in the identification of potential impacts, the development of mitigation strategies, as well as the crafting of enhancement measures, site restoration and compensation if required.

The IPT will engage Indigenous communities through all stages of the planning, design, construction and operation of the Project including to:

- provide opportunities for Indigenous communities to contribute to the design of the replacement bridge as well as evaluation of alternative alignments
- seek opportunities to include Indigenous knowledge along with information collected from various studies in consideration of potential impacts, mitigation strategies, enhancement measures, site restoration and compensation if required
- support Indigenous communities in conducting their own studies to contribute to the assessment of potential impacts and development of strategies to avoid or mitigate the impacts

Economic benefits from the Project will flow mainly from participation by Indigenous people and businesses in the contracting and work opportunities stemming from every stage of the Project.



**Table 3-1: Summary of Issues**

	Categories of issues	Integrated Project Team Responses
	<b>Accidents and Malfunctions</b>	
1	<p>Need for further details on potential accidents and malfunctions, including activities with potential to release chemicals or pathogens to the environment, information on proposed accident and malfunction avoidance or preparedness plans, and corresponding mitigation measures.</p>	<p>The IPT (Integrated Project Team) will require the contractor to develop an Environmental Protection Plan. The Environmental Protection Plan will outline potential risks and proposed environmental protection measures and commitments. These measures will be carried out by the contractor during deconstruction and construction to avoid, reduce or mitigate potential effects.</p> <p>Section 22 was developed to describe the process that will be used to identify potential risks, mitigation measures and relevant federal, provincial or municipal acts, standards and guidelines that provide direction related to activities with the potential to release contaminants to the environment. Additional details regarding four plans are provided in Section 22 :</p> <ul style="list-style-type: none"> <li>• Accident and Malfunction Response Plan</li> <li>• Spill Response Plan</li> <li>• Material Management Plan</li> <li>• Erosion and Sediment Control (ESC) Plan</li> </ul> <p>The goal of these plans is to prevent accidents and unplanned releases to the environment through the implementation of prevention, mitigation and control measures. The IPT will encourage the contractor to limit the use of chemicals and fuels on the site to the minimum amount required. The contractor will also be required to implement barriers to transmission like silt fences, check dams or straw bale filters. Environmental monitoring will be implemented to confirm appropriate measures are in place and functioning during the construction stage.</p> <p>If spills occur in Ontario, the Ministry of the Environment, Conservation and Parks (MECP) Spills Action Centre (1-800-268-6060) will be contacted, and all reasonable corrective action will be taken to contain and clean the spill immediately.</p>

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		<p>If spills occur in Québec, the équipes régionales d'intervention Urgence-Environnement (1 866 694-5454) of the Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks (MEFCCWP) will be contacted and all reasonable corrective action will be taken to contain and clean the spill immediately.</p> <p>Excess soils, sediment, waste material and hazardous materials will be treated in accordance with relevant federal and provincial Acts, Regulations and Guidelines. Public Services and Procurement Canada (PSPC) also has internal standards for work.</p>
2	<p>Need for further information on potential effects (including effects on human health, vegetation, surface water, fish and fish habitat, migratory birds, wildlife, and species at risk) of accidents and malfunctions (spills of hazardous substances or uncontrolled release of pollutants to the environment), including consideration of existing contamination in the Ottawa River watershed.</p>	<p>The IPT plans to conduct studies of the physical environment to characterize current biophysical conditions. These studies include vegetation surveys, migratory bird studies, terrestrial wildlife surveys, and fish and fish habitat assessment. Potential effects will be better understood when these surveys are complete, planned for 2023.</p> <p>Risks will be addressed through a series of plans identified above, within the IPT's response to issue # 1.</p>
<b>Acoustic Environment</b>		
3	<p>Concerns about potential effects to fish, birds, and other wildlife from potential increase in noise levels during deconstruction of the existing bridge and construction of the new bridge.</p>	<p>Wildlife and wildlife habitat protection and mitigation measures will be included as a component of the EPP to identify specific wildlife protection measures to be implemented during construction. Wildlife potentially present adjacent to the active construction site are species that are already acclimatized to the disturbed urban environment and impacts to these species from increased noise are expected to be low.</p> <p>The IPT will work with Indigenous communities to contribute Indigenous Knowledge to identify species of concern, determine potential sources and magnitude of impacts of acoustic noise, establish monitoring protocols and possible mitigation strategies as appropriate.</p>



	Categories of issues	Integrated Project Team Responses
<b>Alternatives Assessment (including Alternatives to the Project and Alternative Means)</b>		
4	<p>Need for further details and analysis on alternatives, including a comparison of the environmental (e.g., greenhouse gas emissions), health, social, cultural, and economic effects of various alternatives.</p>	<p><b>Alternatives to the Project (Section 10.1 Alternatives to the Project)</b></p> <p>Many factors were considered to support the recommendation and decision to replace the bridge. Ensuring public safety over the long-term was a key consideration in the decision.</p> <p>The bridge currently has a rating of “inadequate” (rating of 2 on a scale of 1 to 6). For the bridge to be retained and maintained over the next 75 years, the rating would need to be increased to “fair” (rating of 4) within 5 years to achieve PSPC’s standard for bridges.</p> <p>Significant repairs over a 10-year period were foreseen to achieve the required standard. Because of the nature of the bridge construction, the extent of the repairs was not fully known but were anticipated to be costly and would require significant closures of the bridges to complete the work. Some repairs could also have impacted the heritage values of the bridge. Maintaining the bridge presented a high level of execution uncertainty and risk and could have required deconstruction of certain spans of the bridge to replace members. Thus, repairing the bridge was deemed an unacceptable alternative given the high level of risk and uncertainty in terms of time, cost, unknown complexity and whether even if repairs would indeed result in an improvement in the bridge rating following implementation.</p> <p>Deloitte LLP (March 2022) was retained to analyze the socio-economic impacts associated with the closures of the Alexandra Bridge given two scenarios: “rehabilitation” or “replacement.”</p> <p>The socio-economic impacts were analyzed with respect to four categories:</p> <ul style="list-style-type: none"> <li>• Transport user impacts (i.e., delays, vehicle operating costs, and health benefits for active transportation users);</li> <li>• External impacts (i.e., air quality, environment, and road safety);</li> <li>• Local business impacts (i.e., changes in revenues); and</li> <li>• Economic impacts of the bridge closures (in terms of gross domestic product (“GDP”), labour income, and employment), based on changes in local business revenues.</li> </ul>

	Categories of issues	Integrated Project Team Responses
		<p>Table 10-3 provides a comparison of the environmental, health, social, cultural, and economic effects of the alternatives.</p> <p><b>Alternative means (Section 10.2 Alternative Means to Project Execution)</b>  The final decision on the alignment of the bridge (curved or straight) has not been made. Evaluation criteria are under development to support the decision on the alignment of the new bridge.</p>
5	<p>Requests to consider that the new bridge be dedicated exclusively for the use of public transit and active transportation.</p>	<p>Improving the safety, comfort and accessibility of active transportation is a key objective of the Project. The mission statement of the replacement bridge, as defined within the 2021 Planning and Design Principles is “to create a sustainable interprovincial transportation connection that will prioritize active mobility and highlight the symbolic importance of the site to all Canadians for many generations to come”.</p> <p>During development of the Planning and Design Principles and engagement with key stakeholders, the minimum functional requirements for the replacement of the bridge included two lanes for vehicle traffic (one in each direction) designed to be adapted in the future for public transit via a tram or light rail system. The requirements also include a bidirectional lane for active mobility with separation of pedestrians and cyclists.</p> <p>Given the long-term planning horizon of interprovincial public transit improvements, the functional requirements analysis concluded that keeping the bridge to 2 vehicular lanes was preferred given that it:</p> <ul style="list-style-type: none"> <li>• fits within the available space on both approaches</li> <li>• respects the municipalities’ (Ottawa and Gatineau) desire to not add traffic capacity to the link</li> <li>• reduces the risk if the Interprovincial Transit Loop (tram) or the STO LRT does not get extended across the replacement bridge during its service life.</li> </ul> <p>In addition, it is important to create better active mobility network connections both across the river, but also between the new bridge and the shorelines.</p>



	Categories of issues	Integrated Project Team Responses
6	Requests from Indigenous groups for increased consultation efforts from the Proponent in the consideration of alternatives assessment for the Project.	<p><b>Section 10.2 Alternative Means to Project Execution</b></p> <p>Indigenous communities will be engaged in discussions to contribute to the evaluation of Alternative Means to complete the Project. The IPT will provide opportunities for Indigenous communities to contribute to the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments.</p> <p>The replacement of the Alexandra Bridge was announced in Budget 2019, which stated “to ensure that these interprovincial crossings remain safe and open for residents and visitors, Budget 2019 proposes to: Replace the Alexandra Bridge, as it is now more than 100 years old and needs to be replaced. The new Alexandra Bridge will provide long-lasting economic benefits to the communities on each side of the Ottawa River and more broadly to the region as a whole.”</p> <p>The decision to replace the bridge has also been confirmed in minister’s mandate letters, dated 2019 and 2021.</p>
<b>Climate Change and Greenhouse Gas Emissions</b>		
7	Need for details related to the volume, transportation, disposal or destruction of wood chips and contaminated soils during deconstruction of the existing bridge and construction of the new bridge, and a calculation of greenhouse gas emissions associated with it.	A greenhouse gas analysis is planned in 2025 to assess emissions associated with all aspects of the Project. The volume of wood chips and contaminated soil and sediment depends on bridge design parameters that will be better-defined at the time of the 2025 analysis.
8	Request from Indigenous groups for the Proponent to include Indigenous Knowledge in the assessment of climate change and greenhouse gas emissions.	The IPT looks forward to working with Indigenous communities to develop an approach to collect Indigenous Knowledge to be integrated in the climate vulnerability and risk assessment. Then, together, determine how the knowledge will contribute to mitigating and planning for the impacts of climate change.



	Categories of issues	Integrated Project Team Responses
<b>Cumulative Effects</b>		
9	Need for further information on other past, present, and future physical activities in the Ottawa River watershed, and further information related to potential cumulative effects on Indigenous peoples and their Aboriginal and/or treaty rights, and how these effects would be addressed.	<p>Valued components (VC) and their spatial boundaries will be reviewed and confirmed as the Project becomes better defined at the design stages. This will provide opportunities to identify valued components of concern to Indigenous communities and to establish appropriate boundaries for the assessment of impacts from the Project.</p> <p>The spatial boundaries for the cumulative assessment on VCs of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in their existing characteristics.</p>
<b>Effects of the Environment on the Project</b>		
10	Need for further information on the resilience of the Project to climate change including potential effects of weather extremes (e.g., flooding) on the Project.	<p>A Climate Risk and Vulnerability Assessment (CRiVA) is planned in 2023/24. This study would include information on the resilience of the Project to climate change including effects of weather extremes on the Project.</p> <p>Highest sustainable development standards for a climate-resilient bridge will be achieved by aligning the bridge design with applicable federal strategies and targets. Future bridge design(s) will be reviewed to assess how it incorporates climate change risks to better withstand severe weather including floods, earthquakes and other possible extremes, linked to climate change.</p>
<b>Fish and Fish Habitat</b>		
11	Need for further information on potential effects to and proposed approach to management of fish and fish habitat, including species at risk, species native to the Ottawa River and the Rideau Canal, and species of importance to Indigenous groups, from deconstruction of the existing bridge and construction of the new bridge, as well as an overview of how the requirements of the <i>Fisheries Act</i> would be met.	Detailed information on the potential effects of the Project on fish and fish habitat and on the proposed approach for the management of this VC is not available at this stage of the Project. As mentioned in <b>Section 15.2.3 Aquatic Environment</b> and <b>Table 15-9: Planned studies</b> , fish and fish habitat surveys will be undertaken within the Project area to provide baseline information required to fully assess the potential impacts of the Project. The results of these surveys will potentially influence the bridge design and methods of construction, which will be developed during the design stages of the Project. This information is in turn required to determine the detailed potential effects of the Project on fish and fish habitat, as well as to develop a management approach to protect this VC and ensure compliance with the Fisheries Act, the Species at Risk Act, and other federal and



Categories of issues	Integrated Project Team Responses
	<p>provincial legislation. DFO, the MNRF and MEFCWP will be consulted regarding regulatory compliance and permitting requirements.</p> <p><b>Revised text for Section 15.2.3.3</b></p> <p>A more detailed assessment of the potential impacts of the Project on fish and fish habitats, including SAR, species native to the Ottawa River and the Rideau Canal, and species of importance to Indigenous communities, will be completed based on the findings of future fish surveys (see <b>Section 15.2.3.3</b>) and following the development of the initial designs stages and the construction methods.</p> <p><b>Revised text for Section 15.2.3.4 Mitigation and Protective Measures</b></p> <p>Field surveys will be conducted prior to the initial design stages to identify the presence of fish (including SAR/SOMC) and fish habitat (including aquatic, semi-aquatic and riparian habitats) within the Project area. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p> <p>After field surveys are conducted and a list of aquatic species, SAR/SOMC and potential fish habitat is identified, species-specific mitigation measures and permit requirements will be identified, and a management approach will be developed. Detailed mitigation measures, the management approach and follow-up programs will form part of the EEP.</p>



	Categories of issues	Integrated Project Team Responses
<b>Geology and Soils</b>		
12	Need for further baseline information, including maps and diagrams, of groundwater, soil, sediment, and wood chips layers across the riverbed, including mapping and delineation of any contamination plumes near the Project.	<p>WSP conducted a Phase II ESA and a geotechnical study of the Project area (WSP, 2021a). These reports provide information related to soil and sediment conditions for bridge construction. Sufficient information is available about the soil, groundwater and sediment conditions to begin planning for the deconstruction and construction of the future bridge.</p> <p>Further delineation of contaminants may be required as part of future studies (e.g., as part of an assessment of the Project by DFO under the <i>Fisheries Act</i>).</p>
<b>Heritage and Historical Context</b>		
13	Potential effects on cultural heritage, including effects on built heritage resources and/or cultural landscapes around the Project location.	<p><b>16.4.2 Design and Heritage of Structure, Mitigation and Protective Measures</b> provides details of the Heritage Impact Analysis (HIA) anticipated to be completed for the Project. The HIA is planned to help inform the conservation decision-making process by assessing the value of the Alexandra Bridge within its broader cultural landscape setting, and providing a comprehensive understanding of the heritage value and character-defining elements unique to the structure and its cultural landscape setting.</p> <p>The Terms of Reference for the HIA will be shared with key stakeholders and Indigenous communities to invite comments. The HIA is anticipated to be initiated by early 2023.</p>
14	Need for further information on how the new bridge will commemorate the legacy, design, historical context, and heritage of the existing bridge.	<p>This HIA will propose approaches to ensure that the values and elements unique to the structure and its cultural landscape setting are protected with any future intervention.</p> <p>In addition, Heritage Recording of the Alexandra Bridge will document and record all elements of the existing structure.</p> <p>Given the importance of the Alexandra Bridge’s iconic heritage assets and impact of design and retention, PSPC is requesting that the Royal Architecture Institute of Canada (RAIC) establish a peer review panel, which will be engaged to provide independent advice to enable an appropriate response to the requirements for the preservation of heritage elements in the new build. The heritage elements are not limited to physical elements, but can also include people (the original designer/builder or prominent figures), place (the actual design) or story (how it contributed to Canada or local economy, or culture).</p>

	Categories of issues	Integrated Project Team Responses
15	Need for further information on potential effects of the Project on archaeological resources, including underwater archaeological resources.	<p><b>Section 16.5.2 Archaeological Potential, Mitigation and Protective Measures</b> indicate that a detailed archaeological study will be undertaken to identify all known archaeological resources and areas of pre-contact and historical archaeological potential to be avoided by Project work as well as to determine remediation measures (e.g., rescue excavation and monitoring) for zones of archaeological sensitivity that cannot be avoided.</p> <p>These studies are also documented in <b>Table 15-9: Planned studies</b></p>
16	Need for technical heritage studies, such as archaeological assessments, cultural heritage evaluation, heritage impact assessment, and heritage value assessment, to be completed by qualified persons.	<p>Please see responses to issues 13, 14 and 15.</p> <p>The HIA, the Heritage Recording and archaeological studies will be completed by qualified professionals.</p>
17	Need for information on potential impacts of the Project on Rideau Canal (UNESCO World Heritage Site), Ottawa River (Canadian Heritage River), or properties designated under Parts IV and V of the <i>Ontario Heritage Act</i> .	<p>Information on the potential effects of the Project on sites of national significance in the vicinity of the Project and on the proposed mitigation measures is not available at this stage of the Project. Potential impacts to sites such as Parliament Buildings, as well as national cultural symbols such as the Rideau Canal locks, Kiweki Point (formerly named Nepean Point), Major's Hill Park, Lady Grey Drive, and Jacques-Cartier Park will be evaluated in the initial design stages.</p> <p>Traffic management and communication plans, including mitigating heavy truck traffic in anticipation of impacts related to traffic volumes will be completed once the initial design stages and deconstruction approach are better defined. Detours will seek to avoid these sites or minimize disturbance to them as much as possible.</p>
<b>Human Health and Well-Being (non-Indigenous)</b>		
18	Need for further information on the chemicals that would be used for dust management during deconstruction of the existing bridge and construction of the new bridge.	<p>The IPT expects that construction specifications for the Project will require the contractor to submit a Dust Management Strategy and Air Pollution Control Plan. The strategy will show how dust generated from construction activities will be mitigated and address such issues as weather events. Minimizing dust may also require specifying the use of power tools with effective dust collection systems to collect spent material.</p> <p>Dust will also be managed through the contractor's Erosion and Sediment Control Plan. Limiting soil erosion and the discharge of soil-bearing water is an important dust-control</p>

	Categories of issues	Integrated Project Team Responses
		<p>measure.</p> <p>Water may be used for dust suppression. Amendments such as calcium chloride may be used in accordance with any limitations laid out in plans for working near water as part of a potential Fisheries Act approval for the Project.</p>
19	<p>Clarity on which parks and greenspaces near the Project would be affected during deconstruction of the existing bridge and construction of the new bridge.</p>	<p><b>Figure 14-7: Green spaces in vicinity to the Project</b></p> <p>The IPT acknowledges the concern for continued access to the green spaces in the vicinity of the Project and will include it for consideration in planning construction related activities (detours, traffic management and others). Plans will be shared with stakeholders as part of the engagement process.</p> <p>Review of lands required for staging during deconstruction and construction will occur as part of the design stages. Plans will include appropriate mitigation and reinstatement measures to protect capital parks, greenspaces and shorelines.</p>
<b>Inadequate Documentation</b>		
20	<p>Request to include potential environmental effects and concerns heard from all the Indigenous groups in the body of the report.</p>	<p><b>Table 5-1: Summary of the Key Issues Raised by Indigenous Communities</b> provides a summary of all issues and concerns raised to date by Indigenous communities.</p>
<b>Indigenous Engagement</b>		
21	<p>Need for details regarding how Indigenous groups will be involved in the identification and mitigation of potential social, economic, and health impacts from the Project.</p>	<p>Indigenous communities will be involved in every aspect of the Project assessment, according to their level of interest. At this early point, communities have indicated that they are not ready to specify or stipulate mitigation or accommodation measures until they know more about the Project through reviewing studies procured by the IPT and through their own studies.</p>

The process followed by the IPT includes:



	Categories of issues	Integrated Project Team Responses
		<ul style="list-style-type: none"> <li>• Sharing draft terms of reference for each study with Indigenous communities;</li> <li>• Supporting Indigenous communities to participate in the studies, including the opportunity to conduct their own studies;</li> <li>• Integrating the results of the input from Indigenous communities into the Project reports;</li> <li>• Using the information from Indigenous communities to inform each step of the bridge planning work.</li> </ul> <p>The IPT will ask the Indigenous communities to express their views on the mitigation measures and will work with them to explore mitigation and accommodation that will address their concerns. Mitigation measures will be monitored to ensure effectiveness. Monitoring data and adaptation of the implementation of mitigation measures will be shared with interested communities.</p>
22	<p>Need for further information on how Indigenous groups will be involved by the Proponent and how Indigenous knowledge (including Traditional Ecological Knowledge) will be gathered and utilized in the Project, including in the development of study areas, design of the Project, surveys and baseline studies for fish, migratory birds, and species at risk, management and monitoring plans.</p>	<p>The IPT will engage interested Indigenous communities to contribute Indigenous Knowledge that would support the Project assessment. Funding is available to Indigenous communities by the proponent to facilitate gathering of Indigenous Knowledge, including TEK and inclusion of this information in the Project assessment and studies.</p> <p>The IPT will accommodate and support each Indigenous communities' unique approach to the subject matters.</p>
23	<p>Request from Indigenous groups for increased consultation, including establishing agreements where applicable, in relation to the Project.</p>	<p>The IPT is prepared to work with Indigenous communities at their pace to establish agreements, provide funding to support participation in engagement, and increase the level of consultation as required.</p>

The IPT has developed a standard Collaboration Agreement to facilitate the relationship



	Categories of issues	Integrated Project Team Responses
		<p>with Indigenous communities. The Agreement is intended to:</p> <ul style="list-style-type: none"> <li>• Create the venue for collaboration</li> <li>• Provide principles for collaboration</li> <li>• Define key terms</li> <li>• Describe a governance process including working group membership, meetings, decision-making, roles, methods to resolve disputes, and key communication contacts</li> <li>• Summarize the mutual commitments related to the provision of funding by PSPC/NCC and the responsibilities of the Indigenous communities to use the funds for the agreed purposes</li> <li>• Establish procedures for the treatment of confidential information.</li> </ul> <p>Attached to each Collaboration Agreement is a Schedule with a multi-year work plan and budget outlining how the Indigenous communities will use the funds provided by the IPT to participate in the crossings program of work, which may include such categories as support for staffing and other internal capacity, hiring external advisors, purchasing equipment, support for community involvement in Indigenous knowledge studies, and other similar requirements.</p> <p>The work plan is the appropriate place to identify specific activities, such as the undertaking of a Cumulative Effects Study by an Indigenous community.</p> <p>It is understood that the work plans and budgets will be reviewed and updated regularly, including increases to the budgets as appropriate.</p> <p>All communities listed in <b>Section 5.3</b> were offered funding to support their engagement.</p>
24	Need for further details on how the Proponent will discuss economic benefits with potentially impacted Indigenous groups with respect to the Project.	<p>The IPT will co-develop Indigenous Participation Plans with Indigenous communities and the private sector to identify opportunities for economic benefits and to work with the communities and Indigenous businesses to realize the benefits. Funds are available from the proponent for Indigenous communities to identify the current level of skills, capacities and interests among their members and to determine priorities for future growth such as training, education and skills development. Targets for Indigenous participation will be established with the Indigenous communities, based on interest and capacity. Most of the</p>

	Categories of issues	Integrated Project Team Responses
		<p>benefits are expected to result from contracting activities for the removal of the existing bridge and construction of its replacement. Indigenous communities will receive information in coming months about the expected requirements for these contracting activities and what support is available to build capacities to take advantage of the opportunities.</p> <p>Outreach is occurring with the economic development officers in Indigenous communities who have the best information about the skills, capacities and ambitions of community members. The IPT is also working with Indigenous organizations that manage funding from the Government of Canada for skills and training to bring their resources and expertise to the partnership.</p>
	<b>Indigenous Peoples' Current Use of Lands and Resources for Traditional Purposes</b>	
25	<p>Potential effects on the current use of lands and resources for traditional purposes, such as hunting, fishing, and gathering due to potential adverse effects of the Project on fish populations, vegetation (e.g., berries, plants, mushrooms, highbush cranberry, medicinal plants, etc.) and wildlife.</p>	<p>Additional studies are anticipated to be required to complete the design and construction planning. During this stage of the Project, the IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed to support the Project assessment.</p> <p>An update of the desktop review will be initiated in winter 2022/spring 2023. The review will gather additional information published since the preliminary work for the development of the Initial Project Description was completed. This work will provide an opportunity to engage with Indigenous communities to gather knowledge from available reports, maps or any other source materials (that are acceptable to be shared) that may hold Indigenous Knowledge to wards the assessment of potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.</p> <p>The additional information, including Indigenous Knowledge gathered in the desktop review, will contribute to a more detailed understanding of data gaps that require further investigation to evaluate potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage the Project may have.</p>

	Categories of issues	Integrated Project Team Responses
	<b>Indigenous Peoples' Health and Well-being</b>	
26	<p>Potential effects of the Project on the health of Indigenous peoples from changes in drinking water quality, air quality and consumption of traditional foods. Need for further information on proposed mitigation measures and monitoring plans for the effects.</p>	<p>Potential impacts to human health from the Project and mitigation strategies are described in <b>Section 16.3 Human Health Context</b></p> <p>The IPT is committed to continue to consult with the Indigenous communities and organizations throughout the life of the Project. Indigenous communities will be encouraged to bring up issues and concerns as they are identified.</p> <p>The Project is in an urban environment and potential impacts would likely be minimal, have a short term and be reversible. Further, the IPT has no information regarding harvest of traditional foods near the bridge but will engage with Indigenous communities to determine the nature and extent of these activities.</p> <p>Being in an urban environment, drinking water quality is not anticipated to be affected by the Project. Drinking water systems in both Ottawa and Gatineau are operated under rigorous and comprehensive quality management systems. The systems are mandated under the Ontario's Safe Water Drinking Act, 2002 for Ottawa and the Règlement sur la qualité de l'eau potable for Gatineau.</p> <p>In the design stages of the Project when more detailed information is known about the Project components, a Human Health Risk Assessment (HHRA) will be completed following Health Canada Guidance documents, if required. Specifically, the following guidance documents will be referenced to determine the need for additional assessments:</p> <ul style="list-style-type: none"> <li>• Health Canada, 2017. Guidance for evaluating human health impacts in Environmental Assessment: Drinking and recreational water quality.</li> <li>• Health Canada, 2017. Guidance for evaluation human health impacts in Environmental Assessment: Country foods.</li> <li>• Health Canada, 2019. Guidance for evaluating human health impacts in environmental assessment: Human health risk assessment.</li> </ul>
27	<p>Potential or perceived impacts of the Project on mental health and well-being of Indigenous groups.</p>	<p>The IPT is committed to continue to consult with the Indigenous communities and organizations throughout the life of the Project. Indigenous communities will be encouraged to bring up issues and concerns as they are identified.</p>





	Categories of issues	Integrated Project Team Responses
<b>Indigenous Peoples' Social and Economic Conditions</b>		
28	Request for the Proponent to provide economic benefits and opportunities for Indigenous communities throughout the lifecycle of the Project, including during operation of the new bridge.	Economic benefits will be available throughout the life cycle of the Project, including opportunities for Indigenous businesses and people to be involved in contracts issued for the planning phase of the replacement bridge, removal and replacement of the bridge, and several decades of bridge maintenance and operations.
29	Need for further information on how the Proponent will ensure Indigenous peoples will have access to training and apprenticeship opportunities in relation to the Project.	Outreach is occurring with the economic development officers in Indigenous communities who have information about the skills, capacities and ambitions of community members. The IPT is also working with Indigenous organizations that manage funding from the Government of Canada for skills and training to bring their resources and expertise to the partnership. The IPT will work with Indigenous communities to build alliances with training institutes, apprenticeship programs, unions and contractors associations based on the interests and ambitions of the Indigenous communities.
30	Potential impacts to cultural and archaeological heritage and resources near the project area (e.g., Chaudière Falls and Victoria Island, which are culturally significant sites for Indigenous groups).	The IPT will engage with Indigenous communities to understand the cultural values and practices which could lead to the co-development of approaches to minimize potential impacts during the deconstruction and construction of the new bridge.
31	Potential impacts on cultural values of Indigenous communities, including effects to cultural and spiritual practices conducted near the project area, during deconstruction of the existing bridge and construction of the new bridge.	The IPT will engage with Indigenous communities to understand those areas that fall under the Project area where cultural values and practices may be conducted. The IPT will discuss opportunities to co-develop approaches to minimize potential impacts during the deconstruction and construction of the new bridge.
32	Need for details on how Indigenous peoples will retain access to important sites near the project area, including sites used for traditional practices.	The IPT will engage with Indigenous communities to identify access points to important sites near the Project area and take those into consideration during the planning for construction related activities and in the design of the replacement bridge.



	Categories of issues	Integrated Project Team Responses
33	Need for further information on how the Proponent will work with Indigenous groups to preserve discovered archaeological resources.	<p>For the protection and conservation of archaeological resources on federal lands, the NCC has an established protocol with Kitigan Zibi Anishinabeg Nation and Algonquins of Pikwakanagan First Nation for the co-management of archaeological resources (March, 2017) which describes the guiding principles that will be followed for the Project. The goal of the current protocol is to ensure that the archaeological interests and concerns of Algonquin Nations are addressed in a respectful, inclusive and appropriate manner. The IPT will work with interested Indigenous communities to provide opportunities for meaningful engagement.</p> <p>Archaeological resources occurring on provincial lands will also be managed in accordance with applicable provincial legislation.</p> <p>The existing protocol relates to all aspects of the relationship between the NCC and two communities on behalf of Algonquin Nations. Accordingly, it is not appropriate to extend participation in this particular protocol to all of the Indigenous communities that may be impacted by the Project or have an interest in archaeological resources of the site.</p> <p>The IPT acknowledges that other Indigenous communities may have an interest in the archaeological field work. The IPT will work with interested Indigenous communities to provide opportunities for meaningful engagement.</p>
34	Need for further information on how Algonquin culture will be incorporated into the design of the new bridge.	The IPT will engage with Indigenous communities, particularly with the Algonquin Nation as the host Nation of the Ottawa-Gatineau Region, to discuss perspectives, values and cultural elements that could be integrated into the design of the new bridge.
<b>Migratory Birds</b>		
35	Potential effects to migratory birds and their habitat, including effects to breeding, nesting, migration and overwintering, due to physical or sensory disturbances during deconstruction of the existing bridge and construction of the new bridge. Need for further information on proposed mitigation measures for these effects.	Detailed information on the potential effects of the Project on migratory birds and on the proposed mitigation measures is not available at this stage of the Project. As mentioned in <b>Section 15.2.2 Wildlife and Wildlife Habitat and Table 15-9: Planned studies</b> , wildlife surveys, including breeding bird, migratory bird and local bird population surveys, will be undertaken within the Project area to provide baseline information required to fully assess the potential impacts of the Project. Survey timing windows will be modified to include the migration and overwintering seasons. The results of these surveys will potentially influence the bridge design and methods of construction, which will be developed during the design

Categories of issues	Integrated Project Team Responses
	<p>stages of the Project. This information is in turn required to determine the detailed potential effects of the Project on migratory birds, as well as to develop a management approach to protect this VC and ensure compliance with the Migratory Birds Convention Act, the Species at Risk Act, and other federal and provincial legislation.</p> <p><b>Revised text for Section 15.2.2.3 Potential Impacts</b>  A more detailed assessment of the potential impacts of the Project on local and migratory terrestrial wildlife populations and their habitats, including SAR/SOMC and migratory birds, will be completed based on the findings of future wildlife surveys and following the development of the initial design stages and construction methods.</p> <p><b>Revised text for Section 15.2.2.4 Mitigation and Protective Measures</b>  Wildlife and wildlife habitat protection and mitigation measures will be included as a component of the EPP to identify specific wildlife protection measures to be implemented during construction. This plan will include a variety of measures to be implemented during design and construction of the Project, such as adherence to wildlife timing windows, species monitoring, and wildlife handling protocols.</p> <p>Field surveys will be conducted in the initial design stage to identify the presence of wildlife and wildlife habitat (including SAR/SOMC) and wildlife habitat (including aquatic, semi-aquatic, riparian and terrestrial habitats) within the PDA and any adjacent impacted lands, as well as to develop a more complete understanding of the likelihood of breeding, migration, and overwintering use use by SAR (including bats), migratory birds, reptiles, amphibians and invertebrates and the annual variation in SAR occurrence and/or habitat use within the Project area. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p>



	Categories of issues	Integrated Project Team Responses
		<p>After field surveys are conducted and a list of terrestrial/semi-aquatic species and SAR/SOMC are identified, species-specific mitigation measures and permit requirements will be confirmed, and a management approach will be developed. The need for and extent of any follow-up program will be confirmed and developed through the design process. Detailed mitigation measures, the management approach and follow-up programs will form part of the EEP.</p> <p><b>Revised text for Table 15-9: Planned studies</b> Inventory of birds, including surveys for SAR, migratory birds and their habitat use, breeding birds, winter bird surveys, and studies to determine seasonal and annual variation in bird populations.</p> <p>Estimated timeline: Spring / Summer / Fall 2023 and Winter 2024</p>
	<b>Navigation and Navigable Waters</b>	
36	<p>Potential effects on navigation in the Ottawa River during deconstruction of the existing bridge and construction of the new bridge. Need for further information on proposed mitigation measures for these effects.</p>	<p><b>Section 16.6 Navigation and Waterway Activities</b> captures mitigation strategies to address anticipated navigation impacts to commercial and recreational users. Affected stakeholders will be kept up-to-date of any proposed impacts to navigation through a developed public communications strategy.</p> <p>As the Project proceeds in the design stages, the IPT will engage with Indigenous communities to determine potential impacts to Indigenous traditional travel routes and their use of the river. Information will be sought from each Indigenous community to understand the potential impacts and seek acceptable mitigation strategies.</p>



	Categories of issues	Integrated Project Team Responses
	<b>Need for the Project</b>	
37	Request for an updated analysis on the need for the Project, considering changes in traffic, work settings, and social behaviour in the wake of the COVID-19 pandemic.	<p>The Alexandra Bridge is a key piece of regional transportation infrastructure and is integral to mobility planning in both cities and the region. The Bridge forms an inherent part of Confederation Boulevard, the Capital’s ceremonial and discovery route, which connects many sites and symbols of national significance and forms a loop that connects both sides of the Ottawa River, linking Ontario and Quebec.</p> <p>The current bridge is in an advanced state of deterioration and has several significant structural concerns. The current condition of the bridge has resulted in a reduced level of service and has required the implementation of several mitigation measures by PSPC. At this time, the mitigation measures and reduced level of service are precautions considered appropriate for the Alexandra Bridge to remain safe and in service until its replacement.</p> <p>The Alexandra Bridge is one of only five interprovincial bridges open to vehicular traffic in the NCR linking the cities of Ottawa, Ontario and Gatineau, Quebec. The bridge carries about 13,300 vehicles per day, which amounts to approximately 9% of the average daily interprovincial vehicular traffic in the NCR (IBI Group, 2020). The bridge is also used by about 33% of all pedestrians and cyclists crossing the Ottawa River (City of Ottawa, 2013), making it a key piece of active transportation infrastructure in the region.</p> <p>Removal of the crossing without replacement would have significant social and economic impacts. It is an option that was considered unacceptable. Notwithstanding potential changes in traffic, work setting and social behaviour due to the COVID-19 pandemic, the Alexandra Bridge will continue to be an essential part of the transportation infrastructure of the NCR. In addition, Alexandra Bridge is a unique place that offers an important vantage point affording significant views, drawing visitors and residents to experience the panoramic views of the Parliament Buildings, as well as national cultural symbols such as the Rideau Canal locks, Kiwekì Point (formerly named Nepean Point), Major’s Hill Park, Lady Grey Drive, Jacques-Cartier Park and the Ottawa River. The new bridge will maintain this vital link between the capital core areas of the two provinces, providing a convenient connection between two major cultural institutions, the Canadian Museum of History and the National Gallery of Canada.</p>

	Categories of issues	Integrated Project Team Responses
<b>Project Activities and Design</b>		
38	Need for further information on the specific locations of project activities (including scale drawings and photographs where applicable) and their proximity to known habitat for fish, birds, and other wildlife.	Support areas for the construction phase of the Project will be required on both the Ottawa side and the Gatineau side of the river. Exact locations for equipment staging will be defined as the Project progresses. Vegetation surveys, migratory bird studies, terrestrial wildlife surveys, and fish and fish habitat assessment will take place in 2023 and will inform the design and location of these support areas. These studies will also identify mitigation and reinstatement measures required for the installation and follow up for construction work areas.
39	Need for further information on the proposed public transit lane on the new bridge, including how it might enable future implementation of a tram/streetcar system that would link Gatineau and Ottawa.	The functional requirements provide that the new structure must be designed to be adapted in the future for public transit via a tramway or light rail system. Further details will become available during the design stages of the Project.
40	Need for further information, if applicable, on plans to treat or dispose potentially contaminated soil, sediment, or wood chips.	<p>See <b>Section 22.3</b> for additional information on anticipated content of Material Management Plans.</p> <p>Excess soil that complies with federal guidelines may be reused on-site subject to geotechnical suitability. Soil that exceeds federal guidelines cannot be reused elsewhere on-site and will be disposed of at a facility licensed to receive such soil.</p> <p>Soil requiring disposal off-site will be managed in accordance with its destination. In Ontario, waste soil is managed in accordance with Ontario Regulation 406/19, <i>On-Site and Excess Soil Management</i> and Ontario Regulation 347, <i>General-Waste Management</i> under the <i>Environmental Protection Act</i>. These regulations lay out the requirements for transportation and disposal of impacted soil and sediment. They also outline the licensing requirements for haulers and receivers of waste.</p> <p>In Quebec, waste soil is managed in accordance with the <i>Guide d'application du Règlement sur l'enfouissement et l'incinération de matières résiduelles</i>, and the <i>Guide - Grille de gestion des sols excavés</i> under the <i>Règlement sur l'enfouissement des sols contaminés</i>. These documents and regulations outline the requirements for transportation and disposal of soils, depending on their level of impact.</p>

	Categories of issues	Integrated Project Team Responses
		<p>All sediment requiring removal will be transported off-site in the same manner and under the same rules and regulations as impacted soil.</p> <p>Wood chips will be disposed of in accordance with Provincial regulations.</p> <p>Other special requirements for handling and disposal of hazardous soils, sediment and wood chips are not anticipated as leachate testing did not identify any of the wastes as hazardous materials.</p>
41	Clarity on whether the areas in and around the Project would require cut and fill works in relation to the Project.	Cut and fill works may be required but will be defined by the design work at later stages of the Project. Soil generated by such works (including potentially contaminated soil) will be addressed in accordance with relevant federal and provincial regulations. <b>Section 11.5</b> provides a preliminary assessment of the potential footprint of the Project within the riverbed and shoreline below the 2-year flood level.
42	Provide information on any plans to include features such as shade and shelter, and rest areas for active transportation users in the design of the new bridge.	<p>As per the Planning and Design Principles, bridge design features must ensure inclusive, safe, equitable and universally accessible public space(s), exemplified through attention to lighting, interfaces that include pathways or railings, viewing areas, visual sightlines, furnishings, structural features and impacts of inclement weather, amongst others. Design features to provide appropriate wind and sun shelter at rest areas will be considered during design stages of the Project.</p> <p>In addition, lookouts, rest areas, and programmable areas outside the travel lanes should be flexible and safe to allow for gatherings and circulation of various sized groups, including the infrequent large public gatherings that may occur on the bridge.</p>
43	Provide information on any plans to use eco-friendly materials and products for the construction of the new bridge.	<p>As per the Planning and Design Principles, priority will be given to products with reduced environmental footprint from recycled or local sources. Products will be highly durable, recyclable and consider life cycle assessments and cost on a perspective of 100 years or more. The choice of materials and construction methods must consider their impacts on long-term maintenance and repair requirements.</p> <p>Also, demolition materials from the existing bridge may be repurposed or reused for reinstatement efforts on affected adjacent lands in the form of walls, staircases, benches, interpretive elements or to create a memory wall to reduce the carbon footprint of the</p>

	Categories of issues	Integrated Project Team Responses
		Project. The IPT will work in collaboration with other levels of government and regional partners, to explore all opportunities and synergies to reuse construction materials that are appropriate for other uses.
<b>Public and Stakeholder Engagement</b>		
44	Request information on proposed approach for increased and ongoing public engagement by the Proponent throughout the lifetime of the Project.	<p><b>Table 4-15: Overview of objectives and timelines for public engagement</b></p> <p>Alignment to planning/design/construction and demobilization stages of building process was added to <b>Table 4-15</b>. The IPT is dedicated to ensuring transparent, timely and ongoing communication and engagement with the public, throughout the life cycle of the Project.</p> <p>The IPT aims to make use of the NCC’s Project website, social media platforms as well as the Project newsletter list, among others, to share general information about the Project, including Project updates and progress, as well as detours and closures details. The IPT also aims to use the NCC’s public engagement platform to gather public input which will be used to inform all the phases of the Project.</p>
45	Requests for an Independent Design Review Panel for the Project that considers the historical, geographical, and heritage value of the Alexandra Bridge.	<p>Given the importance of the Alexandra Bridge’s iconic historic assets and impact of design and retention, PSPC is requesting that the Royal Architecture Institute of Canada (RAIC) establish a peer review panel, which will be engaged to provide independent advice to enable an appropriate response to the requirements for the preservation of heritage elements in the new build. The heritage elements are not limited to physical elements, but can also include people (the original designer/builder or prominent figures), place (the actual design) or story (how it contributed to Canada or local economy, or culture).</p> <p>Under the NCC’s FLUDTA process, future bridge designs will be presented at key stages to the NCC’s Advisory Committee on Planning, Design and Realty whose experts may advise on issues such as heritage, urban design and bridge expression.</p>
46	Request to form a Technical Advisory Committee to seek feedback from local municipal departments, including feedback on accessibility.	<p>An established working group composed of representatives from different levels of government and regional partners (e.g. the cities of Ottawa and Gatineau, Ontario and Quebec transportation ministries and public transit authorities) provides opportunities to share upcoming construction Project to ensure that the travelling public is not adversely affected.</p> <p>As the Project moves into the Concept Design stage, opportunities to broaden the</p>



	Categories of issues	Integrated Project Team Responses
		<p>membership in this working group, or the creation of new advisory groups will be explored with regional partners.</p> <p>In addition, as part of the NCC’s design review and approval process, future bridge design will be presented at key stages to the NCC’s Advisory Committee on Universal Accessibility for review and comment. When the design is ready and successfully addresses the committee’s comments, it will be presented to the NCC Board of Directors for approval at a public meeting. The mayors of Ottawa and Gatineau attend the public meetings of the NCC Board of Directors.</p>
<b>Social and Economic Conditions</b>		
47	Need for additional information on the number and types of jobs that would be created throughout all the phases of the Project.	Detailed information on the number and types of jobs created by the Project is not available at this stage of the Project. Additional information developed in the initial stages of the design of the new bridge is required to identify details of the workforce and specific trades required. Skill sets may vary depending on the approaches planned for construction of the new bridge and deconstruction of the existing bridge.
48	Potential effects on the local economy (local businesses, tourism attractions, fisheries, commuters travelling to work, commercial vehicle operators).	<p>PSPC engaged Deloitte and PwC to conduct socio-economic studies to understand the impacts of the Project on the local economy, communities, tourism and businesses, and try to mitigate those impacts.</p> <p>The deconstruction and construction phases are estimated to result in a continuous bridge closure from June 2028 until May 2032, for a total of 46 months. During this period, it is expected that the local Ottawa-Gatineau economy will be subjected to both negative and positive impacts.</p> <p>During the deconstruction and construction periods, the Project is expected to stimulate the local economy through the creation of 2,991 FTE opportunities directly related to the Project, generating \$273.7 million of GDP, of which \$223.2 million is labour income. It is also expected that the Project will directly stimulate the growth of the infrastructure/construction industry both locally and nationally. Additionally, it is estimated that 3,599 FTE opportunities will be induced and created indirectly by the Project, generating approximately \$444.2 million in GDP, of which \$247.3 million is labour income.</p>



	Categories of issues	Integrated Project Team Responses
		<p>Some of the main industries that are expected to benefit from the Project are:</p> <ul style="list-style-type: none"> <li>• Food services and hospitality</li> <li>• Architectural and engineering services</li> <li>• Employment services</li> <li>• Building material and supply merchants</li> <li>• Manufacturing, and truck transportation</li> </ul> <p>While some aspect of the local economy will be positively impacted by the Project, analysis also indicates some negative impacts. In fact, it is estimated that the impact to transport users during this time period is approximately -\$308.3 million, valued at \$18.79/hour (2021\$). These economic impacts are considered the results of inconveniences such as delays, detours and increased vehicle operating costs.</p> <p>In an effort to mitigate and minimize the above noted economic impacts of traffic volumes and travel times, the IPT is committed to:</p> <ul style="list-style-type: none"> <li>• Collaborating with other levels of government and regional partners (e.g. city of Ottawa/Gatineau and transport authorities) to develop traffic management and communication plans, including mitigating heavy truck traffic in anticipation of impacts related to traffic volumes.</li> <li>• Avoiding closure of multiple bridges as part of this Project. Should closure need to occur, adequate and sufficient detours will be put in place to minimize disturbance to the general public.</li> <li>• Developing a communication plan, in collaboration with stakeholders, that will serve to inform the public and tourists of any changes to hours of operation, services, and detours which will help maintain foot traffic.</li> </ul> <p>The socio-economic studies also estimate there is a risk of revenue loss for local businesses equating to \$98.8 million during the bridge closure period. However, this analysis captures only the gross impact, i.e. the reduction in spending by patrons who decide to no longer travel between Ottawa-Gatineau during the bridge closure. Accordingly, this analysis does not capture any potential corresponding increase in spending by these same patrons, who may decide to increase spending at businesses nearer to their homes or via e-commerce.</p>



	Categories of issues	Integrated Project Team Responses
		<p>These outcomes were not taken into account during the analysis due to data limitations.</p> <p>Estimates also indicate, the loss of local business revenue resulting from the closure of the Alexandra Bridge could place \$57.3 million of GDP from the local economy at risk, of which \$43.0 million is considered labour income. Furthermore, it is estimated that this loss in local business revenues could place an annual average of 50 jobs at risk during this time period.</p> <p>To minimize the impact to local businesses, the IPT is dedicated to:</p> <ul style="list-style-type: none"> <li>• Continue to engage with the public, in a timely manner, to ensure concerns are addressed in efforts to minimize the disruptions to businesses and the Project schedule</li> <li>• The IPT is dedicated to fostering a no surprise environment to affected businesses</li> <li>• If access to loading docks is needs to be constrained, timely communication and a strategy to ensure minimal disruption to operations will be put in place.</li> <li>• Developing wayfinding plans to help maintain traffic to those businesses.</li> </ul>
49	Request for information regarding hiring and human resource strategies in relation to the Project.	<p>The IPT works closely with its human resource professionals to ensure that hiring and human resource strategies comply with the <i>Employment Equity Act</i> (EEA). PSPC’s human resources professionals have developed an internal Diversity and Inclusion Action Plan 2021 to 2025 (DIAP), which includes a set of initiatives and activities to be implemented (mostly by PSPC’s Human Resources Branch) in coming years and are intended to enhance diversity, inclusion and well being at PSPC. Some examples:</p> <ul style="list-style-type: none"> <li>• Implementing diverse talent recruitment strategies and guides to bolster inclusive hiring</li> <li>• a manager’s diversity tool kit containing specific recruitment strategies to attract members of equity-seeking groups</li> <li>• establishing national “partially qualified” collective staffing pools for equity-seeking groups</li> <li>• maintaining and leveraging a national pool of diverse selection board members who have taken bias-free selection/staffing training</li> </ul> <p>Hiring and human resource strategies as part of the Project will continue to focus on</p>

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	<p>improving both the representation and experiences of employees in equity-seeking groups including those who identify as Indigenous, persons with disabilities, visible minorities and members of the LGBTQ2+. The IPT will continue to work closely with its human resource professionals to see how it can apply initiatives and ideas such as those included in the DIAP (most are in development at this time) in its hiring and human resource strategies.</p> <p>In terms of hiring and human resource strategies for the NCC, it should be noted that the Labour Program administers and enforces the Legislated Employment Equity Program (LEEP) under the <i>Employment Equity Act</i>, applies to the NCC, as a Crown corporation with over 100 employees. The NCC uses the tools and guidance provided through the program in their efforts to implement employment equity.</p> <p>In terms of the diversity of the workforce of consultants retained to deliver services for the Project, the Federal Contractors Program may apply to some contracts. This program helps promote the importance of employment equity by requiring that organizations that do business with the Government of Canada implement employment equity in their workplace, including ensuring their workforce is representative of Canada's labour force with respect to the 4 designated groups under the Employment Equity Act (women, Indigenous peoples, persons with disabilities, members of visible minorities).</p> <p>In addition, as part of its Supplier Diversity Action Plan, PSPC has been using pilot projects to test how to best provide procurement opportunities for underrepresented groups. Through these pilots, PSPC is learning about some of the barriers faced by underrepresented groups, as well as the support they may require when competing for federal contracts. As part of those efforts, PSPC launched a request for information to obtain information on procurement experiences from members of the LGBTQ2+ community. PSPC is building on the lessons learned from the pilots and is implementing a Policy on Social Procurement. The IPT will continue to work closely with PSPC's contracting professionals in an effort to comply with the various new or updated innovative procurement strategies, where applicable.</p>

	Categories of issues	Integrated Project Team Responses
50	Effects to active transportation users (pedestrians, cyclists, etc.) during deconstruction of the existing bridge and construction of the new bridge. Request for further information on proposed mitigation measures for these effects.	<p>The IPT is working to assess alternative routes to ensure access between both cities (Ottawa and Gatineau). Connections to tourist nodes for active transportation will also be considered. Mitigation measures will be further explored during the planning phase of the Project.</p> <p>At a minimum, the IPT expects that a traffic management plan will consider signage, detours, and potential alternatives for active transportation users.</p>
<b>Species at Risk, Wildlife, and their Habitat</b>		
51	Request for a complete list of species at risk that may occur in or around the project area.	The information requested is not available at this stage of the Project. A complete list of species at risk (SAR) and species of management concern (SOMC) that may occur in or around the Project area will be prepared following the completion of the various studies mentioned in Table 15-9: Planned studies.
52	Potential effects on species at risk, such as bats and their roosting habitat, turtles (such as Eastern Musk Turtle), snake species at risk, Butternut and American Ginseng, due to the deconstruction of the existing bridge and construction of the new bridge. Need for further information on proposed mitigation measures for these effects.	<p>Detailed information on the potential effects of the Project on vegetation and wildlife, including species at risk, and on the proposed mitigation measures is not available at this stage of the Project. As described in <b>Section 15.2 and Table 15-9: Planned studies</b>, vegetation and wildlife surveys, including for SAR, will be undertaken within the Project area to confirm the presence of SAR and provide baseline information required to fully assess the potential impacts of the Project. Survey timing windows will be modified to include the migration and overwintering seasons. The results of these surveys will potentially influence the bridge design and methods of construction, which will be developed in the design stages of the Project. This information is in turn required to determine the detailed potential effects of the Project on migratory birds, as well as to develop a management approach to protect this VC and ensure compliance with the <i>Species at Risk Act</i> and other federal and provincial legislation.</p> <p><b>VEGETATION</b>  <b>Revised text for Section 15.2.1.1 Vegetation</b>  The most likely SAR plant species that may be found in the vegetated areas of the PDA are Butternut and Rock Elm (<i>Ulmus thomasii</i>). In addition, ECCC notes the potential for American Ginseng (<i>Panax quinquefolius</i>) within the Project Area (ref. ECCC IPD Review).</p>



Categories of issues	Integrated Project Team Responses
	<p><b>Revised text for Section 15.2.1.1 Plant Species at Risk</b></p> <p>Potential impacts on vegetation (including SAR/SOMC) and ecological communities resulting from the deconstruction of the existing bridge and construction of the new bridge include changes to community diversity (including community loss), changes to species diversity, and introduction or spread of invasive species through vehicle and equipment movement. These potential impacts would be localized in nature. Given that there are no wetlands in proximity to the PDA, no impacts on wetlands are anticipated as a result of the Project.</p> <p>Activities related to construction, including vegetation clearing, stockpiling of materials, laydown areas, and excavation, may result in the removal and degradation of vegetation along the shoreline of the Ottawa River. While direct (i.e., due to removal or accidental damage) and incidental (i.e., due to compaction, erosion, spills or changes in the microclimate as a result of alterations to the tree canopy) disturbance of existing vegetation communities in the vicinity of the bridge abutments and staging/stockpiling areas are possible during construction, incidental disturbance to vegetation during operation are not anticipated. Given that this Project is a replacement of an existing structure, fragmentation of vegetation communities is not anticipated to be any greater than under existing conditions.</p> <p>Due to the urban nature of the Project area, potential impacts to SAR plants are expected to be limited to harming individuals of a listed species. While impacts at a local population level are possible, they are not anticipated to negatively affect any given species' chances of survival or recovery.</p> <p>Construction activities that may encroach on species at risk plants, such as Butternut, Rock Elm and American ginseng, will require site specific review prior to construction to confirm presence / absence-of these species.</p> <p>In addition, construction activities and machinery may also introduce invasive species to the Project area during construction (i.e., seed transfer) or contribute to the spread of invasive plants and/or diseases (i.e., Butternut canker, fungal pathogens of American</p>



Categories of issues	Integrated Project Team Responses
	<p>Ginseng) already located within the PDA.</p> <p>A more detailed assessment of the potential impacts of the Project on vegetation, including SAR and SAR habitat, will be completed based on the findings of future vegetation inventories and following the development of the initial design stages and construction methods.</p> <p><b>Revised text for Section 15.2.1.3 Mitigation and Protective Measures</b></p> <p>Field surveys will be conducted prior to the initial stages of design to identify the vegetation (including SAR/SOMC) and ecological communities within the PDA and any adjacent impacted lands. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required. After field surveys are conducted and a list of terrestrial vegetation and SAR is identified, species-specific mitigation measures and permit requirements will be confirmed, and a management approach will be developed. Detailed mitigation measures, the management approach and the need for and extent of any follow-up program will be confirmed and developed through the design process in discussion with permitting authorities.</p> <p>Mitigation efforts will prioritize avoidance and protection of any SAR plants observed during the surveys. If it is determined that SAR plants are present and will be impacted, appropriate SAR permits will be obtained, and mitigation/compensation plans will be developed for the specific species to minimize or compensate for the adverse effects. In addition to replacement plantings, compensation measures could include exploring opportunities to transplant individual SAR from within the footprint of construction (where feasible), collecting and propagating seeds for future species restoration projects, and archiving of genetic material. If Butternut are likely to be affected by Project activities, a</p>



	Categories of issues	Integrated Project Team Responses
		<p>Butternut health assessment may be required. Any works involving SAR plants that are susceptible to certain diseases may require special mitigation measures related to preventing the spread of these diseases (i.e., Butternut canker).</p> <p><b>WILDLIFE</b>  <b>Revised text for Section 15.2.2 Wildlife and Wildlife Habitat</b></p> <p>The PDA and LAA contain suitable habitat for SAR turtles and snakes. The Quebec Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks (MEFCCWP)<sup>1</sup> has identified this reach of the Ottawa River as potential habitat for the Spiny Softshell due to historical occurrences, with potential habitat for the Northern Map Turtle found approximately 1 km downstream and 2 km upstream of the Alexandra Bridge. Critical habitat for the Blanding’s Turtle (<i>Emydoidea blandingii</i>) has been identified by ECCC approximately 1.5 km to the south of the PDA. In addition, ECCC notes the potential for Eastern Musk Turtles (<i>Sternotherus odoratus</i>) to occur within the Project Area (ref. ECCC IPD Review). SAR and SOMC turtles, such as the Northern Map Turtle, Spiny Softshell (<i>Apalone spinifera</i>), Snapping Turtle and Midland Painted Turtle (<i>Chrysemys picta marginata</i>) may be encountered basking along the shoreline, on exposed rocks or trees, and/or at the base of the bridge. The Ottawa River may also be used as foraging and overwintering habitat and/or as a movement corridor.</p> <p>Turtles may be encountered as they migrate across upland habitats to search for breeding ponds and are at increased risk of mortality from vehicles and predators as they travel overland to nesting habitats (MNRF 2013).</p> <p>SAR snakes such as Eastern Milksnake (<i>Lampropeltis triangulum</i>) and Northern Watersnake (<i>Nerodia sipedon sipedon</i>) may be encountered basking along the shoreline, on exposed</p>

<sup>1</sup> Following a reorganization within the government of Quebec in 2022, provincial wildlife management, including species at risk, is now under the responsibility of the Ministry of Environment, the Fight Against Climate Change, Wildlife and Parks (MEFCCWP).





Categories of issues	Integrated Project Team Responses
	<p>rocks or trees, and/or at the base of the bridge. The Project area may also be used as foraging habitat with Eastern Milksnake hunting for small rodents and amphibians along the forest edge and Northern Watersnake hunting for fish and amphibians in the river (Ontario Nature ,2019).</p> <p>The Ottawa River also provides habitat for many species of amphibians. Most amphibians use the river and its riparian areas during certain phases of their lifecycle, whereas some, such as the Common Mudpuppy (<i>Necturus maculosus</i>), are strictly aquatic and rely on the river year-round (ORHDC, 2005). Species such as the Spring Peeper (<i>Pseudacris crucifer</i>), American Bullfrog (<i>Lithobates catesbeianus</i>), Green Frog (<i>Lithobates clamitans</i>), Northern Leopard Frog (<i>Lithobates pipiens</i>), Gray Treefrog (<i>Dryophytes versicolor</i>), American Toad (<i>Anaxyrus americanus</i>), Eastern Red-backed Salamander (<i>Plethodon cinereus</i>) and Blue-spotted Salamander (<i>Ambystoma laterale</i>) are found within the river’s watershed (iNaturalist, 2022; ORHDC, 2005). The Western Chorus Frog (<i>Pseudacris triseriata</i>), a species designated as threatened federally and vulnerable in Quebec (in the process of being designaged as threatened), has been observed in a small number of vernal pools in the lac Leamy sector and the Pickerel Frog (<i>Lithobates palustris</i>), a species likely to be designated as threatened or vulnerable in Quebec, has been observed in swamps and forests along the river approximately 4km upstream from the Chaudière Dam (NCC, 2022)</p> <p>With respect to terrestrial invertebrates, Monarchs may be encountered in open areas and along roadways where milkweed (<i>Asclepias</i> sp.) is found. In addition, ECCC notes the potential for Yellow-banded Bumble Bees (<i>Bombus terricola</i>) to occur within the Project area (ref. ECCC IPD Review). This species may be encountered foraging on a variety of flowers, or nesting or overwintering in underground cavities and rotten logs (COSEWIC, 2015).</p> <p><b>Revised text for Section 15.2.2.3 Potential Impacts</b></p> <p>Several of the deconstruction and construction activities (habitat destruction or alteration, disturbance from noise, dust, presence of machinery, etc.) have the potential to cause adverse effects on terrestrial wildlife, including SAR/SOMC, and wildlife habitat that may be</p>



	Categories of issues	Integrated Project Team Responses
		<p>present in the Project area.</p> <p>Bird SAR and migratory birds are vulnerable to disturbances during the breeding season (between April 8 and August 28 for the PDA, although nesting also infrequently occurs outside of this period (ECCC 2018a). Bridge deconstruction and construction may disrupt nesting opportunities for some migratory birds and bird species at risk either through removal of existing nests or disturbance of nesting habitat. Direct disturbances include vegetation removal (i.e., tree clearing) and construction activities (i.e., deconstruction of the bridge), which may result in the destruction of nests and/or eggs. Incidental disturbances include sensory disturbances associated with construction activities (i.e., noise, vibrations, and light) which may lead to nest abandonment. Disturbance impacts may be temporary (i.e., noise, vibrations and lighting during deconstruction and construction) or permanent (i.e., due to vegetation removal, bridge lighting and/or if the design of the replacement structure does not provide nesting habitat). Birds (including SAR) nesting on the bridge structure, such as Barn Swallow and Eastern Phoebe, and in nearby vegetation may be impacted.</p> <p>The same is true for any SAR bats that may be using the existing bridge or nearby vegetation for roosting (from April 1 up to September 30 to be confirmed with federal and provincial agencies), with deconstruction and tree removal disrupting or removing suitable habitat (either temporarily or permanently, depending on the future bridge design) and sensory disturbances leading to the abandonment of maternity/roosting sites or hibernacula.</p> <p>Activities during deconstruction and construction have the potential to result in direct and incidental effects on turtles as a result of construction noise and disturbance (i.e., increased turbidity in the water, changes to water flow and sediment transport regimes, increased human activity causing turtles to abandon the area, alteration to nesting or basking sites), or direct mortality through contact with construction equipment and/or the loss of habitat. Excavation activities also have the potential to result in the destruction of nests and/or overwintering habitat. Turtle nesting typically takes place between mid-May and late July, with eggs remaining in the nest until September or October (or in some cases, overwinter).</p>



	Categories of issues	Integrated Project Team Responses
		<p>Construction activity can result in direct mortality to snakes, which are vulnerable during emergence from a hibernaculum, re-entrance, and basking periods, and may seek out construction materials to bask under. The Project may also have direct or incidental impacts on nesting sites and hibernacula, either through destruction of habitat or disturbance leading to abandonment of the area, while changes to water flow and sediment transport regimes may impact the aquatic Northern Watersnake. Potential impacts will be further assessed and confirmed as Project design progresses.</p> <p>Potential direct and incidental impacts on amphibians may result from contact with construction equipment during the terrestrial and aquatic phases of their lifecycle, fragmentation, modification or loss of breeding, feeding and overwintering habitats and dispersal pathways, changes to water flow, and modification of riparian areas. Similarly, invertebrates may experience direct impacts from contact with equipment and incidental impacts from the modification or destruction of foraging, nesting and overwintering habitats.</p> <p>Wildlife potentially present adjacent to the active construction site are species that are already acclimatized to the disturbed urban environment and impacts to these species from increased noise and lighting are expected to be low. Due to the urban nature of the Project area, potential impacts to SAR wildlife are expected to be limited to harming individuals of a listed species. While impacts at a local population level are possible, they are not anticipated to negatively affect any given species' chances of survival or recovery.</p> <p>Limited vegetation clearing may be required to facilitate construction activities, which may also affect nests or habitat of migratory birds, potential SAR bat maternity roost tree habitat and habitat for common urban wildlife species.</p> <p>A more detailed assessment of the potential impacts of the Project on terrestrial wildlife, wildlife habitats and local population, including SAR and migratory birds, will be completed based on the findings of future wildlife surveys (see 15.2.2.3) and following the development of the initial design stages and construction methods.</p>



Categories of issues	Integrated Project Team Responses
	<p><b>Revised text for Section 15.2.2.4 Mitigation and Protective Measures</b></p> <p>Wildlife and wildlife habitat protection and mitigation measures will be included as a component of the EPP to identify specific wildlife protection measures to be implemented during construction. This plan will include a variety of measures to be implemented during design and construction of the Project, such as adherence to wildlife timing windows, species monitoring, and wildlife handling protocols.</p> <p>Field surveys will be conducted prior to the initial design stages to identify the presence of wildlife (including SAR/SOMC) and wildlife habitat (including aquatic, semi-aquatic, riparian and terrestrial habitats) within the PDA and any adjacent impacted lands, as well as to develop a more complete understanding of the likelihood of breeding, migration, and overwintering use by SAR (including bats), migratory birds, reptiles, amphibians and invertebrates, and the annual variation in SAR occurrence and/or habitat use within the Project area. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p> <p>After field surveys are conducted and a list of terrestrial/semi-aquatic species and SAR/SOMC are identified, species-specific mitigation measures and permit requirements will be confirmed, and a management approach will be developed. The need for and extent of any follow-up program will be confirmed and developed through the design process. Detailed mitigation measures, the management approach and follow-up programs will form part of the EEP.</p> <p>Where SAR turtle, snake and/or amphibian habitat is confirmed during site investigations, mitigation measures would be developed in consultation with ECCC, MECP and MEFCWP. Examples of standard mitigation to keep reptiles and amphibians out of construction areas include the installation of an exclusion fence designed in accordance with the <i>Best Practices</i></p>



	Categories of issues	Integrated Project Team Responses
		<p><i>Technical Note – Reptile and Amphibian Exclusion Fencing</i> (MNRF, 2013). In addition, a reptile and amphibian salvage and relocation plan will be developed to deal with any animals encountered within the construction area.</p> <p>With respect to turtles specifically, the exclusion fencing would need to be installed prior to the beginning of the nesting season (by end of April at the latest) and be maintained around the work area for the duration of the turtle active season (mid-April to end of October).</p> <p>If construction occurs during the spring, summer or fall (i.e., peak active season for herptiles: April 1 through October 31), potential snake cover (i.e., old boards, logs, construction debris) would be removed by hand and any snakes found underneath given the chance to leave without being harassed. Additionally, drivers and equipment operators should watch for basking snakes on the road.</p> <p>Where feasible to do so, the timing of deconstruction and construction activities will also be scheduled to avoid or minimize potential impacts on amphibians and their habitats during sensitive phases of their lifecycle (i.e., breeding, migration/dispersal, overwintering).</p> <p>If work is conducted during the Monarch breeding season (May to October), areas of high milkweed density will be avoided. Post-construction habitat restoration efforts will include considerations for pollinators, such as the restoration or creation of native foraging habitat for species such as the Monarch and the Yellow-banded Bumble Bee.</p> <p><b>Revised text for Table 15-9: Planned studies</b></p> <p>Vegetation: Butternut health assessments (as required)</p> <p>Estimated timeline: Following the detailed vegetation surveys (as required). Must be completed between May 15 and August 31 to be valid.</p> <p>Terrestrial wildlife:</p>



	Categories of issues	Integrated Project Team Responses
		<p>Studies to understand bat migration in the Project area and overwintering use by SAR wildlife.</p> <p>Estimated timeline: Spring / Fall / Winter 2023</p> <p>Studies to understand the annual variation in SAR occurrence and/or habitat use.</p> <p>Estimated timeline: Spring / Summer / Fall / Winter 2023-2024</p>
<b>Traffic and Transit</b>		
53	<p>Potential effects on traffic and traffic congestion during the deconstruction of the existing bridge and construction of the new bridge. Need for further information on proposed mitigation measures for these effects, such as a traffic management plan.</p>	<p>The IPT will continue to work in collaboration with regional partners (e. g. the cities of Ottawa and Gatineau, Ontario and Quebec transportation ministries and public transit authorities) to develop a traffic management plan for future works that may impact traffic volumes and travel times. Closure of multiple bridges will be avoided and adequate and/or sufficient detours will be put in place to minimize disturbance to the general public.</p> <p>Active modes and public transit will be encouraged to mitigate vehicular congestion on other bridges while the bridge is closed for construction.</p>
54	<p>Recommendation for the traffic management plan to consider wayfinding, reduction of vehicular traffic at peak times, impacts to individuals and communities along any formal or informal detour routes, sensitive areas, and measures to reduce greenhouse gas emissions.</p>	<p>The Alexandra Bridge provides a short direct link between the Cities of Ottawa and Gatineau. When the bridge closes during the deconstruction and construction phases, there will be a temporary loss of this link. To minimize the impact on users, the IPT is exploring various options, such as water taxi services (with universal accessibility) which could play an important role in providing crossing services to active transportation users. Understanding seasonal limitations will be essential to tailoring the appropriate mitigation.</p> <p>The IPT will work in collaboration with other levels of government and regional partners (e.g., the cities of Ottawa and Gatineau, Ontario and Quebec transportation ministries and public transit authorities) to put in place broader access to public transportation and to develop traffic management and communication plans, including mitigating heavy truck traffic in anticipation of impacts related to traffic volumes. Detours will seek to minimize disturbance to the public, as much as possible.</p> <p>The closure of multiple bridges will be avoided as part of this Project. Should closure be required, adequate and sufficient detours will be put in place to minimize disturbance to</p>

	Categories of issues	Integrated Project Team Responses
		<p>the general public. Detours and other changes to traffic patterns will be communicated to stakeholders and the public to ensure that people know how to reach various locations near the construction site. Wayfinding to reach public facilities, as well as general safety of the public in the construction zone, will be important aspects of construction planning.</p> <p>Throughout the Project there will be ongoing engagement with stakeholders and the public to discuss different options.</p>
	<b>Vulnerable Population Groups (Gender Based Analysis (GBA) Plus)</b>	
55	<p>Need for further information on employment barriers for various under-represented groups (Indigenous peoples, women, newcomers to Canada and immigrants, visible minorities, persons with disabilities, LGBTQ2, etc.), and how these groups will be included in economic opportunities created by the Project.</p>	<p>With the knowledge that employment barriers are experienced by under-represented groups (Indigenous peoples, women, newcomers to Canada and immigrants, visible minorities, persons with disabilities, LGBTQ2, and others), the IPT continues with an engagement strategy created to demonstrate how groups can be included in economic opportunities created by the Project.</p> <p>Employment barriers could include difficulty in accessing communications and resources, or unreliable or non-existent access to technology. It may then become difficult to create early connections with available opportunities as they are presented. In addition, challenges may include the need for accommodation of meeting or presentation times, such as for childcare or outside of work hours (Women and Gender Equality (WAGE), 2019). To date, best efforts have been made to ensure multiple formats of communications are presented with the aim of gathering feedback from a diversity of stakeholder groups and individuals.</p> <p>As an example, employment for women in the science, technology, engineering, and mathematics (STEM) field has identified barriers such as inflexible work schedules, family obligations, lack of mentoring and employment interruptions due to parenthood (Frank, 2019). This example demonstrates the need to develop further understanding of the many ways in which various under-represented groups may be barred from economic opportunities in this field and in construction settings such as this Project. In Canada’s legal framework, gender equality forms part of human rights legislation, and is reflected in the Impact Assessment Act. In terms of employment, a critical set of standards forms the Canada Labour Code, which includes provisions for equal treatment and compensation, leave and breaks, and flexible work arrangements, among other rights for employees in the</p>

	Categories of issues	Integrated Project Team Responses
		<p>federally regulated private sector (GOC, 2022). The Project will abide by all applicable legislation, regulations and standards for employment equality.</p> <p>As the Project continues, communication with regards to how stakeholder groups' members would like to be engaged, how they can best be accommodated, and the preferred format for communications will become key in how information is shared about the Project. The expressed needs and priorities of potentially impacted groups will then be applied to future engagement and outreach approaches. For instance, the application of a GBA Plus and the approach with Indigenous communities form part of ongoing conversations around establishing priorities and methods that address the requirements of the community.</p>
56	Need for details on the measures that would be taken by the Proponent to manage and address gender-based violence in relation to the Project.	<p>Gender based violence stems from gender inequality. Through communicating and raising awareness of gender-based violence, the IPT and those adjacent to the Project works can build the foundation for understanding and preventing toxic behaviours and attitudes (Gladu, 2016).</p> <p>The Project team will require zero tolerance for harassment behaviour on the work site. For PSPC employees, mandatory training is employed, and there is the potential for sensitivity training regarding gender-based violence for the team and experts working on the Project.</p> <p>PSPC and NCC mandatory training courses:</p> <ul style="list-style-type: none"> <li>• Prevention of Harassment and Violence</li> <li>• Harassment and Prevention for Employees</li> </ul> <p>Contractor requirements could include demonstrating policy in place for harassment in the workplace, as well as support available to employees for the duration of the Project. The Interim Standard on Harassment and Violence Prevention in the Workplace also applies to all employees of PSPC and all persons granted access to workplaces controlled by the department.</p>





	Categories of issues	Integrated Project Team Responses
57	Need for additional details on how the Proponent will engage and consult with sub-populations of Indigenous communities.	The IPT will initiate dialogue with Indigenous communities to understand the cultural values and practices and co-develop approaches to minimize potential impacts during the deconstruction and construction of the new bridge. The IPT will work with Indigenous communities to ensure that sub-populations of Indigenous communities are consulted throughout the Project.
58	Need for further information on how the Proponent would apply a Gender-based Analysis Plus lens in identifying and mitigating potential effects on health, social, and economic conditions of underrepresented groups.	<p>The IPT is committed to ensuring that all stages of the Project are analyzed through a GBA Plus lens. The new design of the bridge will reflect the different histories that overlay the land, specifically that of Indigenous partners and minority groups, including members of the LGBTQ2+ communities.</p> <p>The Government of Canada has affirmed its commitment to GBA Plus through initiatives that demonstrate action towards inclusive policy, programs and research. Through continued and adaptable engagement with under-represented groups with a variety of communication formats, identifying potential effects on health, social, and economic conditions can continue at all stages (including operation) of the Project. Providing Project information on multiple platforms and with the use of many formats will sustain accessibility and opportunity for these impacts to be identified and mitigated (Section 4.4).</p> <p>As has begun with engagement approaches of the Project to date, qualitative and quantitative data collection provide valuable feedback on methods used to communicate with stakeholder groups, Indigenous communities and individuals with an interest in the Project. To ensure robust analyses of the data, a diverse team within the IPT will be involved in the GBA Plus approach to the Project. Individually, team members can continue to grow knowledge on potential effects through trainings such as PSPC's Indigenous Learning Series. With enhanced baseline education, a diverse and collaborative team, and the continued gathering of data and feedback, there will be a repertoire of information from which approaches to Project activities can then be adjusted.</p> <p>The GBA Plus method would be applied specifically through continual execution of the following steps. Evidence would be gathered, such as biophysical data or community feedback, to inform the understanding of potential impacts on social, economic, and health factors. This would allow for evidence-informed adjustments to Project approaches,</p>



	Categories of issues	Integrated Project Team Responses
		followed by an evaluation and monitoring of the effectiveness of these changes. The overall goal would be to continue this analysis and adjustment for there to be increased benefit for those potentially impacted or involved in the Project.
	<b>Waste Management</b>	
59	Request for further information regarding recycling of materials from the existing bridge to be reused for the construction of the new bridge.	<p>Pursuant to the PSPC Real Property Sustainability Handbook (2021) in response to the Federal Sustainable Development Strategy 2019-2022 and the Treasury Board’s Greening Government Strategy (2020):</p> <ul style="list-style-type: none"> <li>• For projects over \$1M, construction, renovation and demolition (CRD) waste audits and waste reduction workplans must be completed, with final waste material quantities tracked in a diversion report.</li> <li>• For projects over \$1M, divert 90% of CRD waste where industrial recycling and diversion opportunities are supported and reduce the Project’s waste intensity (tonnes/m2) by 5%, where feasible.</li> </ul> <p>PSPC will require estimated quantities (weight) for the Project specific materials, it is not sufficient to provide anticipated quantities of waste to be generated by material type (the sample waste audit is not sufficient).</p> <p>PSPC will require an overall anticipated diversion rate for the Project.</p> <p>At Project completion a final diversion report must be submitted that includes: all records of disposal (material type, quantities, end destination), as well as the final waste diversion rate achieved by the Project. Should the Project not achieve the minimum PSPC diversion requirement of 90% the report will need to include reasoning (challenges with recyclability of certain material types, lack of market availability etc.) for not meeting this target.</p>
	<b>Water</b>	
60	Need for further information on baseline groundwater and surface water quality and quantity (water current and flow).	<p>The Phase II ESA (WSP, 2021a) program found exceedances of guidelines for metals and inorganics and volatile organic compounds in groundwater. The location and nature of these impacts will be incorporated into the planning for waste disposal at the site.</p> <p>Surface water quality sampling and assessment will take place in summer/fall 2025. This sampling will act as a baseline for changes during and after the Project.</p>

	Categories of issues	Integrated Project Team Responses
		<p>The climate change vulnerability assessment may indicate the need for a hydrological assessment of the Project. If completed, the hydrological assessment will provide further detail about surface water current and flow.</p> <p>Additional information on mitigation measures to protect water quality are described in <b>Section 15.1.4.2 Mitigation and Protective Measures for drainage and surface water</b> as well as in <b>Section 22 Environmental Protection</b>.</p>
61	<p>Need for further information on potential effects to water quality of the Ottawa River from disturbance of potentially contaminated soil, sediment, or wood chips (on the riverbed) around the project area, and from management of potentially contaminated snow, stormwater, or groundwater. Need for further information on proposed mitigation measures for these effects, and measures to minimize potential downstream effects.</p>	<p>Excavation of soil will take place in accordance with the contractor’s Erosion and Sediment Control (ESC) Plan to limit potential risks to the Ottawa River. The ESC Plan will include a multi-barrier approach defining the location and design of control mechanisms such as silt fencing, rock check dams, straw bale filters, drain covers, filter fabric under catch basins frame and gates and mud mats, as required. Environmental monitoring will be implemented to confirm appropriate mitigation measures are in place, maintained and functioning during the construction stage. A qualified Environmental Inspector will be present during site set-up, in-water works, site restoration and during sensitive activities or immediately following major runoff events.</p> <p>Sediment and wood chips will be removed (if required) in accordance with procedures to be laid out as part of a submission for a potential future <i>Fisheries Act</i> authorization for the Project. These procedures will ensure that potential impacts to fish and fish habitat for all construction activities are thoroughly evaluated, and that impacts are reduced and mitigated.</p> <p>Additional information on mitigation measures to protect water quality are described in <b>Section 15.1.4.2 Mitigation and Protective Measures for drainage and surface water</b> as well as in <b>Section 22 Environmental Protection</b>.</p>

	Categories of issues	Integrated Project Team Responses
		<p>The IPT will make efforts to limit stockpiles of potentially impacted material during the Project. In cases where stockpiling is unavoidable, mitigation measures to be included in plans may include:</p> <ul style="list-style-type: none"> <li>• Polyethylene barriers to separate stockpiles from underlying soils and wind.</li> <li>• Appropriate silt and erosion control measures will be implemented on all stockpiles.</li> <li>• Regular inspection of stockpiles.</li> <li>• Wetting of stockpiles to minimize generation of dust.</li> <li>• Limiting stockpile height to minimize erosion potential.</li> </ul>
62	<p>Potential effects on water levels and flows in the Ottawa River due to the deconstruction of the existing bridge and construction of the new bridge.</p>	<p>Hydrological assessments are anticipated to be required in the design of the piers for the new bridge to understand the risks for the structure as well as impacts on navigation and sediment transport from potential changes in the water flow and velocity. This assessment will provide guidance in the selection and configuration of coffer dams, if needed in the construction stages, as well as approaches to reduce impacts and provide direction on mitigation needed to isolate the construction areas.</p> <p>The Project will be reviewed in detail by DFO and is expected to require a <i>Fisheries Act</i> authorization. This will ensure that potential impacts to fish and fish habitat for all construction activities are thoroughly evaluated, and that impacts are reduced and mitigated. If impacts cannot be adequately reduced or mitigated, the IPT will work with DFO and interested Indigenous communities to propose compensation and/or habitat offset measures, as required.</p> <p>Once the bridge design is advanced and construction activities and methods are determined, potential significant negative impacts on water temperature and flow levels in the vicinity of the bridge will be further evaluated, along with linkages to other potential impacts (disturbances to aquatic species, erosion of riverbank, etc.).</p>
63	<p>Need for further information on how water collected from dewatering activities and cofferdams would be managed (monitoring, treatment, and discharge).</p>	<p>The Project will be reviewed in detail by DFO and is expected to require a <i>Fisheries Act</i> authorization. This will ensure that potential impacts to fish and fish habitat for all construction activities are thoroughly evaluated, and that impacts are reduced and mitigated. If impacts cannot be adequately reduced or mitigated, the IPT will work with</p>

	Categories of issues	Integrated Project Team Responses
		<p>DFO and interested Indigenous communities to propose compensation and/or habitat offset measures, as required.</p> <p>DFO has developed best management practices for cofferdams and diversion channels, which will form part of the planning for the Project and for any submission to DFO under the <i>Fisheries Act</i>. Submissions for Fisheries Act authorizations require information about monitoring frequency and duration, as well as proposed mitigation measures (e.g., treatment and subsequent discharge).</p>
64	Need for details related to the flow models used to estimate migration of sediments downstream of the Project, including any seasonal variations in flow and deposition rates.	Specifics of any areas impacted by sediment downstream of the Project will be developed and reviewed by the IPT as part of the DFO Request for Review. Potential effects can be avoided, mitigated or regulated through the conditions provided in a <i>Fisheries Act</i> Authorization and/or a <i>Species at Risk Act</i> Permit.
	<b>Wetlands and Riparian Habitat</b>	
65	Potential effects on wetlands and riparian habitat that is near, or hydrologically connected to, the Project.	Given that there are no wetlands in proximity to the Project area, no impacts on wetlands are anticipated as a result of the Project. The Project will be reviewed in detail by DFO and is expected to require a <i>Fisheries Act</i> authorization. Submissions for such authorization require consideration of riparian habitat, and require that all construction activities are thoroughly evaluated, and that impacts are reduced and mitigated. If impacts cannot be adequately reduced or mitigated, the IPT will work with DFO and interested Indigenous communities to propose compensation and/or habitat offset measures, as required.

## 3.2 Summary of Commitments

### 3.2.1 Commitments to Indigenous Communities

The following table summarises the commitments described in the DPD based on analysis of responses to potential impacts identified and requests from indigenous communities.

**Table 3-2: Summary of Commitments to Indigenous Communities**

<b>Commitments to Indigenous Communities</b>
<b>3.1 – Summary of Issues</b>
<b>Introduction</b> <p>The Integrated Project Team (IPT) looks forward to engaging with interested Indigenous communities to gather Indigenous knowledge that will contribute to the assessment of potential biophysical impacts as well as identification of potential impact to the social, health and economic condition of Indigenous communities. Engagement of Indigenous communities is essential to collect and validate Indigenous Knowledge that will be integrated with scientific knowledge in identification of potential impacts, development of mitigation strategies, as well as crafting of enhancement measures, site restoration and compensation if required.</p> <p>The IPT will engage Indigenous communities throughout all stages of the planning, design, construction and operation of the Project including to:</p> <ul style="list-style-type: none"><li>• provide opportunities for Indigenous communities to contribute to the design of the replacement bridge as well as evaluation of alternative alignments</li><li>• seek opportunities to include Indigenous knowledge along with information collected from various studies in consideration of potential impacts, mitigation strategies, enhancement measures, site restoration and compensation if required</li><li>• support Indigenous communities in conducting their own studies to contribute to the assessment of potential impacts and development of strategies to avoid or mitigate the impacts.</li></ul> <p>Economic benefits from the Project will flow mainly from participation by Indigenous people and businesses in contracting and work opportunities stemming from every stage of the Project.</p>
<b>Issue #6 – increased consultation efforts in the consideration of alternatives assessment</b> <p>Indigenous communities will be engaged in discussions to contribute to the evaluation of Alternative Means to complete the Project. The IPT will provide opportunities for Indigenous communities to contribute to the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments.</p>

## Commitments to Indigenous Communities

### Issue #34 – how Algonquin culture will be incorporated into the design

The IPT will engage with Indigenous communities, particularly with the Algonquin Nation as the host Nation of the Ottawa-Gatineau Region, to discuss perspectives, values and cultural elements that could be integrated into the design of the new bridge.

### Issue #8 – include Indigenous Knowledge in the assessment of climate change

The IPT looks forward to working with Indigenous communities to develop an approach to collect Indigenous Knowledge to be integrated in the climate vulnerability and risk assessment. Then, together, determine how the knowledge will contribute to mitigating and planning for the impacts of climate change.

### Issue #9– cumulative effects on Indigenous peoples and their Aboriginal and/or treaty rights

Valued Components (VC) and their spatial boundaries will be reviewed and confirmed as the Project becomes better defined at the design stages. This will provide opportunities to identify VC of concern to Indigenous communities and to establish appropriate boundaries for the assessment of impacts from the Project.

The spatial boundaries for the cumulative assessment on VCs of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in their existing characteristics.

### Issue #24 – discuss economic benefits with potentially impacted Indigenous groups

The IPT will co-develop Indigenous participation plans with Indigenous communities and the private sector to identify opportunities for economic benefits and to work with the Indigenous communities and businesses to realize the benefits.

### Issue #30 – cultural and archaeological heritage resources near the project area

The IPT will engage with Indigenous communities to understand the cultural values and practices which could lead to the co-development of approaches to minimize potential impacts during the deconstruction and construction of the new bridge.

## 5 – SUMMARY OF ENGAGEMENT WITH INDIGENOUS COMMUNITIES

### 5.1 - Commitment to Reconciliation

Specific commitments to reconciliation linked to the Truth and Reconciliation Commission's (TRC) Calls to Actions and the National Inquiry into Missing and Murdered Indigenous Women (MMIW) and Girls' Calls for Justice include:

## Commitments to Indigenous Communities

- TRC # 43 and 44 – engagement activities will ensure respect of Indigenous rights;
- TRC #92 – requiring contractors to increase Indigenous economic participation; and
- MMIW 4.2 – education and training plans, and improved hiring, support and retention practices required in the Indigenous Benefits Plans will improve equity in economic opportunities. Barriers to economic participation of women will be identified and addressed.

### 5.4 - Financial Support for Indigenous Engagement

Indigenous engagement and consultation will be done specifically for the Project. At the same time, PSPC is engaging with the same Indigenous communities and organizations on the Crossings Program of work which include other bridge-related Projects in the NCR and further upstream of the Ottawa River that are within the traditional territories of the communities and organizations.

Funding is being made available to ensure that Indigenous communities and organizations have the capacity to participate throughout the Project. Budget funds have been allocated over a 5 year period and work plans will allow Indigenous communities to plan ahead and make commitments to staff that will ensure continuity of participation. Funding will flow through Indigenous Services Canada (ISC) through the Strategic Partnerships Initiative (SPI). The SPI process, which is used by several Government of Canada departments and agencies, allows PSPC to transfer funds to ISC, which uses its program authority to then execute contribution agreements with the Indigenous communities and organizations. The amount of funding to be made available to each community and organization will be determined through a collaborative planning process whereby the Indigenous parties will identify their funding requirements.

### 5.5 – Procedural Engagement – Indigenous Participation in Studies

The Project will require many studies to be undertaken. The IPT has committed to extensive Indigenous engagement in the studies, from their conception through execution and analysis. The nature of the participation will be determined by the Indigenous communities themselves, including:

- Reviewing the list of proposed Project studies and suggesting additional studies that may be useful and necessary
- Reviewing draft Terms of References for studies and commenting on the appropriateness and adequacy of the approach
- Indigenous communities leading studies with financial support from the IPT and providing the results to the IPT.
- Indigenous communities participating in studies in parallel with the work of external experts hired by the IPT, such as the various Guardians initiatives active in Indigenous communities. This will foster the two-way sharing of knowledge between scientists and Indigenous people.
- Reviewing the results of studies undertaken under the direction of the IPT and providing comments and guidance.



## Commitments to Indigenous Communities

### 15 – BIOPHYSICAL ENVIRONMENT AND POTENTIAL IMPACTS

The spatial boundaries for the cumulative assessment on VCs of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in the existing characteristics of the valued component.

#### 15.2 – Biological Setting - Mitigation and Protective Measures for vegetation, wildlife and wildlife habitat as well as fish and fish habitat

The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help shape proposed mitigation, enhancement measures and compensation measures if required.

#### 16.5 – Archaeological Potential

The IPT will work with interested Indigenous communities to provide opportunities for meaningful engagement and establish processes for Indigenous communities to have representatives present during archaeological resource recovery programs.

The following Indigenous communities have expressed initial interest in participating in or leading various studies:

##### Algonquins of Ontario (AOO)

- The IPT and the AOO have agreed on a multi-year work plan and budget that will support the completion of several studies of interest to the community.
- The community has requested that the Kichi-Sibi Guardians participate in the development and implementation of fish surveys, the review of reports and various environmental monitoring efforts.
- The community will conduct its own AOO Health and Socio-Economic Study and Algonquin Knowledge and Land Use Study (AKLUS).

##### Algonquins of Pikwakanagan First Nation (AOPFN)

- The community will conduct its own studies, including a cumulative effects assessment, and will determine at a later date how it will participate in studies led by the IPT.
- AOPFN will share valuable Indigenous Knowledge to help support the development of the Climate Risk and Vulnerability Assessment.
- The community has expressed a desire that AOPFN Knowledge Keepers participate in several biophysical studies, including:
  - The design of the bird field surveys
  - The creation of the list of species

## Commitments to Indigenous Communities

- The identification of the scale and scope of aquatic and semi-aquatic plant community surveys and contribution of Indigenous Knowledge to various aquatic surveys.

### **Kebaowek First Nation (KFN)**

- The First Nation has indicated that it will conduct its own studies, including a cumulative effects or regional assessment of the Ottawa River watershed.

### **Kitigan Zibi Anishinabeg First Nation (KZA)**

- The community is interested in all archaeological digs that may take place as a result of the Project.

### **La Nation Huronne-Wendat**

- The Nation has expressed an interest in participating in and/or leading various environmental and cultural impact studies.
- The Nation is particularly interested in reviewing the archaeological/heritage studies that have already been completed, including supplementing existing data and studies with their own as needed, as well as participating in the development of future studies.

### **Timiskaming First Nation**

- The community has requested involvement in reviewing the terms of reference and participating in Project studies. Species studies are of particular importance to the community.
- The community also requested that communities be invited to help return aquatic species to the river during de-watering activities, as well as the opportunity to harvest any deceased organisms for possible consumption or use in traditional crafts.

### **Wahgoshig First Nation**

- The community would like to create a workplan and budget to support their participation in the Project.

Additional studies may be added as the Project moves forward.

## Additional studies of potential interest to Indigenous communities

Physical and Cultural Heritage	Information could be gathered through ongoing engagement or studies.  Approach will vary for each community.  Further studies or independent studies will be discussed based on results of planned baseline data gathering.
Current Use of Lands and Resources for Traditional Uses	
Survey of traditional plants	
Health, social and economic conditions	
Changes to the Physical Environment	
Changes to Valued Components	

### 3.2.2 Summary of Project Commitments

The following table summarises the commitments described in the DPD based on initial analysis of potential impacts from the Project and planned mitigation strategies.

**Note:** Timelines provided for studies are anticipated and subject to change based on the Project schedule and needs identified during the planning and design process.

**Table 3-3: Summary of Commitments Project Commitments**

Project Commitments
3.1 – Summary of Issues
<p><b>Issue #58</b> – Gender-based Analysis Plus lens in identifying and mitigating potential effects on health, social, and economic conditions of underrepresented groups</p> <p>The IPT is committed to ensuring that all stages of the Project are analyzed through a GBA Plus lens. The new design of the bridge will reflect the different histories that overlay the land, specifically that of Indigenous communities and minority groups, including members of the LGBTQ2+ communities.</p>
4 – SUMMARY OF PUBLIC ENGAGEMENT
<p>Public engagement for the Project will include four (4) additional rounds of public consultation centered on design and construction milestones: the conceptual design, functional design, preliminary design, and, detailed design and construction plans. These future consultations will also provide opportunities for the public to weigh in on potential mitigation and enhancement measures as the new bridge’s design and the likely impacts of the Project, as a whole, become better defined.</p> <p>Communicate the following to the design team:</p> <ul style="list-style-type: none"> <li>• Make the planning and implementation of active mobility detours a priority</li> <li>• Minimize the period during which the crossing would be closed</li> <li>• Consider impacts to commercial traffic and public transportation on other bridges during construction</li> <li>• Look to international examples of design excellence for inspiration</li> </ul> <p>Continue to communicate with regional partners, including the City of Ottawa, the Ville de Gatineau, the Société de transport de l'Outaouais (STO), and OC Transpo to plan measures for traffic control.</p> <p>Communicate the following to the team undertaking a Heritage Impact Analysis (HIA):</p> <ul style="list-style-type: none"> <li>• Make preserving the memory and significant elements of the bridge a priority.</li> <li>• Communicate plans to commemorate the heritage with the public early in the process.</li> </ul>

## Project Commitments

### 6 – ENGAGEMENT WITH GOVERNMENT ENTITIES

Build Relationships/Engage the Province of Ontario and Quebec as the **Project** progresses to apprise them of conversations with other Ministries or stakeholders.

### 11 – PROJECT ACTIVITIES

#### 11.6 – Associated Infrastructure and Activities

Use of Jacques-Cartier Park for staging is subject to NCC approval and requirements as a landowner. Depending on methods selected, deconstruction and construction activities may require use of docking or mooring structures within the park area to load and unload materials. There is also a concurrent need to maintain safe public access to the river to support commercial tourism operations and recreation activities. Options for infrastructure required to support ongoing operations while anticipating construction needs and the future use of the park are being evaluated. Impacted stakeholders will be engaged in the development of appropriate mitigation options.

### 15 – BIOPHYSICAL ENVIRONMENT AND POTENTIAL IMPACTS

#### Introduction

Potential adverse environmental impacts of the Project, at this stage of the planning work, were evaluated through consideration of the interactions between the Project and the natural (physical and biological) environment. Mitigation measures that could avoid or reduce potential adverse environmental impacts are identified. A preliminary characterization of potential residual Project-related impacts is provided. Residual impacts will be further evaluated and confirmed at the design stage, as will cumulative effects where appropriate and recommended follow-up program measures.

Valued components and their spatial boundaries will be reviewed and confirmed as the Project becomes better defined at the design stage. This will provide opportunities to identify valued components of concern to interested Indigenous communities and to establish appropriate boundaries for the assessment of impacts from the Project.

#### 15.1 – Physical Setting

##### 15.1.1 – Atmospheric Environment

- An Air Quality Impact Assessment may be required to predict concentrations of pollutants emitted during all Project stages
- Best Management Practices will be implemented where applicable, such as reducing vehicle idling time, shutting down equipment when not in use, stabilizing disturbed areas through the use of water for dust control, and providing proper maintenance of equipment and vehicles operating in work areas.
- The need for and extent for air quality studies will be confirmed and developed as the Project progresses.

## Project Commitments

### STUDIES

**Air quality** (Deconstruction and Construction) – during design stages of the Project

**Meteorological Environment** (Temperature, Precipitation, Wind, Visibility) – Update information if required based on climate risk assessment, desktop review or monitoring station data and analysis (2025).

#### 15.1.2 – Acoustic Environment

An Acoustic Impact Assessment could be completed in 2025 if required. A communication plan will be established to address noise-related complaints from future development activities.

- Mitigation measures will be implemented (e.g., muffler systems, restrict construction activities to daytime hours (7 am to 9 pm)) to avoid / reduce the impacts of construction noise. Municipal noise by-laws will be followed as applicable during construction.
- An Acoustic Impact Assessment is anticipated to be needed as part of the Project planning to identify existing receptors, establish baseline (ambient) noise conditions, and predict construction noise lasting longer than 1 year, including the magnitude of such changes and an evaluation of the change in percent highly annoyed (%HA) at each sensitive receptor. Where potential exceedances are predicted, appropriate noise mitigation measures will be employed.
- During the deconstruction and construction stages, the Contractor will be required to comply with the bylaws for both cities of Gatineau and Ottawa and any other noise mitigation requirements.
- A communication plan and complaints resolution process will be developed prior to construction to provide potentially affected individuals with information to address noise-related and other complaint during all construction activities.
- If required, a follow-up and monitoring plan will be established to verify the accuracy of predictions and determine the effectiveness of proposed noise mitigation measures at representative sensitive receptors.

### STUDIES

**Acoustic Impact** (Deconstruction and Construction period) – during design stages of the Project

#### 15.1.3 – Physiography, Geology, and Hydrogeology

- Geochemical analysis may be required to assess the potential for acid generation and metal leaching from the disturbed rock mass as the design of the new structure progresses.
- To mitigate potential effects of seismic activity, the new bridge will be designed and constructed in accordance with the seismic requirements of the National Building Code of Canada (National Research Council of Canada, 2015) and the Canadian Highway Bridge Design Code (Canadian Standards Association, 2006), or those in effect during bridge design stages.
- Dewatering may be necessary to construct the bridge piers and abutments. Appropriate mitigation measures would be installed during isolation and dewatering activities to manage discharge water, including appropriate erosion and sediment controls and ensuring that discharge water is properly filtered.

## Project Commitments

- Existing conditions and predicted effects on water quality will be compared against the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the protection of freshwater aquatic life (CWQG-FAL) (CCME, 2012).

### STUDIES

**Geology, geochemistry and geological hazards** – completed as part of the design of the bridge, if needed

**Topographic Survey of the PDA** (including bathymetric survey of the Ottawa River) – during design stages of the Project, if needed

#### 15.1.4 – Drainage and Surface Water

The fluvial geomorphology, flow conveyance and water velocity of the river have the potential to be impacted by the removal of the existing bridge piers and design/installation of the new piers. The design of the bridge will consider potential impacts that may occur during a regional flood event, such that capacity is maintained to convey flows during a regional storm event without adversely affecting upstream flood elevations.

Hydrological assessments are anticipated to be required for the design of the piers for the new bridge to understand the risks for the structure as well as impacts on navigation and sediment transport from potential changes in the water flow and velocity. This assessment will provide guidance in the selection and configuration of coffer dams, if needed in the construction stages, as well as approaches to reduce impacts and provide direction on mitigation needed to isolate the construction areas. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and discuss appropriate mitigation strategies.

Once the bridge design is advanced and construction activities and methods are determined, potential significant negative impacts on water temperature and flow levels in the vicinity of the bridge will be further evaluated, along with linkages to other potential impacts (disturbances to aquatic species, erosion of riverbank, etc.).

During construction, another risk to surface water quality is the potential for a contaminant spill during a large storm event. To address this concern, the following mitigation measures are proposed:

- Refueling of equipment should be undertaken at a minimum distance of 50 m from the Ottawa River to reduce potential impacts to surface water in the event that an accidental spill occurs.
- If a 50 m refueling minimum distance is not possible, under approval from on-site environmental personnel, special refueling procedures for sensitive areas should be undertaken that include, at a minimum, using a two-person refueling system with one worker at each end of the hose.

## Project Commitments

### STUDIES

**Riparian and wetland environments** – Field work will be part of surface water studies.

**Hydrogeological assessment** – completed as part of the design of the bridge, if needed.

**Surface water quality sampling and assessment** – Summer/fall 2025

**Hydrology assessment**– completed as part of the design of the bridge.

### 15.2 – Biological Setting

#### 15.2.1 – Vegetation

Field surveys will be conducted prior to the initial stages of design to identify the vegetation (including SAR/SOMC) and ecological communities within the PDA and any adjacent impacted lands (LAA). Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.

- After field surveys are conducted and a list of terrestrial vegetation and SAR is identified, species-specific mitigation measures and permit requirements will be confirmed, and a management approach will be developed. Detailed mitigation measures, the management approach and the need for and extent of any follow-up program will be confirmed and developed through the design process.
- The limits of the construction footprint will be identified in the field, to allow for the protection of off-site natural areas and vegetation and to avoid incidental encroachment into adjacent areas.
- A detailed inventory of vegetation within the construction footprint and other impacted sites will be completed, and adequate compensation through replanting and/or financial contributions to various enhancement measures such as habitat restoration will be required, in accordance with the NCC Forest Strategy (NCC, 2021b). Any trees to be removed will be compensated at a minimum ratio of 2:1.
- Storage of construction materials or equipment should not occur within the critical root zone of any tree species in the PDA and LAA to avoid impacting potential habitat areas not directly affected by the Project footprint. Any emissions from machinery should be directed away from foliage and vegetation.
- A pre-construction survey of the development footprint of the Project and adjacent impacted lands will be undertaken to confirm the presence or absence of invasive plants. An invasive species management plan will be developed as part of the EPP to mitigate the spread of invasive species.

## Project Commitments

### STUDIES

#### ***Inventory for potential plant SAR/SOMC (or their suitable habitat) and invasives –***

Spring/Summer/Fall 2023. Additional work in 2024 as required

***Detailed vegetation surveys*** (including tree inventories, identification of ecological communities) –  
Once the adjacent impacted lands have been confirmed.

***Butternut health assessments*** (as required) - Must be completed between May 15 and August 31 to be valid.

#### **15.2.2 – Wildlife and Wildlife Habitat**

A more detailed assessment of the potential impacts of the Project on terrestrial wildlife, wildlife habitats and local population, including SAR and migratory birds, will be completed based on the findings of future wildlife surveys (see 15.2.2.3) and following the development of the initial design stages and construction methods.

Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.

- Wildlife and wildlife habitat protection and mitigation measures will be included as a component of the EPP to identify specific wildlife protection measures to be implemented during construction. This plan will include a variety of measures to be implemented during design and construction of the Project, such as adherence to wildlife timing windows, species monitoring, and wildlife handling protocols.
- Field surveys will be conducted prior to the initial design stages to identify the presence of wildlife (including SAR/SOMC) and wildlife habitat (including aquatic, semi-aquatic, riparian and terrestrial habitats) within the PDA and any adjacent impacted lands, as well as to develop a more complete understanding of the likelihood of breeding, migration, and overwintering use by SAR (including bats), migratory birds, reptiles, amphibians and invertebrates, and the annual variation in SAR occurrence and/or habitat use within the Project area.
- Detailed design of the construction area will be reviewed to avoid and minimize impacts on wildlife habitat and vegetated areas to the extent possible. Where possible, wildlife timing windows will be respected to avoid disturbance to wildlife during the breeding season. If work during critical timing windows is unavoidable, appropriate exclusion measures will be implemented. If necessary, alternative nesting/roosting structures may be constructed. Long-term impacts to wildlife will also be considered in the design of the new bridge.
- If migratory or SAR bird nests are identified in proximity to construction/rehabilitation activities within the work area, construction activities near the nest will cease until ECCC/MECP/MNRF/MEFCCWP can be contacted for advice. Nests will not be removed from the bridge without consulting an avian biologist and issuance of a SARA and/or *Migratory Birds*



## Project Commitments

*Convention Act, 1994 (MBCA) permit and/or relevant provincial permit, if required, from the ECCC/MECP/MNRF/MEFCCWP.*

- Construction activities with the potential to remove migratory bird habitat, such as bridge deconstruction and vegetation clearing, will be avoided to the extent possible during the breeding season. If under-bridge work is proposed during this period, exclusionary measures (e.g., netting, bioacoustic deterrence) will be installed prior to April 1 to deter nesting on the bridge following guidance outlined in Best Management Practices for Excluding Barn Swallows and Chimney Swifts from Buildings and Structures (MNRF, 2017a).
- If Barn Swallow nests are observed on the bridge, and deconstruction activities cannot be completed outside the breeding season, Barn Swallow nesting structures would be installed near the PDA prior to deconstruction of the existing bridge to compensate for the loss of nesting habitat under the bridge.
- Given that the Ottawa River is designated as a dark sky zone, any lighting for the replacement bridge will consider this designation, as well as the NCC Bird-Safe Design Principles (2021).
- To mitigate disturbance or potential harm to any roosting bats confirmed through the proposed bat surveys, any tree clearing and construction/deconstruction activities on the bridge would be completed outside the roosting timing window for bats (from April 1 up to September 30 to be confirmed with federal and provincial agencies). If avoidance is not possible during bridge deconstruction, the installation of 3/8" netting prior to the roosting season would be required to prevent bats from roosting on the bridge structure (Fraser, 2019). This exclusion netting would also serve to exclude migratory birds from the structure and would be regularly inspected and maintained in good repair.
- Where SAR turtle, snake and/or amphibian habitat is confirmed during site investigations, mitigation measures would be developed in consultation with ECCC, MECP and MEFCCWP. With respect to turtles specifically, the exclusion fencing would need to be installed prior to the beginning of the nesting season (by end of April at the latest) and be maintained around the work area for the duration of the turtle active season (mid-April to end of October).
- Where feasible to do so, the timing of deconstruction and construction activities will also be scheduled to avoid or minimize potential impacts on amphibians and their habitats during sensitive phases of their lifecycle (i.e., breeding, migration/dispersal, overwintering).
- If work is conducted during the Monarch breeding season (May to October), areas of high milkweed density will be avoided. Post-construction habitat restoration efforts will include considerations for pollinators, such as the restoration or creation of native foraging habitat for species such as the Monarch and the Yellow-banded Bumble Bee.
- Any follow-up and monitoring plans will be developed for VCs where residual adverse effects are predicted or uncertain. If required, a follow-up and monitoring plan would be implemented during relevant Project phases to verify the accuracy of predictions and determine the effectiveness of proposed wildlife and wildlife habitat mitigation measures at representative sensitive receptors.
- Compensation for removal of SAR habitat may be required (e.g., with the installation of Barn Swallow nesting structures, bat boxes, etc.) and will be determined in consultation with



## Project Commitments

ECCC/MECP/MEFCCWP. There are also opportunities to implement these wildlife habitat structures or other habitat restoration and enhancement measures to offset some of the past impacts of urban developments in this region.

### STUDIES

#### **Birds, migratory birds and their habitat**

**Inventory of birds**, including surveys for SAR/SOMC, migratory birds and their habitat use, breeding birds, winter bird surveys, and studies to determine seasonal and annual variation in bird populations. – Spring/Summer/Fall 2023 and Winter 2024

**Bird nest searches** prior to vegetation removal – within 48 hours of vegetation clearing if occurring during the breeding bird season

**Scans for migrant birds** using the area as a stop over – Spring and Fall 2023 (if required)

#### **Terrestrial wildlife and their habitat** (mammals and herpetofauna)

Inventory of potential animal SAR/SOMC (or their habitat) Spring/Summer/Fall 2023 + Winter 2024

**SAR bat colony/maternity roost surveys**, including a tree bat habitat maternity roost assessment and bat exit survey at the bridge – June/July 2023

Studies of the seasonal and annual variations in SAR occurrence and/or habitat use – Spring/Summer/Fall 2023 + Winter 2024

**Bat migration** in the Project area and overwintering use by SAR wildlife – Spring/Fall 2023 + Winter 2024

**Turtle emergence and basking** – May/June 2023

Turtle nesting site characterization – June 2023

**Snake emergence surveys** – May/June 2023

**Amphibian surveys** – Spring/Summer 2023

General mammal surveys (not including bats) – Spring/Summer/Fall 2023 and winter 2024 (during other surveys and inventories)

#### **15.2.3 – Aquatic Environment**

Field surveys will be conducted prior to the initial design stages to identify the presence of fish (including SAR/SOMC) and fish habitat (including aquatic, semi-aquatic and riparian habitats) within the Project area. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help shape proposed mitigation, enhancement measures and compensation measures if required.

After field surveys are conducted and a list of aquatic species, SAR/SOMC and potential fish habitat are identified, species-specific mitigation measures and permit requirements will be identified, and a management approach will be developed.

## Project Commitments

- Appropriate and reasonable timing windows for in-water works will be determined with the appropriate federal and provincial authorities during the detailed design stage. Provincially established timing windows are available for the Lac Dollard-des-Ormeaux reach of the Ottawa River from both Ontario and Quebec natural resource management agencies. The appropriate timing window for the Project will be discussed with approval agencies and will be scientifically based on the species present in the area, and their likelihood of using habitat in the area for specific sensitive life periods (e.g., spawning and incubation of eggs, spawning migration, etc.).
- The EPP will include an Erosion and Sediment Control (ESC) Plan that will be developed, implemented and enforced during construction to reduce potential impacts on water quality. The ESC Plan will include a multi-barrier approach defining the location and design of control mechanisms such as silt fencing, rock check dams, straw bale filters, drain covers, filter fabric under catch basins frame and gates and mud mats, as required. In addition, the EPP will include a Fish and Fish Habitat Protection and Offsetting Plan.
- Erosion and sedimentation control (ESC) measures will be implemented and maintained throughout all stages of construction to protect the receiving waters and surrounding environment. ESC measures will be installed around the extent of the construction work zone(s) as well as around the perimeter of stockpiles required for construction. All activities, including maintenance procedures, will be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the water.
- A spill prevention and management plan will also be developed for the Project.
- The deconstruction of the existing piers and in particular, the construction of new piers, will require review by the Department of Fisheries and Oceans Canada (DFO) and possibly by the provincial authorities (MNRF/MEFCCWP). DFO authorization can only be provided after the Impact Assessment Agency determination is issued, and provincial authorizations will require a detailed design. As a preferred design is determined and detailed design is in progress, DFO and the provincial authorities will be engaged through the submission of a Request for Review and follow-up consultation. The Project will require review by DFO and is expected to require a Fisheries Act authorization. A typical condition of a *Fisheries Act* authorization is the requirement for post-construction monitoring over a period of up to three years, or for another period of duration to be discussed with DFO.

## STUDIES

### ***Fish and fish habitat*** – Spring/Summer/Fall 2023

Field surveys to ID the presence of fish (including SAR/SOMC) and fish habitat (including aquatic, semi-aquatic and riparia habitats) within the Project area. Includes the **description of the aquatic habitat (substrate type, aquatic vegetation, riparian vegetation), DFO Species at Risk mapping, electrofishing survey** (if required) and SAR mussel inventory (to support the DFO Request for Review).

Potential additional areas of study to assess alternative temporary wharf locations and other impacted lands if required.

## Project Commitments

### STUDIES

**Climate Change** - Climate Risk and Vulnerability Assessment - 2023/spring 2024, Terms of reference currently under development

**Cumulative effects assessment for Valued Components (VCs)** – 2024-2025

### 16 SOCIO-ECONOMIC SETTING

#### 16.1 – Social Context

IPT is working to assess viable options and determine required supporting infrastructure or services needed to implement suitable mitigation measures. Ideas being evaluated include enhancement to existing pathways to improve usability and serviceability including in winter and development of temporary structures to remove potential barriers for all users including those with reduced mobility.

### STUDIES

**Transportation Impact Assessment** – 2024-2025

#### 16.2 – Economic Context

The bridge closure has the potential to reduce tourism (contributor to the NCR's GDP) in the area which will affect businesses operating within proximity to the bridge. This includes NCC tenants as well as the wharf, boat launch and marina in Jacques Cartier Park. This would result in a loss and/or decrease in revenue to these businesses/tenants and the community. As such the IPT will work with all small business owners and NCC will work with its tenants to develop strategic plans to mitigate impacts.

The IPT will explore a few different measures to mitigate the negative impacts of the bridge closure on the active users and on affected businesses:

- Alternative temporary or permanent relocation option of important infrastructure such as the wharf, boat launch, marina and parking areas to support continued operations during the construction period will be assessed as part of the Project
- The implementation of water taxis or ferry services
- The planning of rerouting strategies and detours
- The implementation of a comprehensive bypass system
- The development of a Construction and Traffic Management Plan.

#### 16.3 – Human Health Context

##### Summary of Issues #26

In the design stages of the Project when more detailed information is known about the Project components, a Human Health Risk Assessment (HHRA) will be completed following Health Canada

## Project Commitments

Guidance documents, if required. Specifically, the following guidance documents will be referenced to determine the need for additional assessments:

- Health Canada, 2017. Guidance for evaluating human health impacts in Environmental Assessment: Drinking and recreational water quality.
- Health Canada, 2017. Guidance for evaluation human health impacts in Environmental Assessment: Country foods.
- Health Canada, 2019. Guidance for evaluating human health impacts in environmental assessment: Human health risk assessment.

### 16.3.1.2 – Mitigation and Protective Measures

Mitigation measures will align with best management practices (BMPs), and Health Canada’s guidance (noise), Environment and Climate Change Canada’s guidance (dust) as well as any other applicable regulations and by-law.

- Mitigation measures to minimize the impacts from noise and/or vibration.
- Mitigation measures to minimize the impacts from air emissions and dust
- Work with the public and key stakeholders, during public consultations and other engagement to develop a strategic action plan to address concerns related to the loss of green space.
- Explore options to ensure the real and perceived safety of individuals crossing or using the bridge (panic buttons and camera surveillance; illumination/ lighting of the bridge and surrounding area(s), include in the design a segregated pathways/ boardwalk)

## STUDIES

**Human Health Risk Assessment (HHRA)** – completed during design stages if required

### 16.4 – Design and Heritage of Structure

- Document and record all elements of the existing bridge, preserve and enhance existing views to and from the bridge, and will use materials (such as local stone in piers, steel in the structure) that take inspiration from and/or reuse materials from the existing structure. Where deemed appropriate (and possible) interpretive panels and other items that preserve the memory, significance of the bridge as well as the heritage of surrounding areas, will be incorporated. The IPT will collaborate with museums to explore the possibility of a museum exhibit about the bridge.
- A Heritage Impact Analysis (HIA) is planned to help inform the conservation decision-making process by assessing the value of the Alexandra Bridge within its broader cultural landscape setting, and provide a comprehensive understanding of the heritage value and character-defining elements unique to the structure and its cultural landscape setting

## Project Commitments

### STUDIES

**Heritage Impact Analysis (HIA)** – Winter 2022 to Winter 2024

Terms of Reference currently under development

**Bridge Heritage Recording** and other mitigation work – On-going

### 16.5 – Archaeological Potential

- Develop a strategy that places priority on managing sites that are prone to erosion and may contain archaeological resources.
- Conduct research to more accurately determine the extent of known archaeological sites.
- Manage known archaeological sites in collaboration with the Algonquin people and in accordance with the Protocol for the Co-management of Archaeological Resources (2017) and Parks Canada’s Cultural Resource Management Policy (2013).
- Recognize and promote the educational value of archaeology and heritage.

### STUDIES

**Land-based Archeological inventories** (for defined areas as required)

**Underwater archaeological survey** of the riverbed near the shoreline (for defined areas as required)

### 16.6 – Navigation and Waterway Activities

The wharf, boat launch and marina in Jacques Cartier Park are within a space that could form part of the practical work area to support construction activities (see Section 10.5.1 for additional information). Public access to these facilities may not be possible due to public safety concerns. The NCC has agreements with tenants for those facilities which support local tourism businesses. These businesses will be impacted by construction activities. Engagement with affected stakeholders will be key to understanding potential impacts to existing commitments and businesses that are dependent on the Park’s facilities to reconcile challenges and limitations and minimize potential impacts.

- When possible, keep a channel open for recreational boating, provide one or more marked channels to ensure safe passage and have the required notices to users of marinas and other anchoring facilities.
- Communications with marinas in the vicinity of the work;
- Issue notices to boaters regarding temporary and permanent obstructions;
- Deconstruction of the piers of the present bridge will be completed to a depth required to ensure that the navigation channel is not obstructed and address potential hazards across the river.
- Signage will be required during the Project to advise mariners of changes to navigation.

During deconstruction of the existing bridge, bathymetric surveys could be required to ensure that the remains of the piers do not cause obstacles to navigation.

## Project Commitments

### 20 – ESTIMATED GREENHOUSE GAS EMISSIONS

To reduce GHG emissions:

- Limit changes to existing land and river infrastructure to a minimum to reduce fuel usage related to land clearing and earthwork.
- Implement traffic planning to avoid traffic delays/vehicle idling and substantial detour during bridge deconstruction and construction activities.
- Provide mass transportation for workers from/to the site (e.g., shuttles).
- Properly maintain heavy equipment and vehicles to reduce fuel consumption.
- Consider using local materials, bridge materials with the least environmental and carbon impact based on a life cycle assessment, or the specific manufacturing technology that involved recycled steel.
- Incentivize active transportation via bridge design and ensure readiness for future public transit links.
- Divert construction waste from landfills (aim for 90% diversion rate)
- Consider using biofuels in heavy/construction equipment where feasible
- Consider using energy efficiency lighting systems or renewable energy (e.g., solar cells) for signs and bridge lighting.
- During the construction stage, annual emissions will be calculated based on the number of kilometres travelled by the machinery and transportation of materials and excavations. Compensation may take the form of buying carbon credits or of carrying out independent Projects.

The Project will release GHG emissions during the construction and operation stages. These emissions will be accounted for in annual provincial and federal GHG totals. The Project is not anticipated to hinder the Government of Canada's efforts to reduce GHG emissions.

### STUDIES

**Greenhouse Gas (GHG) Analysis** (Deconstruction and Construction)– Information will be updated once details of the Project are known. GHG Analysis planned for 2025.

### 21 – GENERATED WASTE AND EMISSIONS

#### 21.1 – Non-hazardous solid waste

Pursuant to PSPC's Real Property Sustainability Framework (v2015) and the Real Property Sustainable Development and Environmental Strategy (PSPC 2018) and in response to the FSDS 2019-2022 and the Treasury Board's Greening Government Strategy (TBS 2020), all Projects greater than \$1 million must implement Construction, Renovation and Demolition (CRD) waste management practices. These practices are comprised of reduction, reuse and recycling initiatives to achieve a minimum non-

## Project Commitments

hazardous waste diversion rate of 90%, striving to achieve 100% diversion by 2030, and reduce the Project's waste intensity (tonnes/m<sup>2</sup>) by 5%, where feasible.

- Complete a Waste Audit: determines the types and volumes of construction materials that will be produced as surplus to the Project, as well as the preliminary options and diversion potentials for waste reduction, reuse and recycling.
- Complete a Waste Reduction Work Plan: identifies the overall waste diversion goal and material specific targets. It describes Project specific procedures to maximize the recovery of those materials identified in the Waste Audit.

### 21.2 – Hazardous solid waste

If subject hazardous waste is generated or found to be present as defined by provincial regulations (i.e. Environmental Protection Act, for Ontario Regulation 347, General – Waste Management or Quebec Environment Quality Act, Land Protection and Rehabilitation Regulation Q-2, r. 37), this material must be managed in compliance with respective regulation. Additionally, subsequent shipments of hazardous waste deemed to be a dangerous good in accordance with the Transportation of Dangerous Goods Act and Regulations must be conducted in compliance with the Act and Regulation.

## PLANS

### Waste Audit

### Waste Reduction Work Plan

## 22 – ENVIRONMENTAL PROTECTION

An Environmental Protection Plan (EPP) will be developed by the construction team for the Project. The EPP is anticipated to include the following:

- Accident and Malfunction Response Plan
- Spill Response Plan
- Material Management Plan
- Erosion and Sediment Control Plan
- Waste Management Plan
- Heritage Conservation and Mitigation Plan
- Tree Protection and Compensation Plan
- Contaminated Soil Management Plan
- Invasive Species Management Plan
- Construction Air Pollutant Emissions Reduction Plan
- Isolation and Dewatering Plan
- Environmental Protection Plan for Construction
- Site Restoration Plan
- Communications Plan
- Fish and Fish Habitat Protection and Offsetting Plan





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- Wildlife Management Plan
- Navigation Management Plan

Environmental monitoring will be implemented to confirm appropriate mitigation measures are in place, maintained and functioning during the construction stage.

### 3.3 Legislative Requirements, Standards and Guidelines

The work will be conducted in accordance with all applicable environmental requirements under federal and provincial laws, regulations, guidelines and standards including but not limited to the following:

#### Federal

- *Impact Assessment Act* (S.C. 2019, c. 28, s. 1)
- *Physical Activities Regulations* (SOR/2019-285)
- *Species at Risk Act* (S.C. 2002, c. 29)
- *Fisheries Act* (RSC, 1985 c. F-14)
- *Migratory Birds Convention Act, 1994* (S.C. 1994, c. 22)
- *Canada Wildlife Act* (R.S.C., 1985, c. W-9)
- *Canadian Navigable Waters Act* (R.S.C., 1985, c. N-22)
- *National Capital Act* (R.S.C., 1985, c. N-4)
- COSEWIC Status Reports
- *Canadian Environmental Protection Act, 1999* (CEPA 1999)
- Canadian Council of Ministers of the Environment (CCME), Guidelines and Guidance documents
- Health Canada Guidance documents
- *Transportation of Dangerous Goods Act, 1992* (S.C. 1992, c. 34)
- Federal Sustainable Development Strategy and PSPC Department Sustainable Development Strategy
- PSPC Real Property Sustainability Handbook, Implementing the Sustainable Development and Environmental Strategy

#### Provincial

- *Ontario Environmental Protection Act* (R.S.O. 1990, c.E.19), Environmental Compliance Approvals (ECA) for Wastewater, Waste, Air, and Noise
- Ontario, *Environmental Assessment Act* (R.S.O. 1990, c. E.18)
- Ontario, *Endangered Species Act* (S.O. 2007, c. 6)
- Ontario, *Invasive Species Act* (S.O. 2015, c. 22)
- Ontario, *Fish and Wildlife Conservation Act, 1997*, S.O. 1997, c. 41
- Ontario *Water Resources Act* (387/04), Permit to Take Water or (PTTW)

- Ontario *Heritage Act* (R.S.O. 1990, c. O.18), Archaeological clearance, and Review of Built Heritage and Cultural Landscape
- Ontario *Dangerous Goods Transportation Act* (R.S.O. 1990, c. D.1)
- Quebec *Environmental Quality Act* (Q-2)
- Quebec *Act respecting threatened or vulnerable species* (e-12.01)
- Quebec *Act respecting the conservation and development of wildlife* (c. 61.1)
- *Water Resources Preservation Act* (c. 21, s. 32)
- Quebec *Cultural Heritage Law* (P-9.002), Archaeological research permit
- Quebec *Highway Safety Code* (c. 24.2, s. 622) - Transportation of Dangerous Substances Regulation

### **Municipal**

- City of Ottawa, Tree Protection (By-law No. 2020-340)
- City of Ottawa, Protocol for Wildlife Protection during Construction, 2015
- City of Ottawa, the Noise By-law Number 2017 -255
- City of Gatineau, Noise By-law 44-2003
- City of Gatineau Tree Protection guidelines
- All applicable Acts, By-laws, Zoning By-laws, licenses and permits

### **Guidelines**

- Standards and Guidelines for the Conservation of Historic Places in Canada
- Clean Equipment Protocol for Industry, Inspecting and cleaning equipment for the purposes of invasive species prevention, Ontario, 2013
- Protocol for Wildlife Protection during Construction, Ottawa, 2015
- *Fisheries Act* Standards and Code of Practice
- Projects near water review, Department of Fisheries and Oceans (DFO)
- Ontario Ecological Land Classification
- PSPC National Species at Risk Protocol
- NCC's Bird-Safe Design Guidelines
- *Ontario Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat*
- *Quebec Freshwater timing windows for carrying out work in fish habitat*

### **NCC Plans and Guidelines**

These documents will form the basis of the proposed Project's evaluation under the FLUDTA process. A few of the most critical documents which will impact the analysis of the Project include:

- The Plan for Canada's Capital 2017-2067 (2017)
- Canada's Capital Core Area Sector Plan (2005), currently under review
- Confederation Boulevard Guidelines, Management and Stewardship of Our Capital Legacy (2011)
- Ottawa River North Shore Parklands Plan (2018)
- Canada's Capital Views Protection Plan (2007)

- Capital Illumination Plan, 2017-2027 (2017)
- Capital Pathway Strategic Plan (2020)
- NCC Sustainable Development Strategy, 2018-2023 (2018)
- Capital Design Guidelines
- Cultural Landscapes Guide

**Project specific direction**

- Planning and Design Principles (2021)
- Performance Criteria for Bridge Design (2022)



## 4 SUMMARY OF PUBLIC ENGAGEMENT

The following section provides an overview of the public engagement process for the Project and its outcomes to date. It includes summaries of past public engagement activities, along with a description of public engagement initiatives that are scheduled to occur throughout the lifecycle of the Project.

### 4.1 Scope of Engagement

As part of the ongoing public engagement process, the IPT is seeking input on the following key considerations:

- Concerns related to potential health, social, economic, and environmental impacts
- Possible mitigation and enhancement measures
- Ways of commemorating the Alexandra Bridge after it is replaced
- The design of the new bridge
- The construction timelines for the new bridge
- The public engagement process (how, when, and with whom to consult)

### 4.2 Public Engagement Timeline

There will be several opportunities for members of the public to provide feedback on the Project throughout the different stages. In total, there will be a minimum of five (5) public consultations, per the proposed timeline and schedule highlighted below:

#### Pre-planning Stage (2020–2022)

- Develop vision and Planning and Design Principles
- Public consultation 1A: Planning and Design Principles, potential impacts and mitigation
- Adjacent landowner/neighbouring stakeholder consultation
- Public consultation 1B: What has been heard to date, updates on the Project, gather input on additional potential positive or negative impacts and potential solutions

#### Planning Stage (2023–2025)

- Development of design options
- Public consultation 2: Functional Design options
- Public consultation 3: Preliminary Design
- Public consultation 4: Detailed Design

#### Procurement and Implementation Stages (2025–2032)

- Procurement process to award design and construction contract
- Public consultation 5: final design and construction plan
- Deconstruction of existing structure and start of new bridge construction

How these different public consultations fit into the overall Impact Assessment process is outlined in Section 4.6. The IPT will engage with stakeholder groups on an ongoing basis, for the life of the Project.

### 4.3 Who will be Engaged

In collaboration with PSPC, the NCC has identified and developed a list of 650+ stakeholder groups at the local, regional and national level who may be affected by or have an interest in the Project (refer to Appendix A for the list of stakeholders).

In applying a Gender-Based Analysis Plus (GBA Plus) lens to the development of the stakeholder list, the IPT made best efforts to include stakeholder groups that represent and/or whose membership reflects Canadians in all their diversity. As such, identified groups included in the list are various in type and vocation, and include community associations, local employers, women's organizations, cultural institutions, foreign missions, organizations that provide services to newcomers, tourism associations, sports clubs, business and industry groups, homeless shelters, environmental organizations, and active mobility advocacy groups, among others. The NCC Public Affairs team compiled contact information for all the groups included in the list so that they could be provided with updates on the Project and notified of public engagement opportunities. The list of stakeholder groups will be updated throughout the Project as the IPT broadens and refines their outreach initiatives.

The IPT connected with the Women and Gender Equality (WAGE) group for guidance on the application of a GBA Plus approach for all stages of the project. A thorough understanding of inequalities in the context of the project will form an integral base of a diversity of perspectives, with the overall aim of ensuring fairness and equality.

A resource suggested for this purpose was the Statistics Canada Gender, Diversity, and Inclusion Statistics. This information is presented as disaggregated data for intersectional analyses. These data can be divided for a series of diverse population groups, such as ethnic origin, sexual orientation, gender, sex, Indigenous identity, immigrant status, persons with a disability, and age (Statistics Canada, 2022).

Information gathered to protect vulnerable populations upon the approval of large infrastructure projects highlights the need for protection of Indigenous women, girls and two-spirit people. The Murdered and Missing Indigenous Women and Girls (MMIWG) final report from the National Inquiry stresses the importance of assessing resource development projects for risks posed by an influx of temporary workers (Culbert, 2019). Implementing policing, social services, health services, and policies on gender, anti-harassment and inclusion commensurate with a project's social infrastructure can provide sufficient support for employees as well as the local community (Zingel, 2019).

For the Alexandra Bridge replacement project, the application of GBA Plus perspectives is likely to include:

- Collection and analysis of baseline data for diverse population groups in the project area
- Clear definition and communication of public spaces during the project phases
- Establishment and continuation of safe workplace spaces where issues can be raised
- Ensuring resources are adequately staffed
- Policies and training related to gender, inclusion, and preventing violence in the workplace
- Capacity for Indigenous communities to monitor and report on progress
- Codes of conduct for the workplace and for workers outside of hours
- Mechanisms for oversight and enforcement

In addition, the IPT will also engage individuals and organizations subscribed to the NCC's Public Engagement or project-specific public newsletters. These approximately 3000 subscribers include a variety of interest and user groups, heritage organizations, and members of the general public.

All public consultations will be advertised in local newspapers and on a variety of digital platforms to raise awareness about the Project and ensure that bridge users, community members, and interested members of the public are given opportunities to participate in the public engagement process.

The IPT will also be creating smaller targeted outreach opportunities with major institutions, commercial operators, client groups, and stakeholders in the immediate vicinity of the proposed Project to ensure that impacts from all aspects of the Project are understood and addressed to the extent possible.

## 4.4 Public Engagement and Outreach Methods

Public engagement initiatives conducted throughout the Project's lifecycle will leverage the following tools and approaches:

- **Project webpages** on the NCC and PSPC websites include the most up-to-date information on the Project and news about current and upcoming opportunities to provide feedback on the Project.
- **Online questionnaires** for the various stages of public consultation that provide participants with an opportunity to comment on different aspects of the Project.
- **Targeted stakeholder meetings** at various stages of the Project.
- **Public, in-person consultation events** (e.g., workshops, design charettes, open houses) once the COVID-19 pandemic restrictions have eased and public health officials advise that it is safe to resume indoor public events.
- **Blog posts** about the Project's status, proposed designs, and the history and built heritage of the Alexandra Bridge.
- **Drone footage** that showcases the Alexandra Bridge, current conditions on site, and construction once it has begun.
- **Social media messages** that provide updates on the Project's status, and responses to questions from members of the public, and that promote current and upcoming public engagement activities.

- **Community paper op-eds** that provide Project updates, discuss key design decisions, and showcase upcoming opportunities to provide feedback on the Project.
- **3D renderings** that illustrate proposed designs.
- **Advertising** across multiple online platforms.
- On-site **panels** with information about the Project and upcoming public engagement activities
- Project **newsletters** with updates on the Project's status.
- **News releases** to announce public engagement events.
- **Public consultation reports** that summarize the feedback provided during each stage of public consultation and indicate how the feedback was used by the Project team.

## 4.5 Summary of Past Engagement with the Public

### 4.5.1 Consultation 1A: meetings with stakeholders – Fall 2020

As part of the Project's pre-planning stage (2020-2021), the first round of public consultations was held on October 21 and 22, 2020. Consultations included two virtual meetings, as a result of COVID-19, with stakeholders, offered in both official languages.

The meetings featured a presentation about the Project, a Question & Answer (Q&A) period, and three (3) discussion sessions during which participants were invited to provide their input on potential impacts, mitigation measures, the proposed Planning and Design Principles (formerly referred to as the Design Guidelines during the first phase of consultations), and future opportunities for public engagement. Over 650 stakeholder groups were invited to attend the meeting of their choice (refer to the full list included in Appendix A).

Of those groups, a total of 15 participated in the meetings:

- Association des résidents et résidentes de l'Île-de-Hull
- Action vélo Outaouais
- Byward Market Business Improvement Area
- Club des ornithologues de l'Outaouais
- Chambre des commerces de Gatineau
- Envirocentre
- Federation of Community Associations
- Heritage Ottawa
- Ottawa-Gatineau Geoheritage
- Rideau Valley Conservation Authority
- Rockcliffe Park Residents' Association
- Rockcliffe Yacht Club
- Transport Action Canada
- Ville de Gatineau

A public consultation report summarizing the input provided by participants and indicating how this feedback was used has been published on the NCC website. This report is provided in Appendix B.

Table 4-1 provides a summary of the key issues raised by stakeholders during this session, along with proposed mitigation and enhancement measures.

**Table 4-1: Summary of the key issues raised by stakeholders**

Description of impact / enhancement	Proposed mitigation / enhancement measure(s)	Raised by*	Integrated Project Team's response
<b>The Alexandra Bridge is an important connection for active mobility, and its closure will be highly disruptive for these users. Detours are often long and poorly planned.</b>	Make the planning and implementation of active mobility detours a priority rather than an afterthought.	Environmental group	Alternative routes and services to support safe and connected active mobility will be considered in the bridge planning stage of the Project. Concerns and proposed mitigations will be communicated to the design team for consideration.
	Enhance ferry service while the bridge is closed.	Community association	
<b>Certain other bridges that will be used as alternatives by active mobility users during construction are not safe.</b>	Make active mobility as big of a priority as vehicular traffic in your construction milestones. Do not neglect the active mobility lane in favour of vehicular lanes.	Active transportation group	Alternative routes will be well marked and easy to follow.
	Make documentation with analysis of decision to replace rather than rehabilitate the bridge publicly available.	Transportation group	Documentation supporting the decision (and updates) is provided on the PSPC website at: <a href="https://www.tpsgc-pwgsc.gc.ca/biens-property/pdb-bdd/alexandra-eng.html">https://www.tpsgc-pwgsc.gc.ca/biens-property/pdb-bdd/alexandra-eng.html</a>
	In design of new bridge, provide separate lane for service and emergency vehicles.	Recreational group	Proposed measure will be communicated to the design team for consideration. Note that the functional requirements (including total # of lanes, see section 8.3) have already been established in collaboration with both municipalities.



Description of impact / enhancement	Proposed mitigation / enhancement measure(s)	Raised by*	Integrated Project Team's response
<b>Other bridges have little capacity to absorb traffic that will have to be rerouted from the Alexandra Bridge during closure.</b>	Work closely with stakeholders to devise appropriate mitigation measures.	Local government	Communication with regional partners, including the City of Ottawa, the Ville de Gatineau, the Société de transport de l'Outaouais (STO), and OC Transpo will continue throughout the Project. Measures for traffic control will be planned in conjunction.
<b>The closure will likely significantly disrupt the flow of vehicular, active, and commercial transportation.</b>	Work closely with stakeholders to devise appropriate mitigation measures.	Local government	
<b>The closure will likely negatively affect tourism in the region by limiting circulation between tourist destinations.</b>		Active transportation group	
<b>The new bridge could further minimize the effects of the vehicular lane on active mobility users.</b>	Design the new bridge in a manner that encourages vehicular users to reduce their speed.	Community association	The functional requirements include a separate active transportation lane (pedestrians and cyclists) on the upstream side of the bridge (west). The active transportation lane will be two-way and provide separation between pedestrians and cyclists. The active transportation route should include pedestrian benches as well as one or more improved observation points. The Planning and Design Principles (refer to Appendix G) emphasize the importance of ensuring the security and comfort of active transportation users and note the importance of controlling vehicular speed through design. Proposed mitigation will be communicated to the
	Design the bridge in a manner that discourages growth in vehicular traffic and instead promotes active mobility.	Active transportation group	
	Create a sound barrier between vehicular lanes and the active mobility lane.		

Description of impact / enhancement	Proposed mitigation / enhancement measure(s)	Raised by*	Integrated Project Team's response
			design team for consideration.
<b>Once the Project is complete, a return to the status quo in terms of vehicular traffic volume is undesirable.</b>	Consider designing the new bridge exclusively for active mobility	Active transportation group	Proposed mitigation will be communicated to the design team for consideration.
	Limit the use of the new bridge to public transit and active mobility.	Environmental group	
<b>There are unique geological assets in the area that could be affected by the Project.</b>	Implement measures to identify and preserve geological assets.	Environmental group	Environmental studies will be conducted to meet provincial (Ontario and Quebec) and federal regulatory requirements. Information from the studies will guide the Project planning and design along with any additional recommended measures to reduce impacts. The Planning and Design Principles require that sustainability and minimizing environmental impact be considered as an integral part of the design.
<b>There is a risk that environmental impact studies will only be considered late in the planning process.</b>	Adopt an environmentally friendly approach to planning from the outset of the Project. Make it a part of the vision.	Environmental group	The Planning and Design Principles provide direction for the bridge design to achieve excellence in terms of sustainability, and in particular protection and enhancement of natural features of the Ottawa river and its shoreline. Environmental studies examining potential impacts and mitigation are being undertaken in keeping with IA process and will inform the Project design.

Description of impact / enhancement	Proposed mitigation / enhancement measure(s)	Raised by*	Integrated Project Team's response
<b>The length of time during which the bridge will be closed</b>	Build the new bridge alongside the original as it is being decommissioned so as to minimize the period during which the crossing would be closed.	Community association	Concern and proposed mitigation will be communicated to the design team for consideration.
<b>Some previous bridge Projects lacked transparency and resulted in sub-optimal outcomes for certain users.</b>	Make Project plans public and share them with stakeholders up front.	Active transportation group	A thorough, multi-stage public engagement approach which will carry through the Project planning and implementation stages will seek to engage stakeholders to identify key issues and concerns, validate and improve upon the design and identify mitigation measures throughout the Project life cycle.
<b>The new bridge could be better adapted for public transit.</b>	Include the potential integration of light rail in the Planning and Design Principles.	Transportation group	The functional requirements include the potential to adapt the structure for use by a tram or light rail system as part of a future upgrade.
<b>The only bridges used for transit are in the west end. There is an interprovincial public transit gap in the east end.</b>	Adapt new bridge for public transit.	Transportation group	Issue and proposed mitigation will be communicated to the design team for consideration.
<b>Many people view the existing bridge as a significant technological achievement and are very attached to it.</b>	Discuss heritage plans with the public as early as possible in the process.	Transportation group	Concern and proposed mitigation will be communicated to the team undertaking a Heritage Impact Analysis (HIA).
	Make preserving the memory and significant elements of the bridge a priority.		The HIA and proposed bridge recording will inform options for commemoration, preservation and

Description of impact / enhancement	Proposed mitigation / enhancement measure(s)	Raised by*	Integrated Project Team's response
			dissemination of bridge heritage and history.
<b>Current interpretation panels do not feature information about the natural environment that surrounds the bridge.</b>	Include interpretive panels about the local flora and fauna.	Environmental group	Concern and proposed mitigation will be communicated to the design team for consideration.
	Include digital interpretive panels that feature dynamic and interactive content.		
<b>Risk that new bridge's design does not adequately take winter into account.</b>	Ensure that snow is cleared in areas where users go to enjoy the new bridge, including around interpretive panels.	Environmental group	Proposed mitigation will be communicated to the public engagement team.
	Include visuals of what the bridge would look like in the winter for future public consultations.		
<b>From a tourism and iconic perspective, NCR bridges are very dark.</b>	Ensure new bridge follows NCC's Capital Illumination Plan ( <a href="#">NCC 2017-2027</a> ) as well as the Planning and Design Principles.	Business group	Concern and proposed mitigation will be communicated to the design team for consideration.
	Consider designing the bridge so that users can enjoy views on both sides.	Community association	
	It is a great idea to integrate public art into the design, and to create connections with the National Art Gallery	Environmental group	

Description of impact / enhancement	Proposed mitigation / enhancement measure(s)	Raised by*	Integrated Project Team's response
	and Canadian Museum of History.		
	Find creative ways to engage during the pandemic (e.g., consultations in outdoor public spaces, or on site at the Alexandra Bridge).	Environmental group	Public engagement and outreach methods will be varied and include a Project website page (PSPC and NCC), social media platform messaging Project news releases bridge on-site information on-going engagement for feedback through questionnaires, targeted stakeholder meetings, and public in-person events (workshops, charettes, etc.) when permissible.
	Be proactive in your engagement. Don't wait for communities to come to you.		Proposed mitigation will be communicated to the public engagement team.
	Continue holding online consultations after the pandemic is under control.		
<b>Potential effects of construction on Boulevard des Allumettières</b>		Business group	Communication with regional partners including the City of Ottawa, the Ville de Gatineau, the Société de transport de l'Outaouais (STO), and OC Transpo will continue throughout the Project to address potential impacts to other infrastructure from the Project.
<b>Potential effects of construction on commercial traffic on the Macdonald-Cartier bridge</b>		Business group	Concern will be communicated to the design team for consideration.
	Look to the Pont Champlain Project in Montreal as an example from which to draw important lessons.	Environmental group	Suggestion is being actively pursued.

Description of impact / enhancement	Proposed mitigation / enhancement measure(s)	Raised by*	Integrated Project Team's response
<b>The Alexandra Bridge is one of the most beautiful places in Canada.</b>	In designing the new bridge, look to international examples of design excellence, like the Banpo Bridge in South Korea, for inspiration.	Business group	Concern and proposed mitigation will be communicated to the design team for consideration.
	Consider holding a design competition for the new bridge.	Active transportation group	
<b>The Project will create business opportunities and jobs, which will hopefully benefit the local economy.</b>	Create opportunities for local contractors to contribute to the Project.	Business group	Concern and proposed mitigation will be communicated to decision makers for consideration.

\*As part of the initial public consultation, participants were not asked to self-identify. Only the name of the group is identified above. In all future public consultations, stakeholders will be asked to self-identify.

#### 4.5.2 Consultation 1A: online public consultation – Fall 2020

The first round of online consultation for the Project was held between November 3 and 16, 2020. The online consultation for this Project was divided into two parts. Participants were first directed to a webpage on the NCC's website that provided information on the following:

- The Project's background, functional requirements, and timeline
- Possible impacts and mitigation measures
- Proposed vision and Planning and Design Principles for the new bridge
- Objectives of the first stage of public consultation

Participants were then invited to complete an online questionnaire about different aspects of the Project. This included a section devoted to potential impacts and mitigation measures in which participants were invited to share their concerns about the Project and propose ways to address those concerns.

Participants were also given the option of providing feedback via email or by calling the NCC's contact centre.

An email invitation to participate in the online consultation was sent to the NCC's Public Engagement newsletter subscriber list. The same invitation was sent to all stakeholder groups listed in Appendix C (provided as a separate document) to be shared with their members and clients.

Messages were posted on the NCC’s social media accounts (Facebook and Twitter), soliciting the participation of all interested members of the public.

A paid digital advertising campaign was also launched on the platforms listed in Table 4-2 throughout the duration of the online consultation:

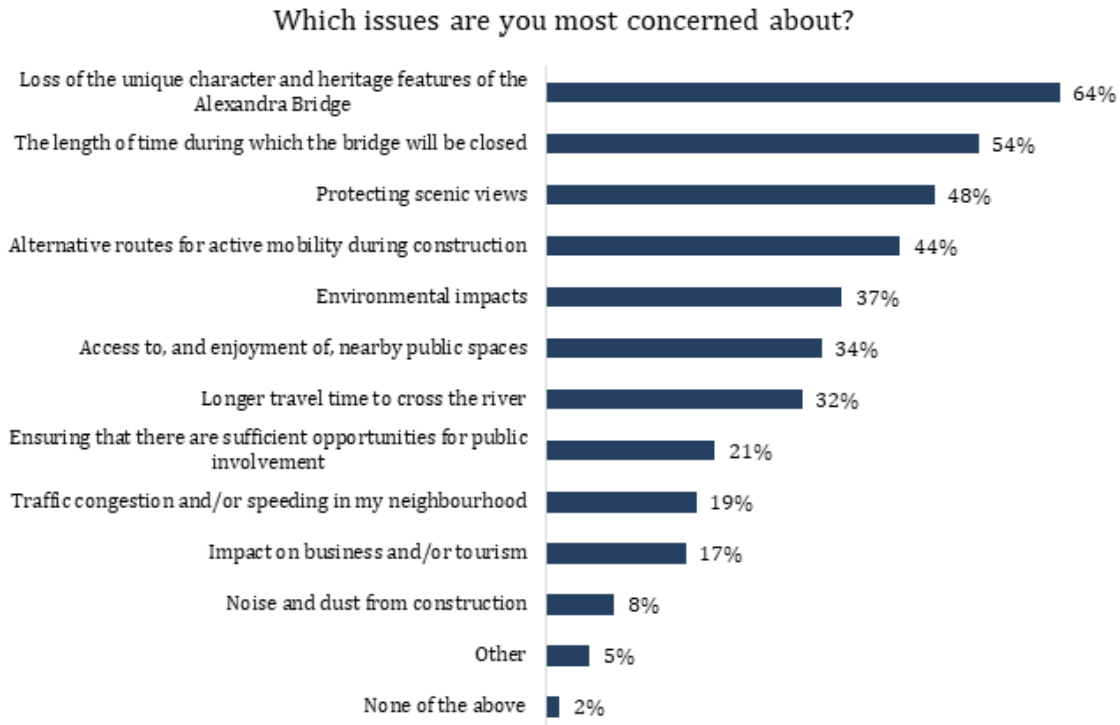
**Table 4-2: Paid digital advertising campaign platform**

Print	Digital
<b>LeDroit</b>	Google
<b>Ottawa Citizen</b>	Facebook
<b>Metroland Media (Arnprior, Carleton Place, Kemptville, Perth, Smith Falls)</b>	Twitter
	LinkedIn
<b>OCNA (Alexandria-Glengarry, Lanark, Morrisburg and Prescott-Russell)</b>	LeDroit
<b>Réseau Sélect (La Petite Nation, Cornwall Express, L'Envol)</b>	Ottawa Citizen
	The Hill Times
<b>Vision Clarence Rockland</b>	Ottawa Business Journal
<b>Le Reflet (Embrun)</b>	First Nations Drum East
<b>QCNA Fort Coulonge (Journal du Pontiac), Chelsea (Low Down to Hull &amp; Back), Buckingham (West Quebec Post)</b>	Metroland Media
<b>Bulletin d'Aylmer</b>	INSIDE OTTAWA VALLEY (Arnprior, Carleton Place, Kemptville, Perth, Smith Falls)
<b>ParaSport Ontario Magazine</b>	Bulletin d'Aylmer
<b>Thrive Magazine</b>	Bell Media Network
<b>First Nations Drum East Newsprint</b>	Pink Triangle Press - Daily Xtra

In total, 3,195 individuals participated in the online questionnaire, of whom 2295 completed it from start to finish.

The Public Consultation Report dated December 2020 (Appendix B), summarizes the input provided by participants. All feedback will be reviewed and where possible, used to inform subsequent consultation and the Project stages.

The following charts and tables provide a summary of the potential impacts raised by participants as part of the online public consultation, along with proposed mitigation and enhancement measures:



Note: This chart illustrates the share of 2,812 respondents who selected each of the answer options listed.

**Figure 4-1: Question: Which issues are you most concerned about?**



Table 4-3 to 4-9 summarize the potential impacts raised by participants as part of the online public consultation, along with proposed mitigation and enhancement measures.

**Table 4-3: Responses to survey question - Which issues are you most concerned about?**

Subject area	Description of issue or concern	Number of respondents who selected issue	Integrated Project Team's response
<b>Public Engagement</b>	Ensuring that there are sufficient opportunities for public involvement	591	The Project will include an additional four rounds of public consultation. The NCC and PSPC will continue to engage with the public and stakeholders on an ongoing basis.  Further details are provided in section 4.5.
	<b>Project Activities</b>	The length of time during which the bridge will be closed	1508
	Longer travel time to cross the river	897	Concern will be communicated to the design team for consideration. Further details are provided in sections 10,11, and 13.
	Access to, and enjoyment of, nearby public spaces	963	
	Alternative routes for active mobility during construction	1237	
	Traffic congestion and/or speeding in my neighbourhood	528	
	Impact on business and/or tourism	487	Communication with regional partners including the City of Ottawa, the Ville de Gatineau, the Société de transport de l'Outaouais (STO), and OC Transpo will continue throughout the Project. In addition, engagement with business and tourism groups as well as nearby institutions and tourism offices began in summer 2021.  Concern will be communicated to the Project team for consideration. Further details are provided in Project Activities.

Subject area	Description of issue or concern	Number of respondents who selected issue	Integrated Project Team's response
<b>Environment</b>	Environmental impacts	1033	<p>Details on anticipated potential impacts and associated mitigation measures are provided in section 15, based on information known to date.</p> <p>Environmental studies will be conducted to meet provincial (Ontario and Quebec) and federal regulatory requirements.</p> <p>Information from the studies will guide the Project planning and design along with any additional recommended measures to reduce impacts.</p>
<b>Environment</b>	Noise and dust from construction	238	<p>An Environmental Protection Plan (EPP) will be prepared, which will stipulate the environmental protection measures and commitments to be carried out by the contractor during construction.</p> <p>Further details are provided in section 15.</p>
<b>Aesthetics and Heritage of Structure</b>	Loss of the unique character and heritage features of the Alexandra Bridge	1795	<p>Concern will be communicated to the team undertaking a Heritage Impact Analysis.</p> <p>Further details are provided in section 16.4.</p>
	Protecting scenic views	1358	<p>The NCC has commissioned a consultant to review potential impacts on scenic views, the findings of which will inform the design of the new bridge.</p>



**Table 4-4: Responses to survey question - Please indicate which other impacts you are concerned about.**

Subject area	Description of impact of concern	Number of mentions	Proposed measure(s)
<b>Project Activities</b>	The cost to taxpayers	6	Cost estimates developed as part of the LCCA (MMM Group Ltd, 2018) determined that indefinite maintenance of the existing structure was more costly over the next 75 years compared to replacement.  Further details are provided in Section 8.
	The new bridge's design will be inferior to that of the Alexandra Bridge	5	The use of materials that have a lower environmental footprint and high durability, and that provide a service life of more than 100 years, are part of the design considerations to reduce the bridge's environmental impact. Further details are provided in Section 8.  Aesthetic considerations are integral to the Planning and Design Principles which will inform the planning process.  Further details are provided in Section 16.4.
	Construction will adversely affect public transportation	2	Communication with regional partners, including the City of Ottawa, the Ville de Gatineau, the Société de transport de l'Outaouais (STO), and OC Transpo will continue throughout the Project.  Concerns will be communicated to the design team for consideration.  Further details are provided in Section 11.
<b>Aesthetics and Heritage of Structure</b>	Loss of heritage and destruction of history	28	Concern will be communicated to the team undertaking a Heritage Impact Study.  Further details are provided in Section 16.4.
<b>Navigation and Waterway Activities</b>	Construction will adversely affect use of the river (e.g., navigability for boats)	13	Planning for the deconstruction of the old bridge and construction of the new one will take into consideration the need to maintain navigation access. Further details are provided in Section 16.6.

Table 4-5 highlights additional comments raised within the survey. Any/all additional comments will be reviewed by the IPT and will inform Project stages, where feasible.

**Table 4-5: Additional comments provided in survey responses.**

Subject area	Additional Comments	Number of mentions	Relevant Section
<b>Indigenous communities Engagement</b>	Consult and involve Indigenous communities in the Project	11	Section 5
<b>Project Activities</b>	Ensure superior design and construction standards	29	Section 8 Section 10
	Add a specific public transit lane or rail line to the bridge	15	Section 10
	Expand the bridge's carrying capacity in the new design	3	Section 10
	Provide alternative routes during construction that avoid traffic congestion	7	Section 10 Section 11
	Rehabilitate the Alexandra Bridge rather than replace it	13	Section 8
	Convert the Alexandra bridge into an active mobility crossing	8	Section 8

**Table 4-6: What kind of measures would you like to see put in place to minimize any adverse effects the Project might have?**

Subject area	Suggested mitigation measure(s)	Number of mentions	Relevant section
<b>Public Engagement</b>	Ensure proactive, transparent and clear communications, as well as widely accessible and meaningful public consultation	88	Section 3.2
<b>Project Activities</b>	Rehabilitate rather than replace the Alexandra Bridge	117	Section 8
	Ensure adequate planning and oversight to guarantee that the Project is completed on time and within budget	39	Section 8
	Implement measures to minimize traffic congestion	204	Section 10
	Build a new crossing before decommissioning the Alexandra Bridge	163	Section 11
	Keep the Alexandra Bridge open for active mobility during construction	69	Section 11
	Hold the new bridge to a high standard and make sure that the job is done right	115	Section 11
	Provide adequate alternative routes for active transportation, including measures like expanding the carrying capacity and enhancing the safety of active mobility lanes on other interprovincial bridges	361	Section 11
	Offer ferry service during construction	90	Section 11
	Reduce by as much as possible the amount of time it takes to build a new bridge	81	Section 11
	Offer shuttle service during construction	47	Section 11
	Clear pathways identified as alternative routes for active mobility during the winter	10	Section 11
	<b>Environment</b>	Carefully assess any potential environmental impacts and develop strategies to mitigate them	68
Implement measures to protect the river from pollution		10	Section 15

These suggested mitigation measures have been or will be considered by the Project team as part of the Project.

**Table 4-7: What would you most want to see improved with the new bridge?**

<b>Proposed improvement</b>	<b>Number of mentions</b>
<b>Better separation of cyclists and pedestrians</b>	615
<b>Enhance public transit services and integrate light rail or tram system</b>	331
<b>Guarantee the level of quality of design and construction befitting of an iconic landmark</b>	282
<b>Replace the metal surface in the northbound lane with something less unnerving to drive over</b>	264
<b>Increase the bridge's carrying capacity</b>	261
<b>Smoother surface for active mobility than that of the existing wooden boardwalk</b>	172
<b>Restore rather than replace the Alexandra Bridge</b>	161
<b>Design the new bridge to attract tourists, with space to take pictures, sit down, and enjoy the views</b>	131
<b>Enhance safety (better lighting, wider lanes, safety nets, better separation of traffic)</b>	70
<b>Make the new bridge beautiful and ensures that it blends in harmoniously with its surroundings</b>	59
<b>Have the design of the new bridge emulate that of the Alexandra Bridge</b>	44
<b>Install rest stops</b>	36
<b>Prioritize sustainability in design and construction</b>	35
<b>Cover the active mobility lane to shelter its users from the elements</b>	11
<b>Integrate nature into the design (trees, green strips)</b>	11
<b>Dedicate the bridge entirely to active mobility</b>	113
<b>Maintain the bridge for the exclusive use of active mobility</b>	54

The above proposed improvements and associated groups who made/mentioned these are outlined in the Public Consultation report (refer to Appendix B).

Documented comments listed in the tables above will be provided to the Design Team for consideration as part of the planning stages of the Project.

**Table 4-8: How would you like to see the history and built heritage of the Alexandra Bridge commemorated after it is replaced?**

Proposed heritage commemoration	Number of mentions
Install on-site placards and displays with information about the history of the bridge and the area where it is located	650
Repurpose the materials of the Alexandra Bridge in the construction of the new bridge and have its design emulate that of the original bridge	441
Create a museum exhibit about the bridge	250
Restore rather than replace the Alexandra Bridge	219
Display archival photographs of the bridge's construction and appearance over the years	127
Use segments of the bridge to create a model/replica to be displayed in an outdoor space or museum	94
Create artwork using pieces of the bridge	60
Support a publication on the bridge's history	35
Include information on the history of the region's Indigenous Peoples	31
Create an online archive with material related to the bridge	15
Recycle material from the bridge to create small commemorative pieces or collectibles	13
Transfer the name of the Alexandra Bridge to the new bridge	7

Documented comments listed in the table above will be provided to the team focusing on the Aesthetics and Heritage component of the Project.

#### 4.5.3 Engagement with Adjacent landowners and neighbouring stakeholders

Adjacent landowners and neighbouring stakeholders have also been engaged. The IPT consulted with the following businesses and organizations in targeted stakeholder sessions during the summer of 2021:

- Canadian Museum of History
- Canadian War Museum
- National Gallery of Canada
- Ottawa Tourism
- Tourisme Outaouais

From the summer adjacent landowners and neighbouring stakeholder consultations, a list (non-exhaustive) of concerns raised was compiled and is highlighted in the Table 4-9, along with proposed responses to mitigate potential impacts.

**Table 4-9: Engagement with Adjacent Landowner and neighbouring stakeholders**

Area of concern or interest	Raised by	Integrated Project Team's response
<p><b>Traffic impact/access</b></p> <p><b>Loss of Heritage</b></p>	Ottawa Tourism	<p>Access between some of the tourism nodes and the adjacent communities will be affected. Adequate detours and other means of transportation to tourist destinations are being explored (e.g., shuttle along Confederation Boulevard).</p> <p>Throughout the Project there will be ongoing engagement with stakeholders to discuss all options.</p> <p>Loss of the current bridge which represents a historically significant landmark in the Capital is a concern. The possibility of preserving some materials of the existing bridge is being assessed. Throughout the Project there will be ongoing engagement with the Canada Science and Technology Museum and the general public to explore options and ideas on how to protect the heritage of the bridge.</p>
<p><b>Loss of Link/Access between Ottawa and Gatineau</b></p>	Tourism Outaouais	<p>It is anticipated that there will be a loss of the short direct link that the bridge provides between Gatineau and Ottawa during the closure. To minimize the impact on users, PSPC is exploring various options, one being the addition of a de-icing system on the river to potentially incorporate a ferry.</p>
<p><b>Noise and Vibration Impacts</b></p> <p><b>Access to the Gallery</b></p>	National Gallery of Canada	<p>Varying pre-work, design work, impact assessments are being completed and there will be on-going discussions with the Gallery.</p> <p>The NCC and PSPC are working together to ensure a seamless access to the Gallery will be included in the design. Throughout the Project there will be ongoing engagement with stakeholders to discuss all options.</p>



Area of concern or interest	Raised by	Integrated Project Team's response
<p><b>Access to facility loading dock</b></p> <p><b>Public and employees' access to main entrance</b></p> <p><b>Closure of Alexandra Bridge at the same time as closure of Portage Bridge</b></p>	<p>Canadian Museum of History/ Canadian War Museum</p>	<p>If and/or when access to the loading dock needs to be constrained, timely communication and a strategy to ensure minimal disruption to operations will be put in place.</p> <p>A strategic communications plan will be developed to support the changes in access accompanied by the appropriate signage will also be displayed</p> <p>The IPT is collaborating with regional partners (cities and transport authorities) to develop a traffic management plan for future works to the interprovincial crossings that may impact traffic volumes and travel times. Closure of multiple bridges will be avoided as part of this Project, should closure need to occur there will be adequate and/or sufficient detours put in place to minimize disturbance to the general public.</p>

**4.5.4 Consultation 1B: meetings with stakeholders – Fall 2021**

A second stage of public consultation was undertaken in Fall 2021, for the Project team to further engage stakeholders. The IPT gathered initial feedback on proposed mitigation measures, enhanced measures and other opportunities for solutions.

Consultation comprised of three (3) parts, including meetings with stakeholders, 1-pager to residents and an online survey.

All stakeholder session meetings occurred virtually, offered in both official languages, from November to January of 2022. Like consultation 1A – each session featured a presentation about the Project, a Question & Answer (Q&A) period, and discussion sessions during which participants were invited to provide their input on potential impacts and mitigation measures.

The IPT consulted with the following businesses and organizations in targeted stakeholder sessions:

- Archdiocese of Ottawa-Cornwall
- Au feel de l'eau
- Brigil
- Canada School of Public Service
- Capital Cruises
- Chateau Laurier
- Croisières Outaouais
- Earl of Sussex Pub
- Global Affairs Canada
- Global Centre for Pluralism
- John RMOR (Tenant)
- Lady Dive Tours
- Ottawa Rowing Club
- Passenger & Commercial Vessel Association
- Public Services and Procurement Canada - Peacekeeping Monument
- Royal Canadian Mint
- Shepherds of Good Hope
- Tavern on the Hill
- Transport Action Canada

Table 4-10 provides a summary of the key issues raised by stakeholders during these sessions, along with proposed mitigation and enhancement measures. It is noted that similar concerns have been raised throughout the consultation sessions. A follow up strategy has been developed to continue to engage with stakeholders to provide updates as the Project becomes more defined and ensure that concerns are heard and appropriately mitigated.



**Table 4-10: Summary of the key issues raised by stakeholders**

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
<b>Concerns related to the closure of the Alexandra Bridge</b>			
<b>Loss of link/access between Ottawa and Gatineau</b>	<p>Access between the tourism nodes, as well as business areas in the vicinity of the Project and the adjacent communities will be affected.</p> <p>The shortest, direct link that the bridge provides between Gatineau and Ottawa during the closure will not be available during construction.</p> <p>Closure of the bridge could impact business operations (negatively for businesses that rely on access to the docking site or who rely on active transportation users, like in the ByWard Market). It could also provide business opportunities that would need to be evaluated.</p>	<p>Earl of Sussex Pub</p> <p>Au feel de l'eau</p> <p>Canada School of Public Service</p> <p>Global Centre for Pluralism</p> <p>Global Affairs Canada</p> <p>Chateau Laurier</p> <p>John RMOR (Tenant)</p> <p>Royal Canadian Mint</p>	<p>Adequate detours for residents, commuters and visitors and other means of transportation to tourist destinations are being explored (e.g., shuttle along Confederation Boulevard).</p> <p>Throughout the Project there will be ongoing engagement with stakeholders to discuss all options.</p> <p>To minimize the impact on users, PSPC is exploring various options, such as a de-icing system on the river to lengthen the water taxi season.</p> <p>Water taxi services (with universal accessibility) could play an important role in providing crossing services to active transportation users. Understanding seasonal limitations will be essential to tailoring the appropriate mitigation.</p>
<b>Access to buildings – services such as loading docks</b>	<p>Concerned about the impacts of changes in traffic flow to access roads, delivery zones and loading docks.</p> <p>Small loading dock accessed from Sussex Drive could be impacted.</p> <p>Advanced planning and communication for alternative access will be required during construction.</p> <p>Ability to receive shipments is critical.</p>	<p>Tavern on the Hill</p> <p>Canada School of Public Service</p>	<p>If and/or when access to loading docks or delivery zones need to be constrained, timely communication and a strategy to ensure minimal disruption to operations will be put in place.</p>

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
<p><b>Access to buildings and amenities– public and employees' access</b></p>	<p>Closure of the bridge could impact employees who use it to get to work, access buildings near the bridge or shuttle between government buildings for meetings.</p> <p>The grounds of surrounding spaces are used for multiple public events including large-scale celebrations which could be impacted by road closures or construction.</p> <p>Concerned about the impacts caused by the change in traffic flow on parishioners and tourists getting to the Notre-Dame Cathedral or adjacent parking lot.</p> <p>Consider access to employee parking on Lady Grey Drive.</p>	<p>Canada School of Public Service</p> <p>Global Affairs Canada</p> <p>Archdiocese of Ottawa-Cornwall</p> <p>Global Centre for Pluralism</p> <p>Chateau Laurier</p> <p>Royal Canadian Mint</p>	<p>The NCC and PSPC are working together to ensure a seamless access to the public spaces will be included in the design. Throughout the Project there will be ongoing engagement with stakeholders to discuss all options.</p> <p>A strategic communications plan will be developed to support the changes in access and detours accompanied by the appropriate signage.</p> <p>Ensuring that information regarding planned public events is communicated between stakeholders and the Project team will assist in understanding needs and preparing appropriate mitigation strategies.</p>
<p><b>Wayfinding</b></p>	<p>Wayfinding and signage of pathways to facilities will be essential to ensure that the public can safely reach the museums and other points of interest.</p> <p>Some stakeholders are engaged in pilot projects that may contribute to enhanced wayfinding. Utilize the findings from these projects to inform development of tools.</p>	<p>John RMOR (tenant)</p>	<p>Wayfinding to reach public facilities as well as general safety of the public in the construction zone will be important aspects of construction planning.</p> <p>Noted for the future planning and follow up conversations.</p>

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
<b>Concerns related to the closure of Alexandra Bridge at the same time as closure of Portage or other bridges</b>			
<b>General access to buildings or services within the area</b>	Access to the buildings would be impacted by closure of multiple bridges at once. Welcome kiosks and boarding for several tour operators are located at Jacques-Cartier Park, which could be impacted by closures of more than one bridge at a time, e.g., on tour buses and other patrons travelling to the park.	Capital Cruises  Passenger & Commercial Vessel Association  Croisières Outaouais  Lady Dive Tours	The IPT is collaborating with regional partners (cities and transport authorities) to develop a traffic management plan for future works to the interprovincial crossings that may impact traffic volumes and travel times. Closure of multiple bridges will be avoided as part of this Project, should closure need to occur, adequate and/or sufficient detours will be put in place to minimize disturbance to the general public. Detours and other changes to traffic patterns will be communicated to tour operators to ensure that clients know how to reach the dock.
<b>Access to tourism nodes and points of interest in the area</b>	Access to tourism services (such as boat tour operators or other points of interest) must be considered when planning detours. For example, some river tour clients arrive at the dock at Jacques-Cartier Park by tour bus, while others come individually. Detours must be communicated so that clients can be informed ahead of time. Consider a shuttle to provide a link to tourism nodes.	Archdiocese of Ottawa-Cornwall  Capital Cruises  Passenger & Commercial Vessel Association  Croisières Outaouais  Lady Dive Tours  Tavern on the Hill  Earl of Sussex	Suggestion is noted and will be considered as part of the mitigation strategies. Detours and other changes to traffic patterns will be communicated to tour operators to ensure that clients know how to reach the dock.

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
<b>Traffic congestion on other bridges and roads</b>	<p>Discussions about what bridges might be used as detour routes and impacts on congestion.</p> <p>Closure of the Alexandra Bridge will have an impact on commuting times.</p> <p>Impact of bridge closures and increased traffic congestion on surrounding neighbourhoods and emergency vehicle routes.</p> <p>Concern that increased traffic congestion on neighbourhood roads may impede or block access to critical assets, e.g. recognized medical sites and emergency drop off zones at 256 King Edward Street.</p> <p>Concern that increased traffic will lead to safety issues caused by increased user conflicts (vehicles/active users).</p>	<p>Global Affairs Canada</p> <p>Shepherds of Good Hope</p> <p>Transport Action Canada</p> <p>Lady Dive Tours</p> <p>Public Services and Procurement Canada (Peacekeeping Monument)</p> <p>John RMOR (Tenant)</p>	<p>The IPT anticipates more congestion on roads and bridges that provide access while the Alexandra Bridge is closed. Active modes and public transportation will be encouraged to ensure to mitigate for vehicular traffic. The IPT is exploring other options such as increased water taxi from the museum to the Rideau Canal locks. Coordination with OC Transpo and STO will also help to put in place access to public transportation. The IPT will continue to work in collaboration with regional partners (e. g. the cities of Ottawa and Gatineau, Ontario and Quebec transportation ministries and public transit authorities) to develop a traffic management plan for future works that may impact traffic volumes and travel times. Closure of multiple bridges will be avoided and adequate and/or sufficient detours will be put in place to minimize disturbance to the general public. Active modes and public transit will be encouraged to mitigate vehicular congestion on other bridges while the bridge is closed for construction.</p>
<b>Active mobility detours</b>	<p>Concerns about the length of the detours for active mobility users and options being considered during the closure of the bridge.</p>	<p>Transport Action Canada</p>	<p>Several options are being considered including water taxis and using technology to maintain the channel open in winter.</p>
<b>Noise, Dust and Vibration Impacts</b>			
<b>Noise, dust and vibration created by construction on bedrock</b>	<p>Vibration may affect artifacts housed in the museum.</p>	<p>Canada School of Public Service</p>	<p>Varying pre-work, design work, impact assessments are being completed and there will be on-going discussions with stakeholders. Structural condition</p>

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
	<p>Vibration caused by construction activities may impact the nearby structures, such as heritage buildings or others.</p> <p>Noise may impact employees working in areas of buildings or facilities that are closest to the bridge or facing the river. Health and safety issue regarding ongoing impacts of noise due to different construction projects. Request for a noise study to be completed.</p> <p>At 373 Sussex, vibrations related to the work could create a health and safety issue related to the presence of asbestos in the heritage buildings (Bloc A and B).</p> <p>Impacts of noise and dust on events, like weddings, planned religious events, ceremonies at the Peacekeeping Monument.</p>	<p>Global Affairs Canada</p> <p>Archdiocese of Ottawa-Cornwall</p> <p>Public Services and Procurement Canada (Peacekeeping Monument)</p> <p>Chateau Laurier</p>	<p>of the museums and other nearby structures before the start of construction will be needed to address specific concerns. Concern is noted for consideration during construction planning.</p> <p>Ensuring that information regarding planned public events is communicated between stakeholders and the Project team will assist in understanding needs and preparing appropriate mitigation strategies.</p> <p>Throughout the Project there will be ongoing engagement with stakeholders to discuss all options.</p>
<p><b>Addressing noise pollution from current bridge in the design of the new bridge</b></p>	<p>Vehicle travel on the current steel bridge deck create a lot of noise and impacts the enjoyment of tour boat clients and nearby outdoor events. Interest in determining if the new structure will address the noise issue.</p>	<p>Croisières Outaouais Ottawa Rowing Club Transport Action Canada</p>	<p>The noise pollution is planned to be factored into the design of the new bridge. The new bridge is anticipated to have a solid deck that will contribute to reducing the noise from vehicular traffic.</p>

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
<b>Concerns related to the Loss of Heritage</b>			
<b>Loss of Heritage</b>	<p>Loss of the current bridge which represents a historically significant landmark in the Capital is a concern.</p> <p>Concerns about preserving the heritage characteristics of the bridge.</p> <p>Consider keeping some of the current architectural elements in the new bridge design.</p>	<p>Transport Action Canada</p> <p>Chateau Laurier</p>	<p>The possibility of preserving some materials of the existing bridge is being assessed. Throughout the Project there will be ongoing engagement with the Canada Science and Technology Museum and the general public to explore options and ideas on how to protect the heritage of the bridge.</p> <p>Given the importance of the Alexandra Bridge's iconic heritage assets and impact of design, PSPC is working with the Royal Architectural Institute of Canada (RAIC) to establish a peer review panel, which will be engaged to provide independent advice to enable an appropriate response to the requirements for the preservation of heritage elements in the new build.</p>
<b>Concerns related to Navigation</b>			
<b>Access to mooring/docking facilities</b>	<p>Operations rely on access to docking spaces on both sides of the river. Docking must have sufficient water depth to accommodate larger boats.</p> <p>Operation of tourism business rely on the use of several boat ramps including the one in Jacques-Cartier Park.</p>	<p>Capital Cruises</p> <p>Passenger &amp; Commercial Vessel Association</p> <p>Croisières Outaouais</p> <p>Lady Dive Bus Tour</p>	<p>Opportunities for installation of a temporary wharf that can meet all the needs for stakeholders who operate or rely on the current wharf are being explored.</p>
<b>Access to the navigation routes under the bridge</b>	<p>Access to travel in the designated channel underneath the Alexandra Bridge is important to provide travel to important viewpoints such as Parliament Hill and</p>	<p>Capital Cruises</p> <p>Passenger &amp; Commercial Vessel Association</p>	<p>Concerns regarding public safety are shared and noted to be factored into the planning and construction considerations. Temporary interruptions and closures will be well coordinated in advance with the various</p>



Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
	<p>other sites of national symbols. Concerns that construction over the main water channel may prevent safe passage under the bridge.</p> <p>Channel marking and other navigation aids will be essential to ensuring safety of boaters during construction, particularly if the channel is temporarily relocated (travel in the dark or early morning)</p>	<p>Croisières Outaouais</p> <p>Lady Dive Tours</p> <p>Au feel de l'eau</p> <p>Ottawa Rowing Club</p>	<p>stakeholders involved particularly during the high season to reduce potential impacts to businesses.</p> <p>Noted for planning purposes – the high season for tourism operations range from late March or early April to late November or early December depending on the weather conditions and client interest.</p> <p>Similar to road access changes, a strategic communications plan will be developed to ensure that the changes in navigation channels are communicated to river users and accompanied by the appropriate signage and markers.</p>
<p><b>Access to supporting infrastructure for tourism boats</b></p>	<p>Continued access to wharfs to pick up clients is important for tour operators. Continued access to the wharf in Jacques-Cartier Park and the dock at the Rideau Canal are needed to pick up clients.</p> <p>Facilities need to provide access to several support services such as electricity, water, pump out station as well ticketing and guest reception areas. Parking for guests would be required.</p>	<p>Capital Cruises</p> <p>Passenger &amp; Commercial Vessel Association</p>	<p>Noted for planning purposes. Supporting infrastructure will be considered as part of the development of temporary works, particularly in Jacques-Cartier Park.</p> <p>Need for parking is noted and will be considered as part of development of the temporary works.</p>
<p><b>Improvements to the river basin as a whole, that would enhance the</b></p>	<p>The cross-sectional area of the water flow underneath the bridge and the bottom contours of the riverbed affects the</p>	<p>Ottawa Rowing Club</p>	<p>Noted for consideration during the design process and in the design of alternate navigation channels during the construction period.</p>

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
<b>experience on the water</b>	surface river turbulence under the bridge. Smooth current is better than turbulent current, from a safety and utility perspective for small watercrafts.		
<b>Opportunities to contribute to the development of viable mitigation strategies that utilize businesses operating in the area</b>	Boat operators may have knowledge or essential equipment (such as passenger boats) that can contribute to the development of mitigation strategies.	Croisières Outaouais  Ottawa Rowing Club  Au feel de l'eau	Noted for future conversations with stakeholders as the Project is better defined.
<b>Concerns related to the design of the new bridge</b>			
<b>Use this project to enhance connectivity in the neighbourhoods</b>	There currently is a missing link along the south shore (National Gallery cuts off Lady Grey Dr.) for active transportation users. Would love to see that link improved - a connection to Kiweki Point (formerly named Nepean Point).  On the north shore – nicer connection so that active transportation users do not have to traverse the road network to get back down to the river.	Global Centre for Pluralism  Ottawa Rowing Club  Tavern on the Hill  Royal Canadian Mint	In conjunction with the Alexandra Bridge Project, the NCC has been undertaking the Adjacent Impacted Land study along with other planning initiatives to look for opportunities for that connection.  The Planning and Design Principles provide direction for the new bridge. Of note, improvements in public access to the shorelines through pathway improvements for pedestrians and cyclists around the new bridge.
<b>Highlight the importance of active modes of transportation and public transportation on the new bridge</b>	Would love to see a prioritization of active modes of transportation and public transportation. Concern regarding increased vehicular traffic.	Global Centre for Pluralism  Transport Action Canada  Brigil	The focus for the design of the new bridge is on improving the facilities for active transportation users. The vision for the new bridge is to have vehicular lanes that can be converted to public transit in the future and a separation of cyclists and pedestrians.

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
<b>Importance of the bridge as a destination not only a transportation link</b>	A lookout point on the bridge for pedestrians that provides a destination or event space.	Global Centre for Pluralism  Tavern on the Hill  Brigil	The addition of observation points or seating areas where people can sit and contemplate the view is also part of the conceptual design. The new design will seek to improve the over all experience for the active transportation users.
<b>Improvements to the bridge that would enhance the river experience, e.g., attachment on the piers to set up start docks for rowers.</b>	The bridge is used as a start line for races. Ability to set up temporary docks would be helpful.	Ottawa Rowing Club	Noted for consideration during the design process.
<b>Improvements to the safety features of the bridge.</b>	Consider the safety of the bridge users. Concerned about the current safety measures on bridge and would like to see heightened measures in the new design to limit the fatalities.		The Planning and Design Principles provide direction for the new bridge. Priority must be given to the comfort, safety, and well-being of active mobility users.
<b>Concerns related to business and operational impacts during the bridge construction</b>			
<b>Impacts of construction on future development projects</b>	Consider how the construction and staging areas will impact future development projects, such as land encroachment. Encourage information sharing between different levels of government and transit authorities for consideration in future development planning.	Brigil	The IPT will work in collaboration with other levels of government and regional partners (e.g., the cities of Ottawa and Gatineau, Ontario and Quebec transportation ministries and public transit authorities) to put in place broader access to public transportation and to develop traffic management and communication plans, including mitigating heavy truck traffic in anticipation of impacts related to traffic volumes. Detours will seek to minimize disturbance to the public, as much as possible.

Area of concern or interest	Details of impact/enhancement	Raised by	Integrated Project Team's response
<b>Impacts of electrical grid interruptions due to construction</b>	Considerations for potential impacts on business operations caused by planned interruptions to electricity.	Royal Canadian Mint	The IPT will continue to engage with affected stakeholders and the public, in a timely manner, to ensure that concerns are addressed as part of the efforts to minimize the disruptions to businesses and the Project schedule. The IPT is dedicated to fostering a no-surprise environment for affected businesses.

**4.5.5 Consultation1B: mail drop and survey – Fall 2021**

In addition to meetings with stakeholders, a 1 pager was mailed to approximately 23, 000 residents in the vicinity of L’ Île de Hull, Lower town and Sandy hill, which provided general information about the Alexandra Bridge Replacement Project, its stages and timelines as well as potential impacts along with mitigation measures.

A survey also formed part of this consultation phase and residents were invited to participate from November 24 to December 12, 2021, via the NCC website.

More than 1,800 people took part in the engagement process. Input will inform the initial phase of the impact assessment process, as well as the next steps in the planning and design stages. A summary report will be created following this round of consultation, with a section that showcases how the comments raised are being or will be addressed.

As of early December, approximately 759 surveys were completed, a total of 1846 responses were recorded. Participants were asked to self-identify - age, gender, language, and other(s) to ensure that the comments, questions and concerns gathered and documented represent those from a diverse population.

The demographics of the various characteristics of the survey population included:

- Age
- Gender
- Ethnicity
- Language
- Employment
- Salary
- Disability

**Table 4-11: Summary of the demographics of survey participants.**

Demographic Characteristic		Representation in percentage (%)
<b>Age</b>  (Most respondents were 65 years of age or over. While only one respondent was under the age of 18, representing the lowest represented age category.)	Under 18	0.6
	18-24	2.5
	25-34	16
	35-44	16.6
	45-54	17.4
	55-64	17.2
	65+	25
	Prefer not to share	4.7
<b>Gender Identity</b>  (Of the respondents who identified as gender diverse 3 were non-binary, 1 was two-spirited, 1 was Ambigender, while two preferred not to disclose their gender identity.)	Man	57.2
	Woman	34.4
	Gender Diverse	1.4
	Prefer not to share	7
<b>Visible Minorities</b>	Non-Visible Minority	83
	Prefer not to say	9
	Visible Minorities	8
<b>Indigenous</b>	Non-Indigenous	89
	Prefer not to share	8
	<b>Indigenous</b>	<b>3</b>
	Métis	55
	First Nations	25
	Prefer not to share	20
<b>Language</b>	English	50
	French	40
	Prefer not to share	4
	Other	6

In addition to the demographic characteristics highlighted above, participants also identified education level, employment status, income as well as disability. A summary report, including survey data and takeaways from stakeholder meetings will be published in the Winter of 2022 and available to the public on the NCC's website.

Participants were also asked to identify whether they were part of the general public or an organization(s). Most participants (98%) identified as members of the public, with the remaining (2%) identified as an organization.

All participants were asked to rank topics of interest (e.g., cultural heritage) as part of the survey and answer a series of questions as it relates to:

- Anticipated benefits of the Bridge replacement
- Potential disruptions created by the Project
- Proposed mitigation measures

The tables below highlight and rank topic of interests that the participants identified.

**Table 4-12: Ranking of the topic of interest/concerns raised by survey participants who identified as members of the public.**

Topic of Interest	Ranking
Cultural Heritage	1
Transportation	2
Active Mobility	3
Construction	4
Sustainable development	5
History of the Bridge	6
Environmental concerns	7
Impact Assessment process	8

**Table 4-13: Ranking of the topic of interest/concerns raised by survey participants who identified as an organization.**

Topic of Interest	Ranking
Active mobility	1
Environmental concerns	2
Impact Assessment process	3
Construction	4
Transportation	5
History of the Bridge	6
Cultural heritage	7
Sustainable development	8

As part of the series of questions within the survey, participants were asked to identify opportunities or anticipated benefits in relation to the Project. The most frequently noted key opportunities /anticipated benefits included:

- Ensuring the safety of all travelers
- Improve existing structure to beautify the surrounding landscaping
- Provide better access for pedestrians and cyclists (increase active mobility)
- Additional traffic flow between Ottawa and Gatineau
- Adaptability to modern modes of transportation

As mentioned above, analysis of the data, responses and comments which derive from the meetings with stakeholders and the fall 2021 survey were published in Winter of 2022 and used to continue to inform stages of the Project. The summary is accessible via the NCC's website.

The IPT remains committed to engaging with the public and stakeholders. Future plans for engagement are highlighted in the section below.

## 4.6 Plans for Future Engagement

Public engagement for the Project will include four (4) additional rounds of public consultation centered on design and construction milestones: conceptual design, functional design, preliminary design, detail design, and construction plans. These future consultations will also provide opportunities for the public to weigh in on potential mitigation and enhancement measures as the new bridge's design and the likely impacts of the Project, as a whole, become better defined. An overview of the objectives, activities, tools, and timelines for these future stages of public consultation is provided in Table 4-15.

In addition to formal stages of consultation articulated around Project milestones, the IPT will continue to engage with stakeholder groups and members of the public as the need arises throughout the Project life cycle.

### 4.6.1 Ongoing, Inclusive Engagement

Building on the momentum of the online public consultation and meetings with stakeholder groups held during the Project's first stage of public consultation, the NCC and PSPC are actively pursuing new opportunities for dialogue with a broad range of stakeholders and members of the public, including but not limited to heritage coalitions, disability support organizations and accessibility advocacy groups, as well as adjacent landowners. An exhaustive list of those who have been invited to participate in public consultations is identified in Appendix C.

The IPT is committed to remaining responsive to the needs of stakeholder groups and members of the public for deeper and more frequent engagement between and throughout the different stages of public consultation. In keeping with this commitment, members of the Project team continue to meet with stakeholder groups and individuals who have expressed interest in following up on certain issues addressed during the first stages of public consultation. This includes heritage organizations with specific

concerns about the bridge’s replacement, and members of the public who want to share their ideas for the new bridge’s design.

With the first stage of formal consultation now completed, the IPT is also taking stock of who has been “at the table” so far and assessing how we can make more room for those whose voices have not yet been heard. For example, after the first stage of the consultation process, a need for more thorough engagement with stakeholders adjacent to the proposed Project site was identified and carried out during the summer 2021. Consultations with the Canadian Museum of History and the National Gallery of Canada were held as part of this stage. Other stakeholders including, for example, the NCC tenants at the Hull Wharf have also been identified as requiring a more detailed exchange.

In addition, based on feedback from the NCC’s Advisory Committee on Universal Accessibility (ACUA), the IPT is in the process of planning meetings with disability advocacy groups to ensure that the perspectives and experiences of persons with disabilities are better understood and considered. The IPT are also creating opportunities for institutions and organizations located near the Alexandra Bridge, or whose membership or clients regularly use the bridge, to have more in-depth and frequent conversations with us about their specific needs and concerns in relations to the Project. Among these groups are local community associations, embassies, homeless shelters, hotels, sports and recreation clubs, and cultural institutions.

Moving forward, the NCC will allow participants to self-identify and continue to offer diverse approaches to facilitate participation in public consultation. Future consultations could include virtual town halls, surveys, and face-to-face consultation, if suitable. Efforts to ensure that all consultation is inclusive and considers diverse perspectives as part of the Project’s public engagement process will be ongoing. Such efforts are further outlined in the Table 4-14.





**Table 4-14: Plans for future public engagement**

What we plan to do	How we intend to do it
<p><b>Assess whether we are hearing from a representative cross-section of the local population and identify gaps in our outreach.</b></p> <p><b>Question our assumptions and biases about who is likely to be affected by this Project, and how they are likely to experience its effects.</b></p>	<ul style="list-style-type: none"> <li>• Compare the demographic makeup of our existing interlocutors to data on the demographic composition of the National Capital Region to identify gaps.</li> <li>• Be transparent about our outreach and engagement process. Invite scrutiny and feedback.</li> <li>• Make the question: “Who might we have left out of the conversation?” part of our engagement with new and existing stakeholder groups.</li> </ul>
<p><b>Reach out to those whose voices have not yet been heard and make meaningful efforts to remove barriers to their participation in the public engagement process.</b></p>	<ul style="list-style-type: none"> <li>• Develop outreach methods tailored to groups from whom we have not yet heard.</li> <li>• Make the question: “How would you prefer to be engaged?” a central part of public engagement strategies.</li> <li>• Adapt the means and logistics of engagement initiatives to the needs expressed by stakeholder groups and members of the public.</li> </ul>
<p><b>Create conditions in which public engagement participants can fully express themselves.</b></p>	<ul style="list-style-type: none"> <li>• Consider the need to hold separate consultation sessions to create a safe space where participants can raise their concerns and share their aspirations for the Project comfortably and without fear of exclusion or marginalization.</li> <li>• In online engagement initiatives, consistently include open-ended questions that allow participants to freely articulate their thoughts about the Project.</li> </ul>

## 4.6.2 Schedule of Past and Proposed Public Engagement Activities

Table 4-15 provides an overview of plans for public engagement during each phase of the Impact Assessment Process.

**Table 4-15: Overview of objectives and timelines for public engagement**

Phases(s)/ Stages	Public engagement objectives	Expected activities	Public participation tools	Proposed Timelines
<b>Pre-Planning</b>	<p>Build relationships with key stakeholder groups on a flexible basis during and between formal consultation events</p> <p>Provide members of the public with an opportunity to:</p> <ul style="list-style-type: none"> <li>• Share their thoughts and concerns about how they might be affected by the Project.</li> <li>• Share updates on the Project (e.g., timelines for alignment decision).</li> <li>• Propose additional ideas to minimize any adverse effects and identify other enhance any benefits.</li> <li>• Propose ideas as to how the history and built heritage of the Alexandra Bridge should be celebrated after its replacement.</li> </ul>	<p>Meetings and correspondence with stakeholder groups</p> <p>Online public consultation</p>	<p>Microsoft Teams meetings</p> <p>Phone calls</p> <p>Social media</p> <p>Email</p> <p>Advertising Project</p> <p>Webpage Survey</p>	<p>commenced November 2020 to 2022</p>

Phases(s)/ Stages	Public engagement objectives	Expected activities	Public participation tools	Proposed Timelines
<b>Planning</b>  <b>Impact Statement / Concept Design</b>	Provide members of the public with an opportunity to: <ul style="list-style-type: none"> <li>• Share their thoughts and concerns about how they might be affected by the Project.</li> <li>• Share updates on the Project (e.g., timelines for alignment decision).</li> <li>• Propose additional ideas to minimize any adverse effects and identify other enhance any benefits.</li> <li>• Propose ideas as to how the history and built heritage of the Alexandra Bridge should be celebrated after its replacement.</li> <li>• Learn about the conceptual design options</li> <li>• Provide feedback on conceptual design options</li> </ul>	Meetings with stakeholder groups	Mail drop – adjacent landowners  Microsoft Teams meetings  Email  Advertising	2023
<b>Impact Assessment / Functional Design</b>	Provide members of the public with an opportunity to: <ul style="list-style-type: none"> <li>• Learn about the preliminary design</li> <li>• Provide feedback on the preliminary design</li> </ul>	Online public consultation	Project webpage Online survey Social media Email Advertising	2024
	Continue engaging with key stakeholder groups on a flexible basis during and between formal consultation events	Meetings with stakeholder groups	Microsoft Teams meetings Social media Email Advertising	2024

Phases(s)/ Stages	Public engagement objectives	Expected activities	Public participation tools	Proposed Timelines
<b>Decision-making / Preliminary Design</b>	Provide members of the public with an opportunity to: <ul style="list-style-type: none"> <li>Learn about the final design</li> <li>Provide feedback on the final design</li> </ul>	Online public consultation	Project webpage Online survey Social media Email Advertising	2025
	Continue engaging with key stakeholder groups on a flexible basis during and between formal consultation events	Meetings and correspondence with stakeholder groups	Microsoft Teams meetings Social media Email Advertising	2025
<b>Post-Decision /Detailed Design</b>  <b>Deconstruction and Construction of new bridge</b>  <b>Operation and Maintenance</b>	Continue engaging with key stakeholder groups on a flexible basis during and between formal consultation events	Meetings and correspondence with stakeholder groups	Microsoft Teams meetings Email Phone calls	Winter 2025 to fall 2032



## 5 SUMMARY OF ENGAGEMENT WITH INDIGENOUS COMMUNITIES

The following section outlines the Crown's duty to consult, provides an overview and a summary of engagement (to date) and consultation with Indigenous communities, communities and organizations for the Project. Also included is the plan for future engagement and initiatives which will occur throughout the life cycle of the Project.

Other sections of this document contain key considerations and information pertaining to Indigenous engagement and participation in the Project, including:

- Section 14.4 – Descriptions of each Indigenous community and its proximity to the Project
- Section 19 – Potential environmental impacts as well the health, social and economic conditions of Indigenous communities . The Section provides details of engagement with each specific Indigenous communities, including Initial comments on issues and concerns, requirements of the Indigenous communities for engagement, and a record of procedural and substantive engagement with each Indigenous community
- [Appendix D](#) – provides a record of engagement with Indigenous communities
- [Appendix E](#) – Provides an overview of land claims noted for reference
- Figure 14-8 provides a map highlighting the location of each Indigenous community and their distance to the Project

PSPC and the NCC understand that the Project area is within the traditional territory of the Algonquin Nation. The Ottawa River is an area of special significance for Indigenous Peoples who have relied on this natural highway for generations for the provision of food and water, for transport throughout traditional territories, and for commerce with others passing through the area. Today, the Ottawa River continues to be of great importance as Indigenous Peoples take great strength from the significance of the river and the connections it provides to past, current and future generations.

The IPT is aware of the importance of the river to Indigenous peoples and is committed to undertaking planning, consultation and execution of the project in a way that enhances aspects of its environment while preventing harm or detracting from peoples' experience.

The engagement of Indigenous peoples is key to the project. Indigenous knowledge will be sought out, respected and honoured and will be given the same consideration as scientific knowledge brought forward by the IPT and its external experts. The Indigenous knowledge may include detailed historical accounts of the Ottawa river and its environs, fish and animal species, plants, shoreline conditions and water quality. Knowledge of how previous construction projects on or near the Ottawa river affected these components and potentially affected the health and well-being of Indigenous peoples will also be sought. The knowledge will be integrated to further the understanding of potential impacts from the Project and how these may lead to impacts to Indigenous communities. In addition, Indigenous knowledge will be considered, as appropriate, into the design and construction of the replacement bridge and improvements in the Project area.

The fundamental purpose of Indigenous engagement for the Project is to:

- ensure Indigenous communities have sufficient information to understand the Project, provide their perspectives, voice their issues and concerns
- provide an avenue for collaboration with the IPT to ensure the issues and concerns raised are addressed through mitigation measures
- maximize benefits accruing to Indigenous people from the Project
- enhance the long-term relationship between Indigenous peoples and the Crown, for this and all subsequent projects.

Meaningful engagement and consultation involve reaching a shared understanding of the potential impacts of the Project on:

- Physical and cultural heritage
- The current use of lands and resources for traditional purposes
- Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance
- The health, social or economic conditions of Indigenous communities

The engagement activities will provide opportunities for each Indigenous community and organization to:

- review Project-specific details
- identify valued components
- participate in studies, conduct their own studies, gather and provide Indigenous knowledge as appropriate
- identify issues and concerns, recommend enhancements or mitigation measures, and
- increase opportunities for economic benefits to be obtained by Indigenous communities and businesses as a result of the Project.

The IPT will seek advice and guidance from Indigenous communities to ensure that consideration is given to sub-populations within communities, as they may experience the project differently. For instance, the IPT will seek meaningful ways to gather views from Women, Youth, Elders and other sub-groups as appropriate.

The small size of many of the communities and the personal nature of the issues require special considerations to gather and understand local perspectives and to protect sensitive information. Details will emerge as more engagement occurs during all stages of the Project. PSPC and the NCC will work with each Indigenous community and organization to identify those who may experience the Project differently and provide opportunities for diverse sub-groups to be heard. The focus will be to understand how the Project might affect diverse groups of people differently, provide opportunities for a more equitable distribution of the Project's benefits and ensure that impacts are understood and effectively mitigated.

Economic benefits from the Project will flow mainly from participation by Indigenous people and businesses in the contracting and work opportunities stemming from every stage of the Project, from



planning through design, construction and the long-term maintenance and operations of the replacement bridge.

Given the long timeframe of the project, with deconstruction activities scheduled to start in 2028 and replacement to be completed in 2032, there are many opportunities to develop comprehensive plans that focuses on providing benefit to Indigenous people for years to come. The initial collaboration will focus on identifying the capacities and the ambitions of Indigenous peoples and businesses compared to the work that will occur in coming years. Training plans will be developed by Indigenous communities with financial support from the IPT and with access to other federal and provincial training initiatives. Interim procurement opportunities on other crossings projects in the National Capital Region, where there are presently five bridges in place, will give experience to Indigenous communities and workers and help identify obstacles and barriers to their participation so that access to work and business on the replacement bridge will be as wide and varied as possible.

## 5.1 Commitment to Reconciliation

Fulfilling the government's commitment to reconciliation requires a renewed, nation-to-nation, government-to-government relationship based on recognition of rights, respect, co-operation, and partnership as the foundation for transformative change.

In keeping with the government of Canada's commitment to strengthening partnerships and advancing reconciliation efforts, the Department of Justice (GOC, 2018) has articulated the following ten principles:

1. The Government of Canada recognizes that all relations with Indigenous peoples need to be based on the recognition and implementation of their right to self-determination, including the inherent right of self-government.
2. The Government of Canada recognizes that reconciliation is a fundamental purpose of section 35 of the *Constitution Act, 1982*.
3. The Government of Canada recognizes that the honour of the Crown guides the conduct of the Crown in all of its dealings with Indigenous peoples.
4. The Government of Canada recognizes that Indigenous self-government is part of Canada's evolving system of cooperative federalism and distinct orders of government.
5. The Government of Canada recognizes that treaties, agreements, and other constructive arrangements between Indigenous peoples and the Crown have been and are intended to be acts of reconciliation based on mutual recognition and respect.
6. The Government of Canada recognizes that meaningful engagement with Indigenous peoples aims to secure their free, prior, and informed consent when Canada proposes to take actions which impact them and their rights, including their lands, territories and resources.



7. The Government of Canada recognizes that respecting and implementing rights is essential and that any infringement of section 35 rights must by law meet a high threshold of justification which includes Indigenous perspectives and satisfies the Crown's fiduciary obligations.

8. The Government of Canada recognizes that reconciliation and self-government require a renewed fiscal relationship, developed in collaboration with Indigenous nations, that promotes a mutually supportive climate for economic partnership and resource development.

9. The Government of Canada recognizes that reconciliation is an ongoing process that occurs in the context of evolving Indigenous-Crown relationships.

10. The Government of Canada recognizes that a distinctions-based approach is needed to ensure that the unique rights, interests and circumstances of the First Nations, the Métis Nation and Inuit are acknowledged, affirmed, and implemented.

Indigenous Peoples have a long history in the NCR and continue to be a defining aspect of the Capital. The IPT continues to seek ways to build strong relations with local Indigenous leaders and peoples, focusing on ensuring that their interests are truly reflected in the numerous Projects and initiatives being undertaken across the region.

As the department responsible for the Government of Canada's procurement services, PSPC has a pivotal role to play in rebuilding relationships between the Crown and Indigenous communities, including:

- Creating more opportunities for Indigenous businesses to succeed and grow by ensuring a minimum of 5 per cent of the total value of federal contracts are held by Indigenous businesses\*
- Helping to advance self-determination, close socio-economic gaps and eliminate systemic barriers faced by Indigenous peoples
- Ensuring Indigenous peoples are represented in leadership positions within PSPC
- A commitment to skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism for PSPC employees.

\* Each contract awarded at every stage of the Project will include a requirement for private sector bidders to develop an Indigenous Participation Plan, detailing how the winning bidder will address human resources (hiring, support and retention), skills development, subcontracting, and other innovative measures that will support participation by Indigenous people and businesses.



Specific commitments to reconciliation linked to the Truth and Reconciliation Commission's (TRC) Calls to Actions and the National Inquiry into Missing and Murdered Indigenous Women (MMIW) and Girls' Calls for Justice include:

- TRC # 43 and 44 – engagement activities will ensure respect of Indigenous rights
- TRC #92 – requiring contractors to increase Indigenous economic participation
- MMIW 4.2 – education and training plans, and improved hiring, support and retention practices required in the Indigenous Benefits Plans will improve equity in economic opportunities.

Barriers to economic participation of women will be identified and addressed.

## 5.2 Duty to Consult with Indigenous Communities

The Crown has a duty to consult aboriginal peoples when it acts in a manner that may adversely affect aboriginal or treaty rights guaranteed by section 35 of the *Constitution Act, 1982*. The existence of the rights need not be proven but only credibly asserted to trigger the duty.

Three (3) factors required to trigger the common law duty to consult are evident in the Project:

1. There is a proposed Crown conduct.
2. The proposed Crown conduct could potentially have an adverse impact on potential or established Aboriginal or Treaty rights.
3. There are potential or established Aboriginal or Treaty rights in the area.

The IPT, as Crown entities, have a Duty to Consult with Indigenous communities prior to the Impact Assessment (IA) process formally commencing and also after the decision, should an IA be required for the Project. To this end, the IPT initiated engagement early in the planning process, in March 2020.

## 5.3 Indigenous Communities Potentially Impacted

The identification of potentially impacted Indigenous communities was determined by considering:

- The identification by Indigenous communities of their traditional territories that intersect or overlap with the watershed of the Ottawa River
- Whether the Project could have potential impacts on physical and cultural heritage, current land use and resources for traditional purposes
- Whether the Project could potentially create changes to health, social or economic conditions of Indigenous communities .

Information sources included the Aboriginal and Treaty Rights Information System (ATRIS), websites of Indigenous communities and organizations, the record of decisions of the Supreme Court of Canada, records from the Governments of Ontario and Quebec concerning land claims and modern treaty negotiations as well as recent experiences with Indigenous engagement by PSPC and the NCC concerning other federal Projects in the NCR and within the traditional territories of the Indigenous peoples.

After considering all these sources, the following Indigenous communities were identified for engagement and listed below in alphabetical order:

- Algonquin Anishinabeg Nation Tribal Council (AANTC)
- Algonquin Nation Secretariat
- Algonquins of Ontario (AOO), including the member communities of:
  - Antoine
  - Bonnechere
  - Greater Golden Lake
  - Kijicho Manito Madaouskarini (Bancroft)
  - Mattawa/North Bay
  - Ottawa
  - Shabot Obaadjiwan (Sharbot Lake)
  - Snimikobi (Ardoch)
  - Whitney and Area
- Algonquins of Pikwakanagan First Nation
- Kebaowek First Nation
- Kitigan Zibi Anishinabeg First Nation
- La Nation Anishinabe du Lac Simon
- La Nation Huronne-Wendat
- Le Conseil de la Première Nation Abitibiwinni
- Le Conseil des Anicinapek de Kitcisakik
- Long Point First Nation
- Métis Nation of Ontario
- The Algonquins of Barrière Lake
- The Mohawk Council of Akwesasne
- The Mohawk Council of Kahnawake
- The Mohawk Council of Kanesatake
- Timiskaming First Nation
- Wahgoshig First Nation
- Wolf Lake First Nation

## 5.4 Financial Support for Indigenous Engagement

### 5.4.1 The Crossings Program of Work

Indigenous engagement and consultation will be done specifically for the Project. At the same time, PSPC is engaging with the same Indigenous communities and organizations on other bridge-related Projects in the NCR and further upstream of the Ottawa River that are within the traditional territories of the communities and organizations described above. The other bridges are at various stages in their lifespans and are subject to frequent needs for repair and maintenance. There is also preliminary consideration of a sixth crossing in the NCR. PSPC and the NCC refer to the collective activities as the Crossings Program of Work and see the engagement activities as complementary to the engagement and consultation being done for the Project. PSPC and the NCC will consider conducting specific engagement and consultation activities in relation to these projects as appropriate.

## 5.4.2 Financial Support for the Project

Funding is being made available by the IPT to ensure the Indigenous communities and organizations have the capacity to participate throughout the Project. Budget funds have been allocated over a multi-year period. The IPT is working with Indigenous communities to develop five (5)- year budgets and work plans that will allow Indigenous communities to plan ahead and make commitments to staff that will ensure continuity of participation. It is understood that the funding and work plans are not final once approved and will be revisited as the Project evolves.

The activities eligible for funding are extensive and not prescribed by list, giving the Indigenous communities flexibility to determine what they need to participate. Examples of activities identified to date by Indigenous communities include:

- Increasing staff capacity (recruiting), including hiring external consulting expertise
- Training staff and community volunteers, and
- Purchasing equipment to improve the ability to communicate with community members, attending meetings with community members, and undertaking studies of importance to the communities.

Several Indigenous communities identified a lack of capacity and resources which created a barrier to their ability to review Project documents and create a multi-year work plan and budget. Accordingly, PSPC is making available initial seed funding of up to \$50,000 per community to allow them, in collaboration with the IPT, to create Project agreements, access resources (internal or external) to review Project documents, and prepare multi-year work plans and budgets. Once the work plans and budgets are devised, the IPT will make additional funds available to each Indigenous community according to their identified needs.

PSPC does not have financial authority to enter into contribution agreements directly with Indigenous communities and organizations. Rather, PSPC will be using an existing relationship with Indigenous Services Canada (ISC) to flow funding through the Strategic Partnerships Initiative (SPI). The SPI process, which is used by several Government of Canada departments and agencies, allows PSPC to transfer funds to ISC, which uses its program authority to then execute contribution agreements with the Indigenous communities and organizations.

The amount of funding to be made available to each community and organization will be determined through a collaborative planning process whereby the Indigenous parties will identify their funding requirements.

## 5.5 Procedural Engagement with Indigenous Communities and Organizations

Initial correspondence was sent to communities between March and August 2020. The letters sent to le Conseil de la Première Nation Abitibiwinni, La Nation Anishnabe du Lac Simon, and La Communauté Anicinape de Kitcisakik were in French. The letters to the other Indigenous communities and organizations were in English.

The letters to the Indigenous communities and organizations requested opportunities to meet or otherwise communicate to understand their requirements for engagement, including:

- How they would like to be engaged and consulted
- What information they will need about the proposed Project
- How they would like to share Indigenous knowledge
- Initial issues and concerns they may have about the Project
- Their views on possible economic benefits of the Project and
- Opportunities for employment and contracting for Indigenous businesses and workers.

Follow up letters were sent by the IPT to all Indigenous communities , communities and organizations in November 2020 for the formal commencement of engagement. The letters reaffirmed the interests of the IPT to understand the communities' requirements for engagement and confirm the availability of funding to support engagement requirements of the communities and organizations.

Draft versions of the IPD were shared with Indigenous communities on April 28, 2021 and again on January 20, 2022 prior to submission of the document to the Impact Assessment Agency of Canada. Sharing the draft in this way was suggested to the IPT by Indigenous communities , who had expressed concern about their ability to review the document and provide comments within the timelines prescribed by the Impact Assessment Act.

The IPT hosted several meetings, mostly through video conferencing, with Indigenous communities to introduce the Project, describe the impact assessment process, reflect on input and knowledge provided by Indigenous communities , emphasize the availability of funding to support engagement activities, and listen and acknowledge to the concerns voiced by the Indigenous communities .

The presentations and discussions focused on:

- Information from the communities and organizations about their situations and interests in the Project
- Background on the current Alexandra Bridge including its location and the need to replace it
- Project timelines
- The IPT's initial overview of potential impacts
- Examples of mitigation and enhancement measures
- Anticipated studies to be conducted for the Impact Assessment
- Discussion of the Indigenous views of potential effects
- Availability of funding to support Indigenous participation in the process
- How the Indigenous communities or organizations wish to be engaged and
- Indigenous community or organization's views of appropriate next steps.

This early engagement with Indigenous communities and organizations has provided initial considerations of how Project impacts and benefits affect people differently. For example, the engagement summary of social and economic impacts with the Algonquins of Pikwakanagan First Nation describes barriers to employment related to the lack of access to training and education, the cost and scarcity of childcare, lack of support on job sites for Indigenous people, and the lack of transportation to job sites. The engagement summary of social and economic impacts with the Kebaowek First Nation describes the need for additional support for young people interested in education and careers in science, technology, and engineering.

Table 5-1 summarizes the results of engagement to date with each Indigenous community, including what concerns and issues were expressed, how the IPT is addressing the concerns, and what collaborations will occur going forward to ensure Indigenous rights are protected and concerns are addressed.



**Table 5-1: Summary of the Key Issues Raised by Indigenous Communities**

Indigenous Community	Area of Concern or Interest	Integrated Project Team’s (IPT) response
<b>Algonquin Anishinabeg Nation Tribal Council</b>	Need for financial support for engagement activities and to support members to share in economic benefits.	Funding has been provided by PSPC for two consultation and procurement positions within the Algonquin Anishinabeg Nation Tribal Council. As engagement activities accelerate, the IPT will invite the Algonquin Anishinabeg Nation Tribal Council to consider a work plan and budget for expanded activities.
<b>Algonquin Nation Secretariat</b>	No issues have been identified yet.	The IPT will continue to communicate with the Nation.
<b>Algonquins of Ontario</b>	Damage to spawning grounds and fish habitat, harming fish populations throughout the Ottawa River watershed.	<p>The bridge will be designed and constructed to not impede or restrict the movement of aquatic species throughout the project area.</p> <p>Through the implementation of habitat creation, restoration, and other offsetting measures, impacts from this Project on fish and fish habitat to achieve net environmental benefits may be positive over the long-term.</p>
	Need for fish habitat restoration and monitoring after completion of construction.	<p>The effectiveness of mitigation measures will be monitored to ensure that there is no long-term harm to fish and other aquatic species.</p> <p>Areas affected by construction that can be rehabilitated will be restored.</p> <p>Habitat creation, restoration and other offsetting measures will be considered to achieve positive net environmental benefits over the long-term.</p>

Indigenous Community	Area of Concern or Interest	Integrated Project Team's (IPT) response
	Need for financial support for AOO engagement activities and environmental monitoring.	AOO has developed a five-year work plan and budget that has been approved by the IPT.
<b>Algonquins of Pikwakanagan First Nation</b>	Participation in Project studies: community will conduct its own studies and will determine later how it will participate in studies led by the IPT.	<p>Funding has been provided by the IPT according to a work plan and budget provided by Algonquins of Pikwakanagan First Nation. The community is interested in conducting some studies on its own and participating with the IPT on other studies. Draft Terms of Reference for Project studies are being shared in advance by the IPT to obtain community input and help it determine how it wishes to participate.</p> <p>Additional work items identified by Algonquins of Pikwakanagan First Nation during the Project development will be discussed by a joint working group.</p>
	Participation/requirement to guide and develop environmental management and restoration plans, including environmental enhancements.	Early and continuous engagement will occur with all potentially impacted Indigenous communities. Indigenous knowledge will be considered along with scientific studies to create the best possible results and opportunities for shared learning.
	Protective and enhancement for wildlife, and habitat restoration plans must be developed with Indigenous involvement.	The IPT will provide opportunities for Indigenous communities to be involved in the creation of protective and enhancement wildlife and habitat restoration plans. Indigenous knowledge will be considered along with scientific studies to create the best possible results and opportunities for shared learning.



Indigenous Community	Area of Concern or Interest	Integrated Project Team's (IPT) response
	Algonquins of Pikwakanagan First Nation members and businesses must benefit from economic opportunities.	Engagement with Algonquins of Pikwakanagan First Nation is ongoing regarding procurement opportunities and the creation of Indigenous Participation Plans. Financial support has been provided by PSPC for the creation and maintenance of a skills and proficiencies inventory. The community is considering its long-term ambitions for training and development and will work with the IPT and private sector contractors, as appropriate, on achieving the goals.
<b>Kebaowek First Nation</b>	Impediments to the movement of aquatic species and damage to spawning grounds and fish habitat	The bridge will be designed and constructed to not impede or restrict the movement of aquatic species throughout the Project area.
	Need for fish habitat restoration and monitoring after completion of construction.	<p>The effectiveness of mitigation measures will be monitored to ensure that there is no long-term harm to fish and other aquatic species.</p> <p>Areas affected by construction that can be rehabilitated will be restored.</p> <p>Habitat creation, restoration and other offsetting measures will be considered to achieve positive net environmental benefits over the long-term.</p>
	Need for financial support for engagement activities and to support members to share in economic benefits.	Collaboration is underway with the First Nation and the IPT to sign a Letter of Intent that identifies an initial level of funding to commence planning, to be followed by the submission of a multi-year work plan and budget.





Indigenous Community	Area of Concern or Interest	Integrated Project Team's (IPT) response
<b>Kitigan Zibi Anishinabeg First Nation</b>	The community has yet to provide detailed comments on the IPD. Initial conversation highlighted the community's interests in water quality, fish habitat and the appropriate treatment of archaeological resources.	Meetings are occurring with senior staff to obtain comments on the Initial Project Description and to support the development of a work plan and budget.
<b>La Nation Anishnabe du Lac Simon</b>	Interest has been expressed in economic opportunities.	<p>The IPT will work with the Nation on an Indigenous Participation Plan to ensure economic opportunities are available.</p> <p>The IPT will continue to communicate with the Nation and provide funding support when requested.</p>
<b>La Nation Huronne-Wendat</b>	The Nation has stated its intention to participate in environmental studies, archaeological studies, and economic opportunities.	<p>The Nation is interested in conducting some studies on its own and participating with the IPT on other studies. Draft Terms of Reference for Project studies are being shared in advance by the IPT to obtain community input and help it determine how it wishes to participate.</p> <p>Additional work items identified by the Nation during the impact assessment will be discussed by a joint working group.</p> <p>The IPT will work with the Nation on an Indigenous Participation Plan to ensure economic opportunities are available. The Nation is the majority owner of a construction company and exploration of how it can be active on the Project will be undertaken</p>



Indigenous Community	Area of Concern or Interest	Integrated Project Team's (IPT) response
<b>Le Conseil de la Première Nation Abitibiwinni</b>	Interest has been expressed in economic opportunities and in training and development opportunities for youth.	The IPT will work with the Nation on an Indigenous Participation Plan to ensure economic opportunities are available. The Nation is the majority owner of a construction and environmental services company and exploration of how it can be active on the Project will be undertaken. The Nation will consider a long-term training and development program for consideration by the IPT.
<b>La Conseil Anicinape de Kitcisakik</b>	The quality of the environment within the Ottawa River watershed.	Habitat creation, restoration and other offsetting measures will be considered to achieve positive net environmental benefits over the long-term.
<b>Long Point First Nation</b>	No issues have been identified yet.	The IPT will continue to communicate with the Nation and provide funding support when requested.
<b>Métis Nation of Ontario</b>	No issues have been identified yet.	The IPT will continue to communicate with the Nation.
<b>The Algonquins of Barrière Lake</b>	No issues have been identified yet.	The IPT will continue to communicate with the Nation.
<b>The Mohawk Council of Akwesasne</b>	No issues have been identified yet.	The IPT will continue to communicate with the Nation.
<b>The Mohawk Council of Kahnawake</b>	No issues have been identified yet.	The IPT will continue to communicate with the Nation.
<b>The Mohawk Council of Kanesatake</b>	No issues have been identified yet.	The IPT will continue to communicate with the Nation.
<b>Timiskaming First Nation</b>	Involvement in reviewing terms of reference for Project studies	The IPT will provide the opportunities for Indigenous communities to participate in the development of terms of reference for studies.

Indigenous Community	Area of Concern or Interest	Integrated Project Team's (IPT) response
	Studies should include a cumulative effects study considering historical use of the Ottawa River and how the next seven generations will be affected.	The spatial boundaries for the cumulative assessment on valued components of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation strategies, may, in combination with others, cause a significant change now or in the future in the existing characteristics of the valued component.
<b>Wahgoshig First Nation</b>	No issues have been identified yet.	The IPT will continue to communicate with the Nation.
<b>Wolf Lake First Nation</b>	The Nation needs financial support for engagement.	Funds have been offered to support staff participation and the hiring of external experts.

### Engagement During the Pandemic

The initial communications with Indigenous communities and organizations in March 2020 coincided with measures enacted by all government levels, including Indigenous governments, to address the COVID-19 pandemic. Most Indigenous communities and organizations closed their administrative offices for an indefinite period in response to the pandemic. Addressing more pressing issues and responding to the pandemic limited opportunities for engagement.

Due to the COVID-19 lock-down orders and travel restrictions, PSPC and NCC staff could not attend in-person meetings in communities and restricted the Councils and staff of Indigenous communities and organizations from working in the same location.

Where communities had the opportunity and technical capacity to meet with PSPC and the NCC through telephone or video conferencing, engagement meetings commenced. PSPC and the NCC informed Indigenous communities and organizations that funding was available to purchase equipment to improve their communications capacity with external parties and within their communities with their own members. The Algonquins of Pikwakanagan First Nation was able to use PSPC funding to purchase equipment and technical support services to implement new ways of connecting with community members.

PSPC and NCC will continue to reach out to all Indigenous communities and organizations identified for engagement through emails and telephone to determine when engagement will occur or to receive

notification that a community/organization chooses not to be engaged at this time. Project updates and procurement activities will be shared with all communities and organizations. Should a community or organization state its readiness to proceed with engagement, all efforts will be made through contact and the provision of funding to expedite their participation.

### **Indigenous Participation in Studies**

The Project will require many studies to be undertaken, as described throughout this document. The IPT has committed to extensive Indigenous engagement in the studies, from their conception through execution and analysis. The nature of the participation will be determined by the Indigenous communities themselves, including:

- Reviewing the list of proposed Project studies and suggesting additional studies that may be useful and necessary
- Reviewing draft Terms of References for studies and commenting on the appropriateness and adequacy of the approach
- Indigenous communities leading studies with financial support from the IPT and providing the results to the IPT.
- Indigenous communities participating in studies in parallel with the work of external experts hired by the IPT, such as the various Guardians initiatives active in Indigenous communities. This will foster the two-way sharing of knowledge between scientists and Indigenous people.
- Reviewing the results of studies undertaken under the direction of the IPT and providing comments and guidance.

## **5.6 Economic Benefits – Indigenous Participation Plans**

The significant amount of contracting and employment associated with the bridge planning, construction and operations will offer many opportunities for Indigenous workers and companies to obtain economic benefits from the Project .

PSPC and the NCC will utilize an approach to creating Indigenous benefits through Indigenous Participation Plans (IPP), to leverage training opportunities, employment, sub-contracting and capacity building for Indigenous businesses and people.

PSPC will be engaging private sector contractors to plan, build and operate the bridge through formal procurement processes and legal contracts. Each bidder will be required to submit an Indigenous Participation Plan with its bid, with a clear statement of the minimum amount of Indigenous benefits that the bidder proposes to provide, expressed in dollars and as a percentage of the total contract value. There will be a number of contracting opportunities throughout the life of the Project for example, there will be different contracts issued to undertake scientific studies, to design the bridge, to remove the existing bridge and build its replacement, and to maintain the bridge. Each contract will bring an opportunity for a unique IPP.

PSPC will work with potential bidders and Indigenous communities to support collaboration between the parties for the development of IPPs, especially concerning the identification of existing community capacity and desired areas of investment for future capacity. Following the signing of contracts with the



successful bidders, PSPC will convene regular meetings with Indigenous communities and the contractor to monitor progress, address any issues or changing conditions that arise, and adjust the IPPs if necessary.

Each bidder will be required to provide information on how it will address key aspects of the IPP, including:

**Human Resources Plan** - how employment of Indigenous people will be managed:

- Details on the work to be carried out for each position proposed to be filled by an Indigenous person
- Strategies for recruitment of Indigenous persons
- Strategies for retention of Indigenous persons
- Succession planning and
- Staff management.

**Skills Development Plan** - how the Contractor or its subcontractor(s) intends to maximize the training and skills development of Indigenous persons through:

- Apprenticeship programs
- Pre-professional programs
- College programs
- On the job training and
- In-house training programs.

**Indigenous Business Plan** – how the Contractor intends to maximize the use of Indigenous firms, including:

- Identifying the work intended to be carried out by Indigenous firms, as well as the dollar value of the work
- Detailing how business with Indigenous firms will be managed, from developing sources of supply to administration and
- Detailing any development of new sources of supply, or new capabilities.

**Innovative Approaches and Other Measures** - any measures that produce Indigenous benefits and are not covered by previously listed categories. These include, but are not limited to:

- Specialized training or programs required for employment onsite
- Other activities related to but not specifically detailed in the Statement of Work
- Participation in careers events, such as high school visits, career presentations and scholarships
- Community outreach Projects to create a positive image and
- Innovative approaches that could stimulate economic development of Indigenous communities and contribute to capacity building for Indigenous Businesses and peoples.

## 5.7 Engagement Plans to Completion of the Project

The plans for Indigenous engagement comprise the following steps:

- Continue to communicate with Indigenous communities that have yet to engage fully to keep them informed of the status of the Project, hold out opportunities to collaborate, and continue to offer funding support for their engagement;
- For Indigenous communities that are now starting their engagement activities, ensure the timely provision of funding to support their activities and work in collaboration according to their stated issues and priorities;
- For Indigenous communities with signed agreements, work plans and budgets in place, continue to share project documentation, support their participation in studies, and be receptive to comments and concerns about the Project.

Engagement will be on-going with interested Indigenous communities, throughout the Project design and development as well as operation of the new Project. The importance of the Project to all parties and the extent of the Project planning process will give opportunities for those who wish to start engaging at a later date.

The next phase of engagement will include review of draft Terms of Reference for studies to seek comments, contribute Indigenous Knowledge, identify concerns, assess potential impacts and develop mitigation strategies as needed. This would also give indigenous communities opportunities to plan their own studies. Project studies will begin in 2023, and engagement will focus on how Indigenous communities wish to participate, whether through conducting their own studies, working alongside the Project team, or commenting on draft reports as they are prepared.

Collaboration on Indigenous Participation Plans will be continuous as more procurement opportunities occur on the Project and on similar federal bridge projects in the National Capital Region. The IPT will be receptive to Indigenous interest in business opportunities, employment, subcontracting, training, apprenticeship and other innovative measures that the communities may identify.

Monitoring activities during the deconstruction of the current bridge and its eventual replacement have not been discussed in detail yet with Indigenous communities but it will be a significant part of future discussions. Similarly, the long-term operations of the bridge are expected to provide economic opportunities for decades to come.

Table 5-2 summarizes the Project's proposed engagement activities for each phase of the impact assessment process, design stages and into operation of the new bridge.

**Table 5-2: Past and Proposed Engagement Activities for the Project.**

Year	Phase	Engagement Activities
2020 to 2022	Pre-Planning	<p>The IPT engaged with all interested and potentially impacted Indigenous communities and organizations to introduce the Project.</p> <p>The IPT engaged Indigenous communities and organizations to create work plans and execute agreements to provide funding to support their engagement in the design stages and impact assessment process.</p> <p>The IPT sought information from Indigenous communities and organizations on values of importance, potential effects and impacts related to changes in health, social, economic and environmental conditions due to the Project.</p> <p>The IPT sought direction from the communities concerning:</p> <ul style="list-style-type: none"> <li>• cultural practices to be followed</li> <li>• expectations for time allotted for review, dialogue and collaboration</li> <li>• language or format of information shared</li> <li>• how Indigenous governments require to be kept informed</li> <li>• working committees to be formed</li> <li>• specific studies that an Indigenous community may lead or participate in</li> <li>• how various Indigenous communities choose to work together in relation to the Project and</li> <li>• how Indigenous knowledge will be used and protected.</li> </ul> <p>The draft Initial Project Description was shared with Indigenous communities and organizations to incorporate their comments and requirements prior to official submission to the IAAC.</p> <p>The IPT considered how to establish funding agreements and consultation protocols with the Indigenous communities and organizations.</p> <p>The IPT addressed concerns from the IAAC’s summary of issues stemming from posting of the IPD to the registry, which required additional engagement to understand the potential impacts of the Project on Indigenous communities and organizations.</p>

Year	Phase	Engagement Activities
		<p>The IPT engaged with Indigenous communities and organizations to plan studies and address initial issues, including exploring mitigation measures and enhancements.</p>
<p><b>2023 to 2024</b></p>	<p><b>Planning</b></p> <p><b>Impact Statement / Concept Design</b></p> <p>(Process - Phase 2)</p> <p><b>Impact Assessment / Functional Design</b></p> <p>(Impact Assessment Process - Phase 3)</p>	<p>The IPT will collect and validate information from Indigenous communities and communities on matters such as baseline conditions, technical expertise including Indigenous Knowledge, potential effects and impacts on health, social, economic and environmental conditions, enhancement measures, and mitigation and follow-up measures to address potential adverse effects or impacts of the Project.</p> <p>The IPT will engage with the Indigenous communities and organizations to address any gaps in the proposed studies.</p> <p>The IPT will engage with Indigenous communities and organizations on the design of the replacement bridge.</p> <p>The IPT will work with the Indigenous communities and organizations to carry out the Indigenous Participation Plans, including liaison with potential private sector contractors for a mutual understanding of challenges and opportunities, and with parties that can assist with training, education, apprenticeship, job site support and other factors critical to the success of Indigenous workers and contractors.</p> <p>The IPT will work with Indigenous communities and organizations to create and carry out Indigenous Participation Plans to generate socio-economic benefits for their members, including identifying obstacles and barriers to education and employment and working together to address the problems.</p>
<p><b>2025</b></p>	<p><b>Decision Making Impact / Preliminary Design</b></p> <p>(Decision Making – Phase 4)</p>	<p>The IPT will continue to consult with the Indigenous communities and organizations throughout the life of the Project.</p> <p>The IPT will also participate in IAAC-led consultations with Indigenous communities.</p> <p>The IPT will provide comments and follow-up program measures outlined in the IAAC’s draft Impact Assessment Report and potential conditions.</p>





Year	Phase	Engagement Activities
<b>2025 to 2027</b>	<b>Post-Decision / Detailed Design</b>  (Post-Decision - Phase 5)  Procurement and Detailed Design	<p>The IPT will engage with Indigenous communities and organizations on the design of the replacement bridge.</p> <p>The IPT will work with Indigenous communities and organizations to carry out the Indigenous Participation Plans.</p>
<b>2028-2031</b>	Construction  Monitoring and adaptation	<p>The IPT will work with Indigenous communities on monitoring and enforcement of contractual provisions to prevent the occurrence of negative impacts and effects.</p> <p>The IPT will work with Indigenous communities to ensure the provisions of the Indigenous Participation Plans are being realized.</p>
<b>2032 and beyond</b>	Operations	<p>The IPT will work with Indigenous communities on monitoring and to adapt mitigation measures as required.</p> <p>The IPT work with Indigenous communities to ensure the provisions of the Indigenous Participation Plans are being realized.</p> <p>Annual reports will be shared and discussed with Indigenous communities.</p>



## 6 ENGAGEMENT WITH GOVERNMENT ENTITIES

### 6.1 Summary of Past Engagement with Government Entities

#### 6.1.1 Municipal and Public Transportation Engagement

As part of the LCCA (MMM Group Ltd, 2018) a limited consultation process with five (5) stakeholders occurred in December 2016. These stakeholders, also considered regional transportation partners, included the City of Ottawa, the Ville de Gatineau, the Société de transport de l'Outaouais (STO), OC Transpo, and the NCC. The purpose of the consultation was to obtain stakeholder input and comments on the expected and desired functionality of the Alexandra Bridge crossing. In general, it was agreed that the functional requirements of the existing crossing should be maintained as a minimum, although all parties expressed interest in improving the functionality of the crossing for pedestrians and cyclists.

The consultation revealed that there were not any major conflicting views between the stakeholders, several common points were established and are summarized below:

- There is no inclination towards providing additional vehicular capacity towards or across the Alexandra Bridge
- Active and sustainable transportation are a priority with pedestrians and cyclists at the crossing being important in the active transportation network
- It would be desirable to increase the person capacity without increasing the vehicular capacity but rather increasing the transit ridership and promoting active modes of transportation and
- Maintaining the multi-use pathway (boardwalk) is a must with priority to providing increased/sufficient widths and separation between pedestrian and cyclists

#### 6.1.2 Engineering Partners Engagement and Collaboration

Engagement and collaboration of engineering and transportation agencies related to Interprovincial Bridges and the Project was established among Federal, Provincial, Municipal transportation partners and other stakeholders.

The NCC, PSPC, Ministry of Transportation Ontario (MTO), Ministry of Transportation Quebec (MTQ), City of Gatineau and Ottawa, STO, OC Transpo, and Zibi (which is a waterfront community that is currently under development in close proximity to the Project area) began meeting during the flood in 2019 to coordinate transportation concerns given that the Chaudière Crossing was closed due to unprecedented water levels and threatened to close the downstream Portage Bridge. The partners lead jointly by NCC and PSPC coordinated the revision of transportation routes during the flood.

This partnership continues with the Partners sharing upcoming construction Projects to ensure that the travelling public is not adversely affected by adjusting scheduled works when possible. This includes planning for when the Alexandra Bridge is no longer in service, and reconstruction begins in 2028.

This partnership has also served to discuss the functional requirements of the replacement Alexandra Bridge as well as the future design of the at the North approach of the bridge (corner of rue Laurier and boulevard des Allumettières in Gatineau) that is under additional study. As recently as December 2020, PSPC benefited from this partnership to communicate the possible closure of the Alexandra Bridge from January 2, 2021, to June 14, 2021, as urgent repairs were required. The bridge was closed to enable repairs during this period.

### 6.1.3 Spring 2020 Partner Engagement

A Feasibility Study completed by Parsons in July 2019 assessed options for an interprovincial transit loop between Ottawa and Gatineau. A virtual meeting was held on March 26, 2020, between the NCC and PSPC to discuss the study findings. Part of the study involved the replacement of the Alexandra Bridge, and the following is a summary of the meeting findings with respect to the Alexandra Bridge replacement:

- A double-decker bridge option was discussed but was found to present a number of challenges.
- It was agreed that a 2-vehicle lane option appeared to be the most favourable compared to 3 and 4 vehicle lane options that were under consideration. The two lanes could potentially be shared between trams and traffic or converted to tram-only in the future.
- The City of Ottawa and Ville de Gatineau have previously requested that traffic capacity not be added to the bridge design.
- It was recommended that the existing 2.4 m Bikeway and 0.6 m buffer be reconstructed to at least meet the current standard minimum widths of 3.0 m and 1.0 m, respectively.

### 6.1.4 Federal Agencies Engagement

Engagement has also taken place with Federal Government agencies to coordinate early design considerations and opportunities for enhancements as the Project details are developed. Specifically, information sessions have been held by the NCC and PSPC with Transport Canada (TC) and Fisheries and Oceans Canada (DFO) in December 2020 and January 2021.

These preliminary meetings were an opportunity for NCC and PSPC to present the early details of the Project, as well as potential impacts and mitigation measures documented to date. For TC and DFO, the meetings were a chance to explain in further detail the requirements and timelines associated with their respective permit application processes, in addition to sharing any best practices or enhancements used for past similar bridge related projects.

Fisheries and Oceans Canada has a particular interest in the placement of the new structure footprints, as well as approaches to be used to protect fish and mussel species at risk. The DFO Request for Review and Project Authorization can be completed collaboratively in the early stages of the Project, and the DFO team from the Ontario region will be in contact with the associated Quebec region. This process will involve a review of the proposed Project to identify the potential impacts to fish and fish habitat. The IPT will work with DFO to ensure that impacts are managed in the best way possible.

Transport Canada discussed the importance of maintaining vessel passage and advance notice of any short-term interruptions to navigation. The TC authorization has a pre-submission service and will aid in achieving the requirements defined under the Navigable Waters Act.

### 6.1.5 Provincial Impact Assessment Agencies Engagement

Engagement of Provincial Environmental Assessment Agencies was initiated in early summer 2021 to understand their regulatory requirements and explore ways to harmonize these. The contacts will be provided once established, along with information such as timelines, consultation plans, and issues/effects that the regulatory oversight would manage.

Ontario Environmental Assessment Services will be engaged through the Impact Assessment Agency's standard process. Once they receive the Initial Project Description from the Agency, they will coordinate the distribution to various Ontario Ministries for comments.

Ontario Environmental Assessment Services does not anticipate that the Project will trigger the need for a provincial assessment but recommended that the specific Ministries be contacted to ensure that Class Environmental Assessments are not triggered, particularly for alteration of the bed and shore of the river under the Lakes and Rivers Improvement Act.

Engagement with the following Ministries was recommended:

Ministry of Natural Resources and Forestry (MNRF)

- A disposition may be required for the footprint of the bridge
- Possible permit for Waterworks/impacts to riverbed

Ministry of Tourism, Culture and Sport (MTCS)(archaeological interest)

- To engage in discussions related to archaeological interests
- Permit maybe required if archaeological artifacts are found during the Project

PSPC and NCC will continue to engage the Province of Ontario as the Project progresses to apprise them of conversations with other Ministries or stakeholders.

The Government of Quebec's Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks indicated that details regarding water encroachment are needed to determine how the Project qualifies under environmental impact assessment legislation. A Project that encroaches within the 2-year flood limit, over a distance of 500 m or an area of 5000 m<sup>2</sup> or more is subject to the province's environmental impact assessment procedure. This applies to both temporary and permanent encroachments. Should the Project require an impact assessment under provincial legislation, the IPT will work with the IAAC to harmonize the processes and coordinate with the Quebec Environmental Assessment office. Details of the design for the new bridge as well as temporary structures will be provided as they become available.

## 6.2 Plans for Future Engagement with Government Entities

The IPT has engaged with planning and engineering teams of the City of Gatineau, Ministry of Transportation Quebec (MTQ), City of Ottawa, and the Ministry of Transportation Ontario (MTO) to explore potential functional alignments and designs, in keeping with approved plans and guidelines such as the NCC's Confederation Boulevard Planning and Design Principles (refer to Appendix [G](#)) and the Ottawa River North Shore Parklands Plan ([NCC, 2018b](#)). Additional meetings with both municipalities and other government entities will be held as needed to discuss matters related to design issues, planning and coordination.



## 7 ENVIRONMENTAL STUDIES, REGIONAL PLANNING AND STRATEGIC ASSESSMENT

No regional studies, as defined under Section 93 of the *Impact Assessment Act*, have been or are currently being conducted in the Project area.

Similarly, no strategic assessment, as defined under section 95 of *the Act* has been completed to date.

Assessments, scans and studies have been undertaken in the past for other purposes and Projects ([Appendix F](#)). This information will be referred to and used, as applicable, to support the current Project. Table 7-1 provides an outline of the documents that will be referenced.

**Table 7-1: Outline of scans and assessments that were completed in 2003, and 2018 respectively.**

Scans, Studies and/or Plans	Completion Date	Details/Objectives of the Scans, Studies and/or Plans
Environment Assessment Screening (produced by DST Consulting Engineers Inc.)	2003	<ul style="list-style-type: none"> <li>An Environmental Assessment Screening (EAS) of the Bridges: The Chaudière Crossing, the Macdonald Cartier, and <i>the Alexandra Bridge</i>.</li> <li>The EAS, highlighted areas of concern such as: the impacts on the Ottawa River, Cumulative effects, forestry waste, impacts on oil, and gas.</li> <li>Highlighted individual mitigation measures for impact on biology, soil quality, water Groundwater quality and socioeconomic</li> </ul>
Preliminary Scan	2018	<ul style="list-style-type: none"> <li>A preliminary scan was conducted to gather early environmental considerations for three (3) interprovincial bridges: The Chaudière Crossing, the Macdonald Cartier, and <i>the Alexandra Bridge</i>.</li> </ul>

In addition to the existing scans and assessments, the NCC has Plans and Guidelines that form the basis of the proposed Project's evaluation under the FLUDTA process. A few of the most critical documents which will impact the analysis of Project alternatives include:

- The Plan for Canada's Capital 2017-2067 (2017)
- Canada's Capital Core Area Sector Plan (2005), currently under review
- Confederation Boulevard Guidelines, Management and Stewardship of Our Capital Legacy (2011)
- Ottawa River North Shore Parklands Plan (2018)
- Canada's Capital Views Protection Plan (2007)
- Capital Illumination Plan, 2017-2027 (2017)
- Capital Pathway Strategic Plan (2020)
- NCC Sustainable Development Strategy, 2018-2023 (2018)

These plans and guidelines will also be used to support the Project, as applicable.

As part of the Project plan development and to address any information gaps, there are several studies to be conducted within the next two (2) years. Anticipated studies and assessments are further enumerated in Section 15.3 and will focus on the biophysical environment, cumulative effects, benefits/impacts to Human health, heritage, economics, and Indigenous communities (conditions related to their rights).

#### **Strategic Assessment (Climate Change)**

Under the Federal Sustainable Development Strategy ([FSDS](#)) ECCC 2019, the Government of Canada has made a commitment to "take action to understand the wide range of climate change impacts that could potentially affect federal assets, services and operations across the country." In addition, as stated in the FSDS, "All major real property projects will integrate climate change adaptation into the design, construction and operation aspects." In addition, a [Greening Government Strategy: A Government of Canada Directive](#) states that "Departments will ensure that all new buildings and major building retrofits prioritize low-carbon and climate resilience. Investment decisions will be based on total cost of ownership: [...] all new federal buildings, infrastructure and major building retrofits, including significant energy performance contracts, require a climate change risk assessment that incorporates both current and future climate conditions in the analysis".

As such and in keeping with section 95 of the Act and the FSDS, a Climate Risk Vulnerability Assessment (CRIVA) on Potential Climate and Weather Impacts will be conducted as part of the Project (see section 15.3.1). This assessment will provide a clear picture of the main threats, including nature and severity of the vulnerability of the infrastructure (the bridge), the level of risk, and the strategies for mitigating the impacts of climate change. Recommendations of the assessment will be considered in the design of the new bridge to enable the reconstruction of a new asset that is more resilient to sudden and protracted climatic events and conditions.



## Part C: Project Information

### 8 PROJECT PURPOSE AND NEED

#### 8.1 Purpose of Project

As part of a broader effort to improve interprovincial transportation in the NCR, the government mandated the replacement of the Alexandra Bridge in Budget 2019. The existing steel superstructure of the Alexandra Bridge has been demonstrating signs of on-going and accelerated deterioration since the last 2009-2010 rehabilitation contract. The deteriorating steel condition combined with the need to replace the existing east and west side cantilever decks as well as the cost to maintain the structure in a safe operating condition led PSPC to study alternatives. In 2016, PSPC commissioned a LCCA to compare rehabilitation of the existing bridge against its replacement. The bridge has had a long history of repairs and modifications over its life with the last major rehabilitation completed in 2009-2010 and additional work at the trestle spans completed in 2014. In 2016-2017, local replacement of deteriorated steel members and recoating work was also completed.

The LCCA concluded that it will be more reliable and economical, as well as posing lower risk for public safety over the long-term to replace the bridge rather than continuing to maintain it over the next 75 years. The replacement would involve the closure and decommissioning of the existing bridge prior to or in parallel with (twinning) building the new bridge and integrating it with existing and/or new approaches. The general route of the bridge would be unchanged, and the new bridge would be designed to remain an integral part of the National Capital Region's Confederation Boulevard. Changes to existing land and river infrastructure would be kept to a minimum except where improvements are necessary and/or desirable. This could include ecosystem enhancements where appropriate and applicable. Motor vehicle capacities will be maintained at existing levels, while the total available capacity for active transport will increase as the lanes are expected to be wider than the existing boardwalk. Provision for adaptation to accommodate a tram or light rail system will also be included as part of the new bridge design.

#### 8.2 Need for the Project

The Alexandra Bridge is an integral part of Confederation Boulevard's Ceremonial Route and links together the heart of Canada's National Capital Region (NCR) from Major's Hill Park to Jacques-Cartier Park, to the Voyageurs Pathway and the Ottawa River Pathway. Given its deteriorating condition and the potential loss of this vital structure, options that take into account future needs including active mobility transportation, transit (e. g. tram) and private vehicles must be considered.

The Alexandra Bridge is one of only five interprovincial bridges open to vehicular traffic in the NCR linking the cities of Ottawa, Ontario and Gatineau, Quebec. According to a 2017 City of Ottawa traffic study, the bridge carries about 13,300 vehicles per day, which amounts to approximately 9% of the average daily interprovincial vehicular traffic in the NCR (IBI Group, 2020). Table 8-1 provides the volume and direction of vehicular traffic during morning and evening peak hours. The bridge is also used by about 33% of all pedestrians and cyclists crossing the Ottawa River (City of Ottawa, 2013), making it a key piece of active transportation infrastructure in the region.



**Table 8-1: Volume and direction of vehicular traffic during morning and evening peak hours.**

Direction of traffic flow	Morning peak	Evening peak
Ottawa to Gatineau	550 vehicles/hour	850 vehicles/hour
Gatineau to Ottawa	700 vehicles/hour	750 vehicles/hour

Source: IBI Group, 2020

All existing interprovincial bridges are currently functioning at capacity during peak times from a motor vehicle perspective. However, encouraging active mobility transportation by creating a high quality and meaningful experience for all users could help relieve this situation. In addition, vehicular capacity is affected by construction activities, collisions, disabled vehicles, inclement weather, and a variety of other factors. If the Alexandra Bridge is not available for vehicular use, the increase in travel demand will exacerbate the current capacity constraint over the Ottawa River. Some of the key impacts of the transportation network congestion on the NCR and its residents may include:

- Lower quality of life due to additional time spent on congested roadways
- Increased fuel consumption and auto emissions due to lower travelling speeds and increased idling
- Delays to persons or movement of goods, equating to an economic loss for both Ottawa and Gatineau
- Impacts to tourism, which is normally a major contributor to the NCR economy and for which the Alexandra Bridge is an important piece of infrastructure
- Impacts to navigation along the river during all construction related activities

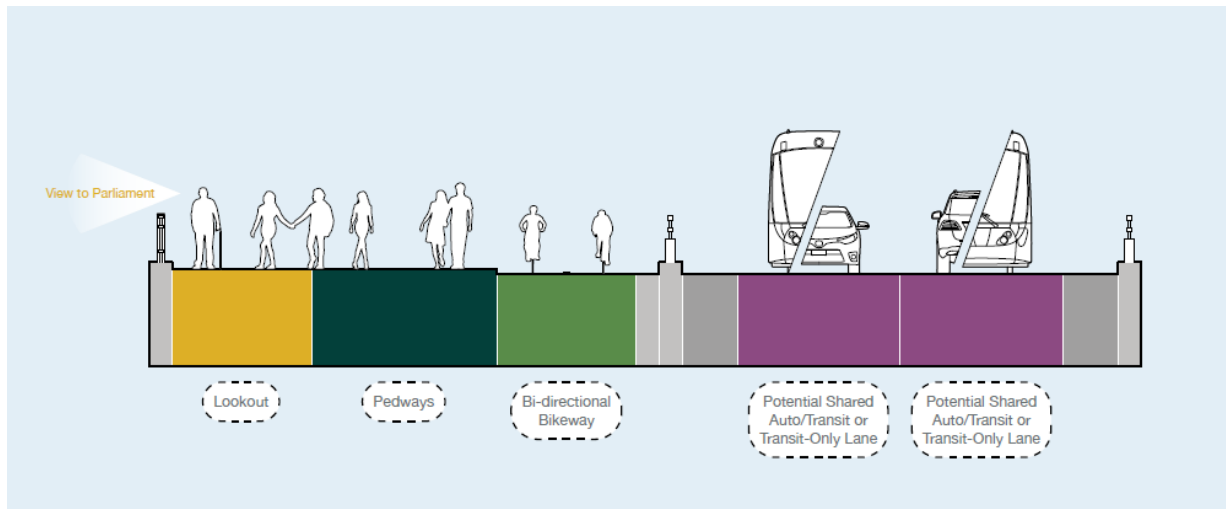
Additionally, PSPC’s standards for bridges are to maintain them to a level of service consistent with accepted industry practices which is described as a minimum condition of ‘Fair’. This equates to a rating of four (4) out of six (6) as per the PSPC Bridge Inspection Manual. In 2017 PSPC commissioned a Comprehensive Detailed Inspection (CDI) (WSP, 2017), which classified the Alexandra Bridge as “inadequate” and rated its condition as two (2), meaning that the minimum established standards are not met. From a reliability of service standpoint, the interventions planned in the next 25 years would result in ongoing and unforeseen closures and disruptions to traffic with the rehabilitation approach compared to a replacement Project. A 2018, Asset Condition Risk Assessment (KPMG 2018), completed for PSPC determined that after completing the 10-year program of work, the bridge's risk level would remain high in terms of safety and structural integrity.

Based on these factors, in December 2018, the IPT was directed by government policy, to address repairs, replacement and operations for all five crossings in the NCR. The replacement of the Alexandra Bridge is a component of this holistic strategy. Funding was provided to PSPC in Budget 2019 to plan and implement this Project. The replacement of the Alexandra Bridge was also cited in the Minister of PSPC’s Mandate Letter in 2019 and 2021.

## 8.3 Functional Requirements

Through development of the Project Planning and Design Principles and engagement with key stakeholders, the following minimum functional requirements for the replacement of the Alexandra Bridge have been identified (refer to Figure 8-1):

1. Two lanes for vehicle traffic (one in each direction) designed to be adapted in the future for public transit via a tram or light rail system.
2. One lane for active mobility (e.g., pedestrians, cyclists, users with mobility aids, etc.) on the upstream (west) side of the bridge. The active mobility lane will be bidirectional, with separation of pedestrians and cyclists. The active mobility lane should include seating and viewing locations that provide rest points without compromising safety or obstructing users.
3. The traffic lanes and the active mobility lane will have a solid surface that will protect the bridge from the elements, de-icing products and dirt. This will allow for a longer-lasting structure.



Source: Planning and Design Principles (refer to [Appendix G](#))

**Figure 8-1: Section of the potential future traffic lanes**

The new bridge is expected to retain its orientation, as well as a suitable alignment and adequate proportions to fit harmoniously into the urban fabric and to pay homage to the history of the National Capital. It must highlight the predominant usage characteristics of the current bridge, which acts as the main pedestrian link between the Ontario and Quebec shores. The bridge must also act as a landmark in the landscape without dominating the area.

With regard to Confederation Boulevard, the vision is to create:

- A Memorable Image that is dignified, unique and lasting, and that is reflective of Canadian values, heritage and achievements
- A Vibrant Public Place that presents Canadians with a range of opportunities for enhanced community, intellectual and emotional experience
- Pedestrians First Boulevard that gives priority to the comfort, safety and enjoyment of pedestrians, as well as the accommodation of cyclists, public transit and other vehicles
- Universal Accessibility to all persons, and shall extend accessibility to those beyond and the National Capital through a range of communication media and
- Sustainability demonstrated through leadership in environmental sustainability and stewardship.



## 9 PROVISIONS DESCRIBING THE DESIGNATED PROJECT

This Project involves the replacement of an existing interprovincial bridge which connects the provinces of Ontario and Québec. This constitutes a designated Project under Section 48 (a) of Schedule 2 of the *Physical Activities Regulations* (SOR 2019-285) under the Transport subsection:

48 The construction, operation, decommissioning and abandonment of either of the following:

- (a) a new international or interprovincial bridge or tunnel

This section does not require the meeting of a threshold in terms of size or other specifications. The Project is thereby designated as the construction of an interprovincial bridge.

## 10 POTENTIAL ALTERNATIVES

From the Project's inception, alternatives and methods of carrying out the Project have been under consideration within the planning team and with external stakeholders. As the Project progresses, the IPT will work with interested Indigenous communities to collect and validate Indigenous Knowledge to inform the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments and to contribute to the design of the new bridge to achieve the vision of creating a bridge reflective of Canadian values and identity.

### 10.1 Alternatives to the Project

As directed by the Federal Government as part of Budget 2019, PSPC and the NCC are working to develop a holistic strategy to ensure that the five (5) interprovincial crossings in the NCR remain safe and open for use by residents and visitors. This strategy includes pre-planning for the replacement of the Alexandra Bridge. Funding was provided to PSPC in Budget 2019 to plan and implement this Project. The replacement of the Alexandra Bridge was also cited in the Minister of PSPC's Mandate Letter in 2019 and 2021.

In the LCCA report (WSP, 2018) prepared for PSPC, two alternatives to the Project were assessed using conceptual designs that were developed as part of the report. The two major alternatives assessed were:

- rehabilitation and continual maintenance of the existing bridge
- replacement of the bridge.

Deloitte LLP (March 2022) was retained to analyze the socio-economic impacts associated with the closures of the Alexandra Bridge given these two scenarios.

This section provides a description of the condition and concerns for the long-term stability of the bridge at the root of the decision. In addition, the section presents a detailed comparison of the environmental, health, social, cultural, and economic effects of the alternatives considered.

## 10.1.1 Condition Assessment of the Bridge

The bridge has experienced significant deterioration that will only accelerate over time. Deteriorating steel, the need to replace the existing East and West side cantilever decks, and high capital expenditures required to maintain the structure in a safe operating condition led PSPC to evaluate the rehabilitation versus replacement options. The LCCA report (WSP, 2018) concluded that the Alexandra Bridge is at the end of its life cycle, with replacement warranted as the most cost-effective alternative, given the bridge's advanced age and accelerating rate of deterioration.

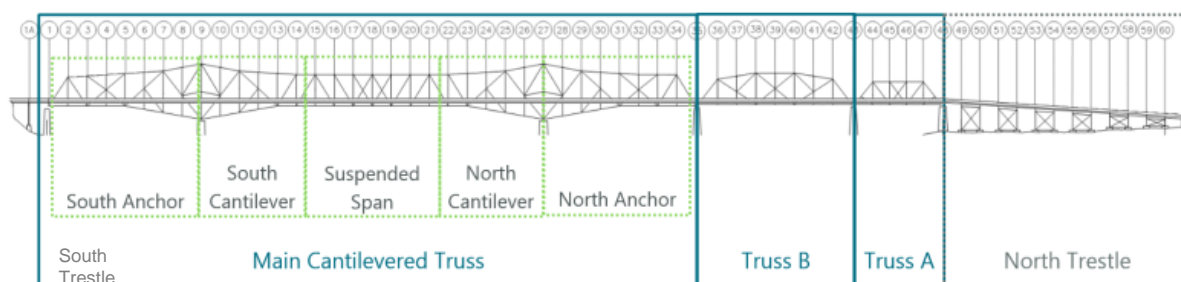
Overall, the structure is currently in "inadequate" condition (rating of 2 on a scale of 1 to 6). This rating is based on the critically "inadequate" condition of the Boardwalk steel grating and stringers, the presence of crack indications on primary tension members of truss A and truss B, the structural articulation concerns, and the component buckling concerns. The minimal rating at which PSPC bridges are to be maintained is "fair" (rating of 4).

The condition of the bridge has resulted in the current reduced level of service and implementation of several mitigation measures by PSPC. Currently, the mitigation measures and reduced level of service are sufficient for the Alexandra Bridge to remain safe and in service until its replacement.

Both major options identified (rehabilitation or replacement) will cause disruption to transportation and active users and multi-year shutdowns are expected. These are further described in the following section.

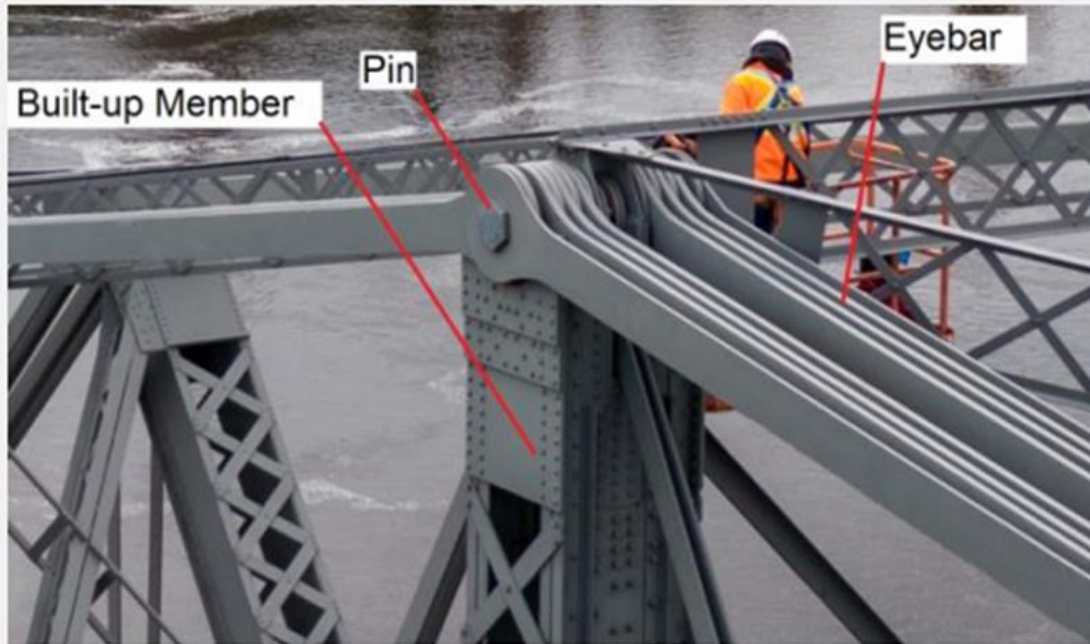
### Structure of the bridge

The bridge is composed of 5 spans, which are (from Ottawa to Gatineau): the South trestle, the main span which is a cantilever truss, truss B, truss A, and the North trestle (refer to Figure 10-1).



**Figure 10-1: Diagram showing main components of the bridge under assessment.**

The trusses of the main span, truss B and truss A are composed of a combination of eye-bars, built up members and pins, as can be seen in Figure 10-2. At the time of construction, a truss bridge provided an efficient solution for the long lengths required to span the Ottawa river. Construction of truss bridges is less common today due to high construction costs and significant maintenance required because of the large exposed surface areas and corrosion prone connections. The condition of the trusses continues to decline. These members have little to no redundancy, therefore if one main tension or compression member of the trusses fail, the entire truss may collapse.



**Figure 10-2: Principle structures of the Alexandra Bridge**

Exposure to our climate and chlorides (road salts) has resulted in significant corrosion over the years, especially in the vehicular splash zone and below deck. Over the years, many elements were replaced, and built-up sections partially repaired to address this issue. The work so far has been limited to the easier and more accessible repairs.

A Comprehensive Detailed Inspection (CDI) completed by WSP in 2017 (WSP, 2018), found that corrosion was the main deterioration mechanism of the primary structural members. The progressive nature of the corrosion for steel structures of this complexity are such that the progress rate tends to accelerate once established. The complex assembly of the bridge allows and promotes opportunities for localized corrosion and makes repair extremely challenging, particularly in the nodes of the truss connections and eye-bar members. Despite rehabilitation efforts, deterioration of the bridge continues. Significant structural challenges are foreseeable for component repair and/or replacement due to restrictions at the highly congested and highly critical pin connection. Several mitigation strategies were implemented because of this CDI including load restrictions on the boardwalk, access restriction to inspection vehicles, and capacity limits during special events.

A subsequent CDI was completed by CIMA-Dillon Joint Venture (CDJV) in 2020 (CIMA-Dillon, 2021) which included section loss measurements, detailed damage surveys of select members, and field measurement required for component buckling analysis of select details. The work included the development of a rehabilitation program for the Alexandra Bridge to maintain the bridge safe and in service until the planned replacement within 10 years.

## Condition of the bridge components

**It is important to note that the photos shown below, and the issues described are provided to give a clear understanding of the status of the bridge. A rigorous monitoring program and several mitigation measures are in place to ensure that the bridge remains safe for public use.**

Bridges are inspected and rated using the *PSPC Bridge Inspection Manual*. The inspection reports provide an overall *Structural* and *Functional* rating for the bridge and provide individual ratings for each member. The *Structural* condition represents the condition of the bridge and the level of repair that's required to bring it up to the *Canadian Highway Bridge Design Code* requirements. The *Functional* condition provides an appreciation for the bridge's functional performance based on current standards.

Based on the 2020 CDI report (CIMA-Dillon, 2021), there were 17 significant structural concerns identified. Table 10-1 provides a description of all identified concerns, mitigation measures in place and suggested actions.

Concerns being addressed through the ongoing program of repairs, mitigation and monitoring can be categorized into broad groupings as follows:

- the boardwalk and East lane floor systems
- structural articulation concerns – bearings, pin mobility and, pin and hanger assemblies
- buckling concerns
- concerns related to the eye-bars and pins - section loss, cracks, and rust jacking

### *Boardwalk floor system*

The West lane, known as the boardwalk, is dedicated to active transportation. The wooden planks of the boardwalk are supported by open steel grating installed in the mid 70s. It is the same grating as on the East lane (travel from Ottawa to Gatineau). The grating is in “critically inadequate” condition that represents a rating of “1” (on a scale of 1 to 6) and is the lowest rating possible. Figure 10-3 shows the condition of the grating with severe corrosion and perforations.



**Figure 10-3: Condition of the grating under the Boardwalk**

The deterioration is mainly due to exposure to chlorides (road salts) and because cleaning the grating and stringers under the wooden planks is not possible. In 2019 and 2020, the most critical areas were blocked using wooden wedges (see Figure 10-4) to provide short term support to the grating.



**Figure 10-4: Timber wedges to provide short term support to the grating.**



In addition, since 2018, the boardwalk is tested monthly to ensure that it has the required strength to support the load from everyday use. During events, such as Canada Day, fireworks or demonstrations, the boardwalk lane is either closed or the size of the crowd is controlled. The grating is anticipated to need additional support until the replacement work begins. In the upcoming rehabilitation project, work is planned to strengthen the stringers and construct a new timber deck that does not rely on the grating for support.

#### *East lane floor system*

The East lane of the bridge (travel from Ottawa to Gatineau) varies from “fair” to “critically inadequate” condition and it too has reached the end of its service life. For more than a decade, the grating has been repaired twice a year. Of note, the number of repairs that need to be completed are increasing each year. The objective of the repair program is to minimize the risk of localized grating failure and avoid replacement of panels before the bridge is replaced. The yellow lines in Figure 10-5 show the location and types of cracks that form in the grating and need to be repaired.



**Figure 10-5: Cracks in East lane grating that require repair**

Figure 10-6 shows that cracking of the bars has led to a local failure. It should be noted that the 6-inch main load carrying bars have seen only a few repairs to date and therefore the local failure concerns are limited to the smaller bars at this time.



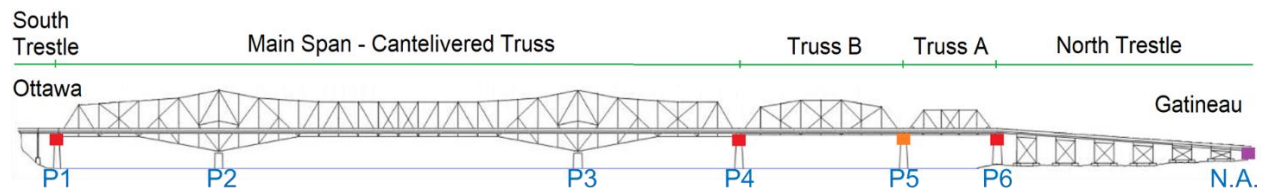
**Figure 10-6: Local failure of the East lane grating**

*Structural articulation concerns - bearings*

The Bridge has movable bearings at piers 1, 4, 5, and 6 (see Figure 10-7). The function of bearings is to collect all the forces on the structure and transmit them down to the foundation. They also permit the natural expansion and contraction of the structure as the temperatures change.

Inspection of the bearings in recent CDIs have shown that:

- bearings 1 and 4 are fully seized and the piers are accommodating some of the movement
- bearing 5 can be moved when thermal loading is high enough to overcome the resistance
- bearing 6 is seized
- and finally, the short steel columns at the North abutment have no bearings and are designed to be fixed, however, because bearing 6 is not moving, the steel columns have begun to move.



**Figure 10-7: Piers supporting the bridge and bearings of concern**

The bearings (Figure 10-8), more than 50 years old and beyond their design life, are susceptible to long term wear and corrosion. As bearings wear down or corrode, they become less efficient at accommodating movement. In turn, this causes the structure or foundations to experience additional forces for which they were not designed.

These additional forces can be extremely high. When the forces are high enough, the bearings may move again, piers may move, or members will bend or buckle. The structure has undergone recent studies to attempt to quantify these forces. For example, the piers have been monitored and found to

move to accommodate the lack of movement at the bearings. Currently, this appears acceptable, but in the long term, the piers will degrade due to the unintended bending.



**Figure 10-8: Bridge bearings**

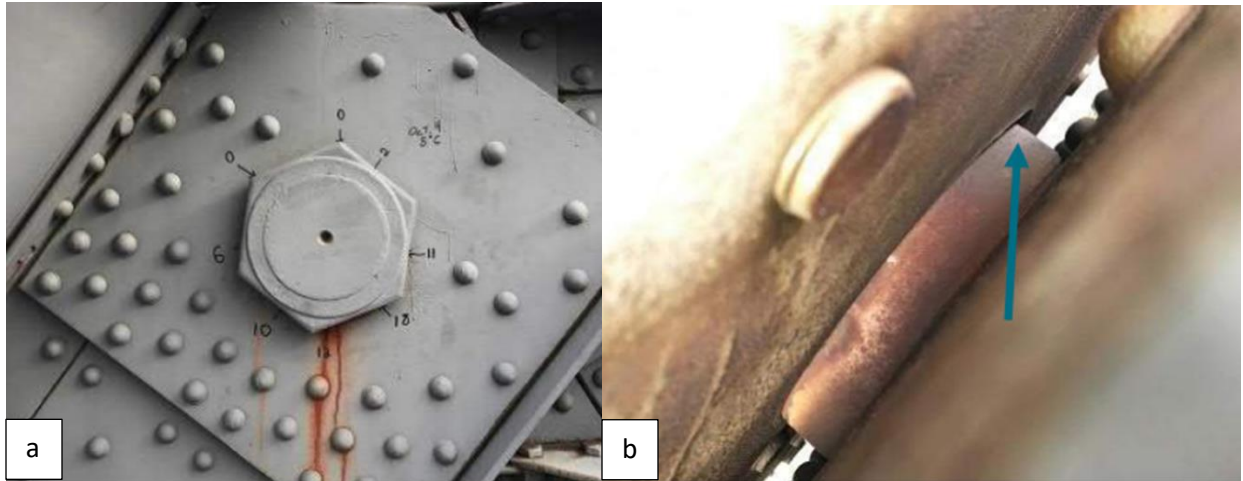
*Structural articulation concerns - pin mobility*

Cracks were noted in the portal frames at both ends of the main span's anchor arms during previous inspections which lead to a more detailed inspection of the adjacent pins. The inspection (CIMA-Dillon, 2021) found that the pins were worn down and were now able to move within their connections. This introduces a risk that bridge elements around these locations are required to pick up load in a way that is not predicted in the structural models or calculations. Figure 10-9 shows the location of the pins that are demonstrating wear issues.



**Figure 10-9: Location of pins showing wear issues**

In Figure 10-10, image (a) shows the gap in mm, between the pin and the plate. Notations on the metal indicate that up to an 18mm gap was measured. Image (b) shows the wear in the pin and the gap between the connecting member. Wearing of the pins reduces section strength and the total load carrying capacity of the elements. Studies are being conducted to potentially retrofit these four pin connections to minimize movements until replacement of the bridge.

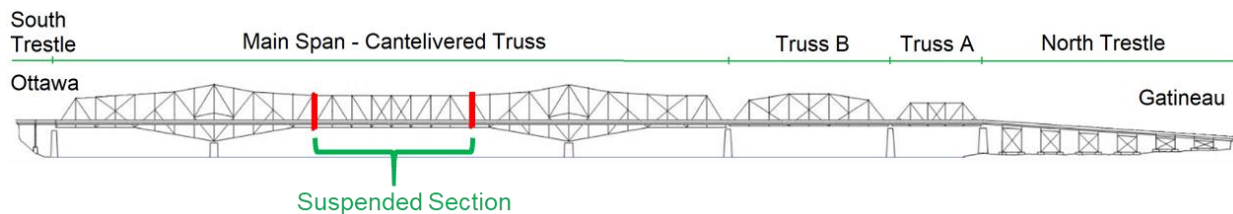


**Figure 10-10: Pins showing wear issues**

*Structural articulation concerns - pin and hanger assemblies*

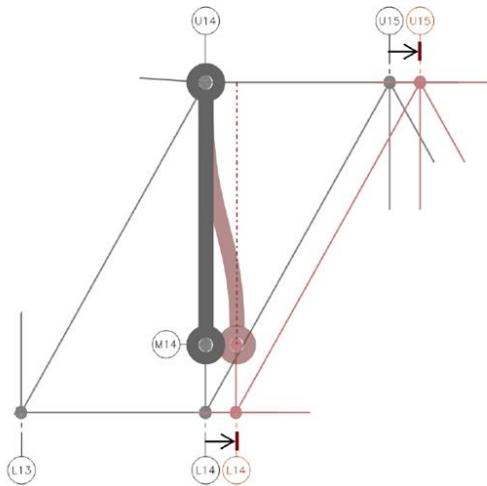
The pin and hanger assemblies of the suspended span do not function as intended and eye-bars undergo double-curvature bending. Eye-bars are primary tension members and are not designed to allow for bending.

The pin and hanger assemblies of the suspended section of the cantilevered truss are the main load carrying members that support the middle section of the main span (see Figure 10-10).



**Figure 10-11: Drawing showing the suspended section of the bridge**

The eye-bars (see Figure 10-12), were designed for tension only. They are pinned and allow for rotation. However, a recent study has shown that some eye-bars do not allow for rotation because the joint at the pin is seized by corrosion. As shown in Figure 10-12, this is now causing the eye-bars to bend, instead of rotating back and forth as originally designed.



**Figure 10-12: Diagram of bending eye-bars**

These eye-bars were not designed for bending and the combined bending and tension increases the stresses of the member and increases the risk of cracking due to metal fatigue. For example, one sliding joint has been seized for more than a decade and in response, the corresponding joint has been moving twice as much as intended to compensate. This increase in movement results in increased bending at the eye-bars and the stress at the edges is near the material's theoretical limits.

Significant monitoring efforts were deployed to monitor this situation. These critical members are being monitored by a structural "Health Monitoring System", and the upcoming rehabilitation project will add redundancy to the members of concern.

#### *Buckling concerns*

This truss bridge is constructed of built-up sections which resist tension and compression forces. Compression members can fail by two main buckling methods: global buckling where the entire member buckles and local buckling where a part of the main member buckles before the entire member buckles. Local buckling is a concern because it causes the global members to fail at lower loads.

Several locations were affected by local buckling behaviour because of a member having lost strength due to corrosion. This means parts of the built-up section will fail prior to the entire member failing. Modern bridge design codes do not permit this mode of failure. In accordance with the bridge code, members should be designed to only fail under global buckling.

With the increasing deterioration and the substandard design details used in the 1890s, many components of the bridge are governed by local buckling. As sections deteriorate, bulges and localized deformations have been noted as the components deform to redistribute the load.

Work continues to strengthen sections to address deformations and provide resistance to form a global failure mechanism. However, there are many other truss members and components within nodes which are challenging to address because of the limited access. These will continue to be inspected and 3D scanned, where possible.

Given the current mitigation measures in place, such as the load posting, buckling is not a significant concern.



**Figure 10-13: Deformation due to buckling**

*Eye-bar and pin concerns - section loss, cracks, and rust jacking*

The last concern and the most significant, is related to the condition of the eye-bars and the pins.

At connection points of pins and eye-bars, a large steel pin is used to connect built-up members and eye-bars. This forms a large assembly of layered steel members, which in many cases are held tight against one another. As the original coating failed over the years, corrosion formed between the members. This presents several issues, namely: corrosion of the steel leads to section loss in the eye-bars and pins and the potential for “rust jacking” (defined below). Every eye-bar in the splash zone and below deck have varying degrees of section loss along their surfaces. The section loss is a significant concern as it reduces load capacity of the member.

The assembly of the various components make inspection and accurate measurement of the section loss of the eye-bars at the connections extremely difficult and at times impossible (see Figure 10-14). The corrosion and lack of access make most non-destructive testing methods inaccurate and therefore assumptions on section loss and the integrity of the eye-bars must be made.



**Figure 10-14: Eye-bar assembly showing corrosion**

As the steel between the members corrodes, it expands and creates pressure that pushes members apart and can have enough force to bend plates. This is often referred to as “rust jacking”. Figure 10-15 shows “rust jacking,” the build up of corrosion material between members, that has resulted in bent plates and a channel.



**Figure 10-15: Rust jacking – the build up of corrosion material between members**

As shown in Figure 10-16, some eye-bars have cracks where the looped end ties into the bar. Some of the cracks may have formed during fabrication, however, they have likely grown over time and have been discovered in the last few years. It is speculated that they may have grown due to corrosion, fatigue stress, or a combination of both. Loosing an eye-bar could lead to a catastrophic failure of a span depending on its location and how the load is redistributed in the other members.



**Figure 10-16: Cracks in the eye-bars**

The pins cannot be accessed. As a result, engineers must make assumptions on their condition and section loss due to wear and corrosion. A growing concern is that the pins, which are designed to allow connected members to rotate under dynamic loads, may become seized and cause bending to occur in the eye-bars. Bending of eye-bars has been documented at several assemblies as previously mentioned.

Stopping the progress of corrosion at pin connections is impossible at this stage. Past attempts to stop this corrosion have failed. The Alexandra Bridge was constructed without grease fittings at the pins, which became common in the early 20<sup>th</sup> century and allow regular greasing of the pin and connected eye-bars to reduce friction and corrosion. Losing a pin would also be catastrophic. Therefore, there are several mitigation and monitoring measures in place to manage this risk.



**Table 10-1: Identified Concerns and Associated Mitigation Measures (CIMA-Dillon, 2021)**

Principal Identified Concern	Current Mitigation Measure	Medium Term Actions
<b>Condition of Boardwalk Steel Grating and Stringers</b>	<p>Load Restrictions (5 Tonne) Restrictions on Crowd Events Monthly Supervised Load Testing</p> <p>Localized replacement panels have been pre-designed to limit the loss of service should structural distress of the existing boardwalk be identified during the monthly boardwalk load testing.</p>	Retrofit/replace/repair in 2023. Maintain current mitigation measures until rehabilitation.
<b>Poor Condition of East Lane Steel Grating</b>	<p>Seasonal inspections and weld repair cycles.</p> <p>Consider more robust details for future repairs.</p>	Significant repairs and an increased risk of localized failures should be anticipated until the decommissioning of the structure.
<b>Seized Bearings at Piers 1 and 4</b>	<p>Structural evaluation performed to reflect actual articulation conditions including masonry pier behaviour.</p> <p>Structural Health Monitoring (SHM) program being implemented to monitor thermal loading in members affected (for all piers) and displacement (Pier 1 only)</p>	Continuous monitoring until decommissioning of the structure.
<b>Partially Seized Bearing at Pier 5</b>		<p>Performance is currently acceptable, and replacement is not anticipated.</p> <p>Continuous monitoring until decommissioning of the structure.</p>
<b>Seized Bearing at Pier 6</b>		Replacement of bearings as part of the 2023 rehabilitation is anticipated.
<b>Eye-bars with known Crack Indications</b>	Regularly inspected, including Non-Destructive Testing (NDT). SHM program being implemented to detect crack propagation.	Continuous monitoring using Acoustic Emissions Testing (AE) to determine need to repair/retrofit/replace in 2023

Principal Identified Concern	Current Mitigation Measure	Medium Term Actions
<b>Sub-Standard Lacing Configuration of Built-Up Members</b>	<p>Emergency strengthening performed at several locations in 2019.</p> <p>Monthly inspection of critical members.</p>	<p>Lattice replacement partially completed and temporary support (blocking) remaining in place from 2019 Steel Repair Project.</p> <p>Additional lacing retrofit and replacement anticipated for 2023.</p>
<b>Poor Detailing of Compression Members</b>	<p>Component buckling being assessed at selected details and locations.</p>	<p>Strengthening of deficient or poorly performing details.</p>
<b>Pin Mobility</b>	<p>SHM program being implemented to monitor load reversal events.</p> <p>3D scan of pin mobility node under controlled loading conditions to assess displacement of member/node.</p>	<p>It is anticipated that the 2023 rehabilitation will include pin retrofits to ensure load transfer between members at the pin connection and relative movements are minimized.</p>
<b>Pin and Hanger Assembly</b>	<p>SHM program being implemented to monitor lateral bending</p>	<p>Retrofit to provide redundancy anticipated to be included in 2023 rehabilitation.</p>
<b>Thermal Stresses (General)</b>	<p>SHM program being implemented to monitor thermal stresses.</p>	<p>2023 Rehabilitation scope of work to be adapted as needed based on SHM results.</p>
<b>Inclination of North Trestle Bents</b>	<p>3D scan and structural assessment completed based on inclination and current level of service.</p>	<p>Repeat scan needed to monitor seasonal change in inclination.</p> <p>Slip-surface retrofit of rehabilitation should reduce future inclination trends.</p>



Principal Identified Concern	Current Mitigation Measure	Medium Term Actions
<b>Additional Identified Concern</b>	Current Mitigation Measure	Medium Term Actions
<b>Lateral Bending of Floor Beams</b>	Structural Health Monitoring (SHM) program being implemented to monitor lateral bending.	Given results to date, a slip-surface retrofit of the stringer pedestals at expansion joints is anticipated as part of the 2023 rehabilitation.
<b>Pier 1 Tie Down</b>	Non-Destructive Testing including Ultrasonic Testing (NDT - UT) of tie-downs during CDI. SHM program to include thermal stresses due to seized bearing.	Continuous monitoring until decommissioning of the structure.  Bearing retrofit and/or replacement (if needed) based on SHM results.
<b>Load Sharing Disparity for Eye-bar Members</b>	Consider including a load sharing factor in the analysis of eye bar members.	Perform additional testing if required.
<b>Progressive Deterioration</b>	Increased focus on accurate determination of section loss using measurements including NDT (UT) as needed.	Predicted section loss is considered in the design of the 2023 rehabilitation. Corrosion protection measures at specific locations to be incorporated in the 2023 rehabilitation.
<b>Unforeseen / Unknown Concerns</b>	Perform pin analysis to determine if pin capacity could be a limiting factor.  Consider performing repeat scans (3D LiDAR) of critical members and locations to detect and monitor unwanted structural behaviours.	2023 Rehabilitation scope of work to be adapted as needed based on developments.  Project implementation method to allow for the performance of additional emergency interventions if required.



## Major repairs completed to date

Projects and maintenance works completed over the last 12 years have failed to bring the bridge back to a “fair” condition. In fact, inspection reports indicate that the rating continues to decrease even after having invested over \$80M in repairs and maintenance.

The structure has seen a considerable number of projects over its lifetime. Recently, there have been a significant and alarming increase in emergency interventions, mainly due to components deteriorating at a faster rate.

The bridge experienced reduced spending for repairs from 1995 to 2009. In 2009 the next round of major rehabilitation projects started and continues to present day. A further project is planned in the coming years to maintain the current reduced 27 tonne-capacity and repair the boardwalk until the planned replacement around 2028. Table 10-2 shows the amount of time the bridge was closed to complete the major repair projects.

List of major projects since 2008:

- 2009-10 – Center lane replacement and seismic retrofit
- 2014 – North trestle rehabilitation
- 2016-17 – Structural steel repairs – Pier 3
- 2019-20 – Structural steel repairs – Pier 2

Load posted

- 2018 – Boardwalk at 5 tonnes
- 2020 – Traffic lanes at 27 tonnes

**Table 10-2: Length of closures of the bridge from 2009 to 2021**

	Sum each year (in days)		
	Boardwalk (Reduction in access)	Centre Lane – Ottawa-bound	East Lane – Gatineau-bound
2009		133	115
2010		240	28
2011		3	9
2012		4	15
2013	2	22	38
2014	4	40	56
2015	27	8	38
2016	16	103	18
2017	30	172	37
2018	35	37	37
2019	6	20	22
2020	5.5	201.5	204.5
2021	3	180	180
<b>TOTAL</b>	<b>128.5</b>	<b>1,163.5</b>	<b>797.5</b>

### 10.1.2 Alternative Assessment - Removal of Crossing

The deconstruction of the Alexandra Bridge without replacing it was not an option that the Government of Canada deemed viable, especially considering the bridge’s significance, heritage value and integral role in interprovincial transportation and link between Ottawa and Gatineau.

The Alexandra Bridge is one of five interprovincial crossings in the NCR, where all the crossings are already at capacity during peak hours for motor vehicles. The Alexandra Bridge is also a key active mobility transportation corridor. If it were to be removed, not only would there be an increase in congestion for motor vehicles and transit (buses) on the other four crossings, but impacts would be significant for active mobility transportation users (e.g., pedestrians and cyclists) who would lose a key route for crossing the Ottawa River. As a result, active mobility transportation users would be impacted by additional time for commutes (up to 30 minutes detour for pedestrians, as heard from stakeholders in fall 2020 public consultation).

Removal of the crossing without replacement would have significant social and economic impacts. It is an option that was deemed unacceptable and was not considered further, consequently it is not included in the comparison analysis.

### 10.1.3 Alternative Assessment - Rehabilitation and Continual Maintenance

As highlighted in the LCCA report (WSP, 2018) the alternative of rehabilitating the existing structure was assessed. The rehabilitation option requires a significant scope of work to raise the existing structure to a rating of “fair” condition (rating of 4 on a scale of 1 to 6) within five years. Work would include the following:

- East and West side deck immediate repairs and replacement
- Expansion joint repairs (seals)
- Steel repairs
- Bearing replacement
- Complete bridge recoating
- Pier erosion protection
- Substructure masonry and abutment rehabilitation
- Barrier wall repairs
- Centre deck repairs/replacement

In the medium to longer term (about 10 to 25 years), work required to maintain the structure in a “fair” condition was projected to include:

- pin/eye bar retrofit
- steel repairs
- substructure masonry rehabilitation and pier erosion protection.

There are risks associated with future rehabilitation work as the extent required is not fully known. The risk for work required in the short term is lower, as the need and cost of repair can be determined more accurately. Over the long term however, the scope of work and costs associated with maintaining the bridge at a “fair” condition rating are more difficult to predict.

The East and West decks are in poor condition and require replacement within 5 years if the structure is to be maintained in perpetuity or if the replacement will not occur for more than ten years. However, if the replacement of the existing structure is to occur in 10 years, repairs to the existing East and West decks with some targeted partial rehabilitation could be carried out to prolong the life until replacement of the bridge. This delay in replacement of the East and West deck results in more annual maintenance until replacement of the structure occurs, but the large cost to replace the decks is avoided. Similar strategies can be applied to some of the structural steel repairs and the bearing replacement. If the existing structure is to be maintained in perpetuity or replaced in 15 or 25 years, a substructure masonry rehabilitation is required in year 5; however, if the existing structure is to be replaced in 10 years, this rehabilitation can be avoided.

### 10.1.4 Alternative Assessment - Replacement of Bridge

The location and significance of the existing Alexandra Bridge as a landmark, may require the replacement structure to have certain premium features incorporated, above and beyond that found on a typical bridge. The LCCA report (WSP, 2018) compares several replacement alternative concepts for new contemporary and signature bridges. The alternatives were evaluated and screened considering

several criteria using a weighted approach. This led to the selection of a contemporary alternative (slab-on-steel girder) and signature alternative (tied-arch structure), as well as a replacement-in-kind alternative (steel truss) being retained for concept development at a functional design level and for cost-estimating purposes. The retained alternatives were not meant for detail design and implementation at this stage but rather only to evaluate both the significance of the Alexandra Bridge within the nation's capital and the surrounding urban fabric and the merits of replacing the structure and to place future capital decisions in the context of a range of potential costs to the Crown.

With input from key stakeholders, namely the NCC, City of Ottawa, City of Gatineau, OC Transpo, the Société de Transport de l'Outaouais (STO) and PSPC representatives, conceptual design criteria and functional plans were developed for the alternatives of replacement in kind, contemporary and signature alternatives. Considerations included the context and fit with the surrounding urban fabric of the nation's capital, the approach roadways on the Ottawa and Gatineau sides, existing foundation and geotechnical conditions, local land ownership and usage as well as marine traffic. Functional needs for the Alexandra Bridge were decided to be maintained at existing levels and it was recommended to separate pedestrians and cyclists.

The LCCA provided cost comparisons between maintaining the bridge or replacing it. The analysis concluded that its replacement would be more economical than continuing to maintain the existing structure indefinitely and that it would present less risk to public safety.

### 10.1.5 Assessment of Alternatives to the Project

Many factors were considered to support the recommendation and decision to replace the bridge. Ensuring public safety over the long-term was a primary consideration in the decision.

The bridge currently has a rating of "inadequate" (rating of 2 on a scale of 1 to 6). For the bridge to be retained and maintained over the next 75 years, the rating would need to be increased to "fair" (rating of 4) within 5 years to achieve PSPC's standard for bridges.

Significant repairs over a 10-year period were foreseen to achieve the required standard. Because of the nature of the bridge construction, the extent of the repairs was not fully known but were anticipated to be costly and would require significant closures of the bridges to complete the work. Some repairs could also have impacted the heritage values of the bridge. Maintaining the bridge presented a high level of execution uncertainty and risk and could have required deconstruction of certain spans of the bridge to replace members. Thus, repairing the bridge was deemed an unacceptable alternative given the high level of risk and uncertainty in terms of time, cost, unknown complexity and whether even if repairs would indeed result in an improvement in the bridge rating following implementation.

Deloitte LLP (March 2022) was retained to analyze the socio-economic impacts associated with the closures of the Alexandra Bridge given two scenarios: "rehabilitation" or "replacement."

The socio-economic impacts were analyzed with respect to four categories:

- Transport user impacts (i.e., delays, vehicle operating costs, and health benefits for active transportation users);
- External impacts (i.e., air quality, environment, and road safety);
- Local business impacts (i.e., changes in revenues); and
- Economic impacts of the bridge closures (in terms of gross domestic product (“GDP”), labour income, and employment), based on changes in local business revenues.

Deloitte LLP (2022) developed initial capital cost estimates for each of the rehabilitation and replacement options utilizing estimates obtained from historical information on other similar bridge projects and then compared with parametric costs (i.e., costs per unit area).

Cost estimates factored in the location and significance of the Alexandra Bridge as a landmark and important element in the downtown core of the nation’s capital and also included specific requirements to meet Confederation Boulevard’s standards for streetscape amenities for pedestrians, bicycles and vehicular traffic. Cost estimates also included those associated with contingencies for costs, project management, engineering design, and risk.

Based on the cost estimates developed, indefinite maintenance of the existing structure was determined to be more costly over the next 75 years.

Table 10-3 provides a detailed comparison of the environmental, health, social, cultural, and economic effects of the alternatives.



**Table 10-3: Comparison of the environmental, health, social, cultural, and economic effects of various alternatives.**

Comparison of the effects of alternatives	Alternatives to Rehabilitation and Continual Maintenance	Replacement of Bridge
	<p>Closures of the Alexandra Bridge for maintenance and rehabilitation of the existing infrastructure, with no bridge replacement (the “<b>Rehabilitation Scenario</b>”).</p>	<p>Periodic closures of the bridge for maintenance over the years leading up to the bridge replacement, closure during the replacement, and periodic, shorter-lived closures thereafter (the “<b>Replacement Scenario</b>”).</p>
<p><b>Environmental</b></p>	<p><b>Air quality</b></p> <p>Increased GHG emissions from longer travel routes because of the need for detours due to longer closures (148 months between 2022 and 2056) based on the Deloitte LLP (2022) analysis.</p> <p>GHG emissions for rehabilitation projects were not estimated. The projected scope of work has a significant degree of uncertainty that limits estimates of GHG emission.</p>	<p><b>Air quality</b></p> <p>Increase in GHG emissions from longer travel routes during closure of the crossing for construction (80 months between 2022 and 2056) based on the Deloitte LLP (2022) analysis.</p> <p>Based on similar projects, GHG emissions were estimated from:</p> <ul style="list-style-type: none"> <li>• bridge deconstruction and construction (estimated to be 13,938 tCO<sub>2</sub>e and 22,025 tCO<sub>2</sub>e each)</li> <li>• transportation of debris for disposal (46.5 tCO<sub>2</sub>e)</li> <li>• fuel consumption in trucks/trailers used for transporting construction materials from</li> </ul>

Comparison of the effects of alternatives	Alternatives to Rehabilitation and Continual Maintenance	Replacement of Bridge
		<p>manufacturing locations to the construction site (139.5 tCO<sub>2</sub>e)</p> <ul style="list-style-type: none"> <li>fuel consumption in on-road vehicles for worker transportation to/from site (2,825 tCO<sub>2</sub>e).</li> </ul>
	<p><b>Water</b></p> <p><i>Stormwater/contamination management</i></p> <p>Much of the existing bridge deck is an open-grate deck and precipitation passes through the bridge deck unmanaged and untreated.</p>	<p><b>Water</b></p> <p><i>Stormwater/contamination management</i></p> <p>Paved decks increase the imperviousness of the structure and they are able to better capture, and control bridge runoff compared to the existing steel-grate deck. Where possible, the proposed bridge deck will also incorporate stormwater management features to direct runoff from the bridge surface to limit the potential contaminants from directly entering the Ottawa River.</p>
	<p><b>Noise</b></p> <p>Vehicle travel on the current steel bridge deck grating is very loud and impacts the enjoyment of the green spaces adjacent to the structure and for tour boat clients.</p>	<p><b>Noise</b></p> <p>There would be a reduction in the overall noise generated because the steel deck grating of the bridge will be replaced with a new closed-flat surface material.</p>

Comparison of the effects of alternatives	Alternatives to Rehabilitation and Continual Maintenance	Replacement of Bridge
<b>Human Health</b>	<p><b>Active Transportation</b></p> <p>During closure of the bridge, active transportation users may use alternate bridges for their travels, may shift to increase vehicle use, or may choose not to cross the river during the time of closures.</p> <p>Active transportation users who shift to one of the other bridges will travel over greater distances between their origins and intended destinations. Given the health benefit associated with increased physical activity, this subset of users will realize positive health impacts. Those who choose vehicle transport or avoid travel will experience adverse health impacts.</p> <p>The potential adverse impact is anticipated to be over a shorter period in this scenario because the boardwalk is expected to remain open for active transportation users while repairs take place.</p>	<p><b>Active Transportation</b></p> <p>Active transportation users may use alternate bridges for their travels, may shift to increase vehicle use, or may choose not to cross the river during the time of closures.</p> <p>Active transportation users could also shift, but the potential adverse impact will be over a longer period of since the bridge is closed for all users for a longer period.</p> <p>The new bridge is planned to provide improved active transportation facilities (wider area, improved deck surface, shallower grade) that could encourage greater active transportation mode selection for crossing the river.</p>
<b>Social</b>	<p><b>Closure of the bridge</b></p>	<p><b>Closure of the bridge</b></p> <p>The two vehicle lanes and the boardwalk are expected to be continuously closed from June 2028 to May 2032 (<b>46 months</b>) for bridge</p>

Comparison of the effects of alternatives	Alternatives to Rehabilitation and Continual Maintenance	Replacement of Bridge
	<p>Bridge closures in the last 5 years have caused significant disruption to access the bridge for vehicular users.</p> <p>The two vehicle lanes are expected to be continuously closed from April 2023 to November 2027 (<b>54 months</b>) for major rehabilitation work with the boardwalk closed as well for 34 months during that period. It would be periodically closed for <b>94 months</b> through to 2056, <b>This represents a total of 148 months between 2022 and 2056.</b> (Deloitte LLP, March 2022)</p>	<p>replacement, and otherwise periodically closed for <b>34 months</b> through to 2056. <b>This represents a total of 80 months between 2022 and 2056.</b> (Deloitte LLP, March 2022)</p>
<p><b>Cultural</b></p>	<p><b>Heritage</b></p> <p>Maintaining the bridge would require strengthening or replacement of character defining members such as eye-bars and pins which would significantly impact these heritage features.</p>	<p><b>Heritage</b></p> <p>Replacement of the bridge will result in the loss of the historic structure. A Heritage Impact Analysis (HIA) is planned to help inform the conservation decision-making process by assessing the value of the Alexandra Bridge within its broader cultural landscape setting, and providing a comprehensive understanding of the heritage value and character-defining elements unique to the structure and its cultural landscape setting.</p>

Comparison of the effects of alternatives	Alternatives to Rehabilitation and Continual Maintenance	Replacement of Bridge
		The design of the new bridge will build upon the existing bridge's legacy by achieving its own distinctive stature, realized in a way that is sensitive to the unique heritage context of the Ottawa River Corridor Cultural Landscape.
<b>Economic</b>	LCCA (2018) \$650,400,000	LCCA (2018) \$450,700,000
	<p>Based on the Deloitte LLP (2022) analysis, the costs of trying to maintain the bridge would be more than a replacement bridge and the schedule would be much longer than building a new bridge (68 months longer).</p> <p>Extensive and costly mitigation measures were established to ensure that the bridge remains safe for public use. Mitigation measures include:</p> <ul style="list-style-type: none"> <li>• Installation of a Structural Health Monitoring (SHM) System intended to provide notification due to change in loading condition and trends; alarms for pre-determined thresholds; and, better understanding of the impacts on bridge</li> </ul>	

Comparison of the effects of alternatives	Alternatives to Rehabilitation and Continual Maintenance	Replacement of Bridge
	<p>members due to the improper bridge articulation.</p> <ul style="list-style-type: none"> <li>• More frequent Comprehensive Detailed Inspections (CDI)</li> <li>• Traffic lanes load reduction to 27 tonnes (prevents use by heavy vehicles)</li> </ul>	
	<p><b>Local Businesses</b></p> <p>It is estimated that there will be a gross impact revenue loss for local businesses equal to <b>\$130.9 million</b> over the evaluation period of 2022 to 2056 (in present value terms).</p> <p>These revenue losses could result in adverse impacts on local economic activity. Under this scenario, it is estimated that the business revenue losses could place \$75.9 million of GDP in the local economy at risk (of which \$57.0 million is labour income) and place an annual average of roughly 75 jobs at risk (Deloitte LLP, March 2022).</p>	<p><b>Local Businesses</b></p> <p>It is estimated that there will be a gross impact revenue loss for local businesses equal to <b>\$98.8 million</b> over the evaluation period of 2022 to 2056 (in present value terms).</p> <p>Under the Replacement Scenario, it is estimated that the business revenue losses could place \$57.3 million of GDP in the local economy at risk (of which \$43.0 million is labour income) and place an annual average of roughly 50 jobs at risk (Deloitte LLP, March 2022).</p>

## 10.2 Alternative Means to Project Execution

Alternative means to carrying out the Project are currently being discussed, investigated and considered by the IPT and key stakeholders/partners. At the time of writing, many high-level design decisions relating to the alignment as well as the number and length of spans are still to be determined, which have a direct impact on the means of executing the Project.

### 10.2.1 Alternative Bridge Alignment

An important aspect under review is how to deconstruct the existing bridge and rebuild a new one. Design, engineering, environmental, social, and economic impacts will affect the selection of the approach. There are also constraints that need to be considered in the analysis including reducing the amount of time that the bridge will be offline to all users, managing the complexity and time associated with deconstruction and construction activities occurring simultaneously. In addition, views protection, including views of the Parliamentary and Judicial precincts from the bridge and the shorelines, as well as maintaining public spaces and navigation opportunities will be important considerations. Planning and Design Principles were developed to establish a framework for future design development (refer to [Appendix G](#)). Stantec was retained to complete schematic analysis (Stantec 2021a) to initiate concept work. These, along with planned Decision Criteria will provide a structured approach to the decision-making process.

A proposed approach, which is under consideration, is to possibly “partially-twin” the new bridge during construction (refer to Figure 10-17). This would involve starting construction of the new bridge while the existing Alexandra Bridge is still in operation to some degree. A complete twinning is not feasible due to existing infrastructure or abrupt land features in Ottawa and Gatineau that prevent construction of new distinct approaches. Potential impacts of this approach would include longer project timelines, increase in project costs, and possible different alignment for the new bridge (“curved alignment” as opposed to “straight alignment”). Potential benefits might include less impacts to commuters if the crossing was out of service for a shorter period since the existing bridge could remain in service longer at the start of construction activities.





**Figure 10-17: Conceptual drawing of a bridge following a curved alignment**



**Figure 10-18: Conceptual drawing of a new bridge in the same location as existing (straight alignment)**

A different approach, required if the existing “straight” alignment is used for the new bridge shown in Figure 10-18, would be to partially or completely deconstruct the existing bridge before starting construction on the new one. Potential impacts would include the length of time that the crossing is not available to any of its current users. Potential benefits of this approach would be that the new structure would use nearly the same alignment as the existing bridge which would reduce the overall footprint of the Project (“straight” alignment) and lessen the overall construction time and cost.



## 10.3 Planning and Design Principles

Technical and background studies undertaken in 2019 and 2020 led to the development of a set of preliminary Planning and Design Principles (NCC, 2021) for the Project.

In 2020, the preliminary Planning and Design Principles for the Project were presented for consideration and comment to NCC's ACPDR and ACUA as part of the regulatory approval process under FLUDTA. The Planning and Design Principles were developed to articulate the Vision for a "signature" bridge in the Nation's capital and to establish a framework for future design development. This included the preliminary development of several concepts for consideration by the Project team for further investigation and study.

In June 2021, the Planning and Design Principles were presented to the Board of Directors of the NCC where they received Approval. Recommendations that were Approved included:

- *That the Federal Design Approval for the document entitled Planning and Design Principles for the Alexandra Bridge Replacement be granted, pursuant to Section 12 of the National Capital Act, subject to the following conditions:*
  - *That future stages of the ABR Project be subject to separate federal review and approval processes (Level 3).*
  - *That minor amendments to the document, if required, be delegated to NCC staff for review and approval.*
  - *That the preparation and signature of the Federal Design Approval document for the Planning and Design Principles for the Alexandra Bridge Replacement be delegated to the Vice President, Capital Planning Branch.*

Further, Condition 3.1 of the Federal Approval letter (2021) for the Alexandra Bridge Replacement - Planning and Design Principles requires that the NCC will provide performance criteria to the Proponent, which will form the basis of the NCC's review and evaluation of designs for the replacement bridge in future stages of approval.

The Planning and Design Principles for the Project (see Appendix G) have been developed to provide future bridge designers and engineers with concrete considerations and directives to integrate within new bridge designs. These site-specific guidelines consider applicable federal and municipal plans, policies and guidelines given that the bridge is a national landmark and a significant connection between the municipalities of Ottawa and Gatineau.

The Planning and Design Principles set the foundation for bridge and urban design considerations given the complexity of the surrounding cultural and heritage context. Nearby sites of historical and cultural significance include National Historic Sites of Canada (the Parliamentary Precinct and Rideau Canal, which is also a UNESCO World Heritage Site), the National Gallery of Canada, the Canadian Museum of History, Kiweki Point (formerly named Nepean Point), Major's Hill Park, Jacques-Cartier Park, as well as the natural elements of the Ottawa River shoreline. The site-specific Planning and Design Principles will focus possibilities by providing a concise set of parameters that may also be used for the purposes of evaluation of future new bridge designs.

The Mission Statement that underlies the development of the Planning and Design Principles for the replacement of the Alexandra Bridge was defined as:

*To create a sustainable interprovincial transportation connection that will prioritize active mobility and highlight the symbolic importance of the site to all Canadians for many generations to come.*

Some of the key considerations of the Planning and Design Principles include the functional design requirements of the bridge, applicable NCC Plans and policies, and the protection and honouring of national values and interests, such as the Central Capital Landscape and Confederation Boulevard.

The vision for the Project recognizes that, just as the existing bridge has for the past 120 years, the new bridge will strongly become a representation of the identity of its place defined by its architectural, urban and structural character.

Based on this Mission Statement, the overall Vision that will be used to guide the design process throughout the Project is as follows:

*Creating an emblematic bridge in the form of an exceptional civic site that reflects Canada's national identity and values, while respecting the integrity of the cultural landscape of the capital.*

The Planning and Design Principles are organized under six broad categories including:

*(1) Mobility and Continuity of the Urban Fabric*

- This set of guidelines provides direction for the integration of the replacement bridge within the Confederation Boulevard ceremonial route and the importance of creating better active mobility network connections both across the river, but also between the new bridge and the shorelines. It emphasizes the importance of safe and comfortable active mobility, with pedestrians having priority, in line with the NCC's Confederation Boulevard design guidelines.

*(2) Public Spaces and Civic Experiences*

- These guidelines support the consideration of the function of the bridge as a key part of the core area sector of the capital, connecting major urban parks but also being a civic space in its own right for residents and visitors alike to appreciate views of the national symbols.

*(3) Structure, Height, Proportions and Lighting*

- This set of guidelines necessitate the integration of the bridge within the cultural landscape and the overall design of the core area sector, through consideration of the bridge's structural composition and lighting. The intent is for the bridge to complement and be sensitively inserted into the landscape, so as to be an iconic structure without overpowering the landscape's natural features and the pre-eminence of the national symbols, such as the Parliamentary triad.

#### *(4) Preserve Views and Celebrating the Legacy*

- These guidelines highlight the importance of the cultural and historical context the new bridge must reflect, including enabling indigenous participation in the Project and design, honouring the legacy of the existing Alexandra Bridge, and ensuring appropriate integration into the cultural landscape. Special attention is given to the question of views protection, including views of the Parliamentary and Judicial precincts from the bridge and the shorelines.

#### *(5) Sustainability and Materiality*

- These guidelines call for the bridge design to achieve excellence in terms of sustainability, and in particular, protection and enhancement of natural features of the Ottawa river and its shoreline. Materials selection, ensuring ease of operations and maintenance, and designing for the local climate are also highlighted as key features of importance for a sustainable bridge.

#### *(6) Universal Accessibility, Legibility and Wayfinding*

- This section highlights the importance of considering accessibility right from the outset in designing the bridge, and of integrating detailed elements such as road signs and supports for interpretive features within the bridge design, while also being compatible with the system used for Confederation Boulevard and the capital pathway network.

### **10.3.1 Design Elements to be Considered for Sustainability**

The Project shall aim for the highest certifications and standards in terms of sustainable development, including following the directions of PSPC's Departmental Sustainable Development Strategy: 2020 to 2023 and NCC's Sustainable Development Strategy, 2018-2023 as well as future revised strategies. Long-term sustainability of the new bridge is a key consideration in the future assessment of alternative means to complete the replacement Project, with the Planning and Design Principles recommending the use of active and passive sustainability strategies, as well as ensuring a response to the sustainable development goals of the 2030 United Nations Agenda for Sustainable Development. Emphasis will be placed on low carbon material choices and the total cost of the materials (economic and environmental).

The IPT will be using the Envision framework to guide the Project. Envision is a framework that provides a consistent, consensus-based approach for assessing sustainability, resiliency, and equity in civil infrastructure. The IPT will use Envision's flexible system of criteria and performance objectives to help identify sustainable, resilient, and equitable approaches during the planning, design, and construction. This approach will continue throughout the Project's operations, maintenance, and end-of-life phases. A key aspect of the framework consists developing infrastructure that considers climate change, addresses public health needs, cultivates environmental justice, creates jobs, and spurs economic recovery.

Additional guiding principles that will need to be considered in the design specifications to ensure sustainability are listed below:

### ***Choice of Materials***

Concrete: Changes to the concrete mixing formula, addition of adjuvants and cement additives, addition of entrained air, choice of concrete constituents to avoid alkali-aggregate reaction formation, laboratory tests to ensure flaking resistance, etc.

Steel: Three-layer paint system should be considered: a zinc-based primer, a second base layer with epoxide resin and a urethane finish layer. All layers must be applied in the factory. Each layer must have a different color and the last layer should be a light color to make it easier to inspect the surfaces.

### ***Replaceable Elements***

The structure consists of replaceable and non-replaceable elements. Examples of non-replaceable elements are foundations, stakes, piers, rafters, abutments, retaining walls, pylon and mats, main arches. The other elements of the bridge are replaceable elements, with a minimum lifespan per element to be defined. The overall lifespan of the structure will be defined by the choice of materials for the irreplaceable elements with a perspective of 100 years or more.

### ***Drainage and Waterproofing***

Considerations will include: requirements for the drainage system (pipes, accessibility for cleaning, location of sumps); requirements for the waterproofing membrane of the deck and the protective coatings of the elements exposed to de-icing salts; requirements for waterproofing of the apron expansion joints; and, requirements for de-icing agents and products.

### ***Access and Inspection***

Considerations will include: structure design requirements for access to be taken into account for inspection and maintenance; special requirements for access to batteries, pylons, casings and braces; special requirements for lifting and replacing support devices; special requirements for the removal and replacement of cables, anchors and shock absorbers, and expansion joints; and, requirements for space, lighting, evacuation, ramps and evacuation and communication systems inside enclosed spaces.

### ***Instrumentation and Monitoring***

Considerations will include: installing an instrumentation system on the structure which could be comprised of deformation and movement sensors, accelerometers, inclinometers, anemometers, temperature sensors, hygrometers and acquisition of instrumentation data, analysis and interpretation of data for bridge maintenance management.

### ***Additional Measures to be Considered***

The following measures will also be considered in the replacement bridge design:

**Anti-vandalism protection:** Iconic bridges are often the target of vandalism. To protect sensitive elements, it will be necessary to consider protection systems and block access to these elements.

**Cables and Cable Technology:** Consider several emblematic bridges, for example bow-string bridges, extra-dosed, suspended or a variation of these types. In all these cases, cable carriers and cables are needed to transport the loads to the supporting elements of the structure. Over the past several decades, cable technology has evolved to take into account problems observed in several cable bridges: fatigue failure, excessive vibration, low fire resistance, vulnerability to attacks, corrosion of cables and anchors, among others.

**Ice and ice charges on cables:** Cable bridges in winter climates are exposed to bad weather and the action of very low temperatures, ice and snow, and strong winds combined with freezing rain. The new bridge design must be resilient towards exceptional climate events to be faced in years to come, as well as the unique microclimate of the Ottawa River Valley. Options for consideration could include a combination of physical measures/systems (ex: ribs on cable to avoid formation of large pieces of ice) and operational measures/systems (removing ice on cable, closing lanes in dangerous situations, etc.) to further address potential risks.

### **10.3.2 Significant Influence on Design Alternatives**

Six (6) projects or /plans in various stages of completion (under study, approved or under construction) near or applicable to the Project are described below. These Projects could provide opportunities to fit with the vision for the new bridge.

#### ***10.3.2.1 Ecological Demolition Project at Kìwekì Point (formerly named Nepean Point) and Site Redevelopment***

One of the first initiatives of the Kìwekì Point (formerly named Nepean Point) redevelopment Project is the removal of the outdoor amphitheater, which began in 2019. The redevelopment of the site itself is to be completed by 2023 and follows a national design competition launched by the NCC. The Project aims to enhance the landscape experience of the capital while enhancing the link with the Ottawa River and facilitating universal accessibility to the site. No real impact on the bridge replacement Project is anticipated other than its planned connection to Major's Hill Park.

#### ***10.3.2.2 Pedestrian Bridge between Major's Hill Park and Kìwekì Point (formerly named Nepean Point)***

Pìdàban Bridge, between Major's Hill Park and the Kìwekì Point (formerly named Nepean Point) site is part of the overall vision of the redevelopment Project. This bridge will facilitate pedestrian access between these two (2) public spaces and make this highly sought-after link safer. This pedestrian link has a direct impact on the redevelopment of the Ottawa approach as the free height under the Pìdàban Bridge will be 5.3 m.

### **10.3.2.3 Study for a Rail Transit Loop System**

A study was completed (Parsons, 2020) to assess the feasibility and appropriateness of a looped rail transit system that uses the Portage and Alexandra Bridges is under consideration. It should be noted that the future route of a Light Rail System (LRT) or tramway could have an impact on road geometry in terms of approaches on both (2) banks.

### **10.3.2.4 Rideau Canal to Rideau Falls Waterfront Promenade**

The proposed development of a new trail along the south shore of the Ottawa River between Rideau Falls and the Rideau Canal is being planned by the NCC. The long-term vision is to create a multi-use connection between the Ottawa River pathway at the Rideau Canal locks eastward toward Rideau Falls via Lady Grey Drive, connecting existing public spaces overlooking the Ottawa River to the east of the canal. This future pathway (Rideau to Rideau Trail) will need to be coordinated with the bridge replacement Project.

### **10.3.2.5 Ottawa River North Shore Parklands Plan**

The Plan guides future development decisions based on a long-term vision and initiatives for federal lands in the Capital core area that run along the periphery of Hull Island in Gatineau. To achieve the vision, it proposes land uses and guidelines for federal lands that run along the periphery of Hull Island in Gatineau, between the Ottawa River and Laurier Street and those along Ruisseau de la Brasserie (Brewery Creek) including site-specific directions for Jacques-Cartier Park and the Canadian Museum of History. The plan will also serve as a decision-making tool for federal approvals regarding land use, design, and real estate transactions.

### **10.3.2.6 Long Term Integrated Interprovincial Crossings Plan**

The NCC's Long-Term Integrated Interprovincial Crossings Plan for the National Capital Region: A Strategic Plan for Interprovincial Crossings and Sustainable Transportation for the National Capital Region (NCC, 2022b) sets out a vision for the interprovincial movement of people and goods in the NCR today and towards 2050. It includes key directions, strategies and initiatives to help the region achieve common goals and objectives along with a monitoring framework to measure qualitative and quantitative monitoring indicators and targets over the short, medium and long terms. Its purpose is to inform interprovincial decisions in ways that are sustainable, equitable and environmentally sensitive that work towards creating a more liveable and prosperous region.

## **10.4 Performance Criteria for Bridge Design**

Given that the Project is located within the NCR, the Project is also subject to the FLUDTA administered by the NCC under the *National Capital Act*. The FLUDTA process will include multiple rounds of review and approval, corresponding to the various stages of planning as well as design and construction of the Project. All stages of the Alexandra Bridge Replacement Project are classed as Level 3 Project, the highest-level classification for Federal Approvals. Level 3 Projects are subject to a comprehensive land use and design review, with input from the NCC's ACPDR and ACUA, as part of the federal approval process.

Alexandra Bridge Replacement Performance Criteria for Bridge Design (NCC, 2022a) (see Appendix G) articulates the NCC planning and design requirements and expectations associated with the Project. Any new bridge design put forward for Federal Approval under section 12 of the *National Capital Act* will be assessed by the NCC against these criteria and other factors, such as the input received through public consultation and Indigenous and stakeholder engagement. A design proposal must, at minimum, meet the requirements of the performance criteria to be recommended to the NCC Board of Directors for approval.

The purpose of the Performance Criteria is to guide the Proponent (the IPT) throughout the design and decision-making process by providing transparency and predictability of NCC expectations for a successful Federal Approval.

The performance criteria summarize the NCC’s Capital Interests that apply to the project, consistent with the NCC’s mandate, plans, policies, guidelines and the Alexandra Bridge Planning and Design Principles approved by the NCC Board of Directors in 2021. The criteria are to be read by the Proponent including their consultants and contractors in conjunction with all applicable federal, provincial, and municipal plans and regulations as well as project-specific studies, field investigations, and analyses. The NCC also expects that the Proponent will undertake public, stakeholder and Indigenous engagement and demonstrate that input from these parties and project partners was considered in the design of the new bridge.

A design proposal must, at minimum, meet the requirements of the performance criteria to be recommended to the NCC Board of Directors for approval. All criteria are mandatory. The shaded boxes presented in Table 10-4 represent key evaluation criteria that will be used to compare different options at the concept design stage. Table 10-4 provides a checklist of the criteria that have been assigned to be mandatory, which means they must be met for the Project to be approved under the FLUDTA process.

**Table 10-4: Overall design performance criteria checklist**

Shaded boxes represent key evaluation criteria for comparing different options at the concept design stage.

1.0 Urban Design Framework				✓
1.1 Heritage, Archaeology & Cultural Landscape	UD1	UD1a	Visual Integrity	
		UD1b	Central Capital Landscape	
		UD1c	Re-use of Materials	
		UD1d	Integrate with Shoreline	
		UD1e	Protect Archaeological Resources	
		UD1f	Manage Archaeological Resources	
1.2 Indigenous Culture	UD2	UD2a	Indigenous Perspectives	
1.3 Confederation Boulevard	UD3	UD3a	Confed Blvd Guiding Principles	
		UD3b	Grand Esplanade	
		UD3c	Streetscape Elements	
		UD3d	Laurier/Allumettieres Node	

<b>1.0 Urban Design Framework</b>				✓	
1.4	Natural Environment	UD4	UD4a	Ottawa River Corridor	
			UD4b	Species Inventory & Habitat	
			UD4c	Native Vegetation	
1.5	Climate & Microclimate	UD5	UD5a	Designed to Last 125 Years	
			UD5b	Withstand Storm Events	
			UD5c	Impacts during Storm Events	
			UD5d	Sustainable Solutions	
			UD5e	Moderate Microclimate Extremes	
<b>2.0 Public Space</b>				✓	
2.1	Mobility	PS1	PS1a	Active Mobility	
			PS1b	Pedestrian Through-Route	
			PS1c	Bi-Directional Cycleway	
			PS1d	Roadway	
			PS1e	Laurier/Allumettieres Intersection	
2.2	Public Space & User Experience	PS2	PS2a	Public Space Amenity	
			PS2b	Supplementary Design Elements	
			PS2c	Integrate Infrastructure	
			PS2d	Boast User Experience	
2.3	Shoreline Connectivity	PS3	PS3a	New Pathways	
			PS3b	North Abutment	
			PS3c	South Abutment	
			PS3d	Shoreline Pathway Landscape	
2.4	Universal Accessibility & Inclusivity	PS4	PS4a	Universal Access	
			PS4b	Regulation Compliance	



<b>3.0 Bridge Expression</b>				✓	
3.1	General Arrangement	BE1	BE1a	Plan Configuration	
			BE1b	Elevation	
			BE1c	Cross Section	
			BE1d	Navigation Channel	
3.2	Visual Form & Image	BE2	BE2a	Legacy & Landmark	
			BE2b	Unique and Meaningful	
			BE2c	Respond to Place	
			BE2d	In-Scale with Surroundings	
			BE2e	Viewing Experience	
3.3	Design Excellence	BE3	BE3a	Excellence	
			BE3b	Timeless Visual Effect	
			BE3c	Bridge Detailing	
			BE3d	Secondary Elements	
			BE3e	Crash-Tested Barriers	
			BE3f	Abutments	
3.4	Materials & Finishes	BE4	BE4a	Honour Capital Palette	
			BE4b	Materials & Finishes	
3.5	Lighting	BE5	BE5a	Integrate within Landscape	
			BE5b	New Lighting Aesthetics	
			BE5c	Light Fixture Performance	
<b>4.0 Views &amp; Visual Experience</b>				✓	
4.1	Views Protection	VA1	VA1a	Viewpoint #6	
			VA1b	Preserve Viewsheds	
			VA1c	Minimize Visual Intrusions	
4.2	Views towards the Bridge	VA2	VA2a	Selected Viewpoints	
4.3	Spatial Sequence	VA3	VA3a	Enhanced Spatial Sequence	
<b>5.0 Other NCC Standards &amp; Requirements</b>				✓	
	ON1	ON1a	Criteria Updates/Other Factors		

## 11 PROJECT ACTIVITIES

This section provides an overview of all activities, infrastructure, permanent or temporary structures and physical works associated with the deconstruction, construction and operation as part of the Project.

A Project of this scope and size requires a minimum practical construction area as well as several staging or mobilization sites. Specific construction conditions are not known at this stage of the Project. Generally expected activities associated with the Project include the organization of the site, the deconstruction of the existing bridge, and the construction of the new bridge. Many factors will be considered in the development of associated infrastructure and the selection of temporary facilities to support construction and deconstruction activities.

Criteria to support the decision-making process may include such categories as:

- **Technical considerations** such as the limited available options for staging areas near the bridge, the general vicinity of staging areas to reduce transportation and barging of materials or conditions of use of certain areas to mitigate potential impacts (such as contamination)
- **Socio-economic considerations** such as impact to key partners and stakeholders operating in the area (e. g. wharf tenants, small businesses, museum, municipalities, park users, etc.)
- **Environmental considerations** such as proximity to the river and impact to other resources such as heritage or archeological features
- **Level of reversibility of all impacts**

Areas immediately adjacent to the bridge which could be impacted by construction activities include Jacques-Cartier Park and the Canadian Museum of History on the Gatineau side as well as Kìweki Point (formerly named Nepean Point) and Majors' Hill Park on the Ottawa side. These public spaces support activities of social and economic importance that may be displaced during construction and deconstruction activities to ensure public safety. Consideration for temporary relocation of the infrastructure associated with these activities are included in this section.

## 11.1 Organization of Sites for Deconstruction and Construction

Temporary facilities will be required to properly organize the site for the Project. Given the urban setting of the Project and limited availability of staging areas near the bridge, several sites are likely to be required in the general vicinity to provide sufficient space for trailers, laydown area and parking for construction equipment.

Staging locations have not yet been confirmed, as they will be carefully evaluated to avoid, limit, or reduce any impacts on areas proposed.

### Staging or Laydown Site Preparation

The first steps in the organization of the site (s) may include:

- The delimitation of the sites, involving the installation of security fences around their perimeter
- Installation of vegetation protection and environmental protection measures
- The installation of a geotextile and granular pad over grassed areas, and construction of access roads
- Installation of construction trailers, mobilization of tools and equipment
- Temporary connection to the electrical grid, installation of exterior site lighting
- Construction of a temporary causeway if required
- Installation of temporary toilets and supply of water

### Types of Staging and Laydown Areas

Operationally, there are three (3) types of staging areas required to build a bridge over a river and if possible, they would be located on both approaches as the construction could simultaneously progress from both approaches towards the middle of bridge to reduce the time that the structure is closed to public use.

1. **River Staging Area:** River Staging Areas front directly on the river, have adequate draft for barges moving back and forth to dock(s), staging and laydown areas. The principal function is to provide temporary storage and preparation of bridge components that may have been fabricated elsewhere prior to installation. They also provide a base for vessels, while in-river crews and associated engineering as well as management oversight functions can be located there as well.
2. **Bridge Staging Areas:** Bridge Staging Areas are docks to support the transfer of crews and material (concrete particularly) to the work vessels supporting the in-river construction. They are work site for preparation of construction elements, such as rebar cages, and are areas to provide vehicle circulation and fabrication at each shore.

3. **Inland Staging Areas:** Inland Staging Areas are large enough to accommodate the supporting services and operations necessary to construct the bridge. These include concrete batch plants, materials storage including petroleum products, tool containers and the deconstruction materials, and laydown areas. Construction trailers could be required to accommodate the crew and contractor's facilities, administrative and support facilities, construction supervision teams, the owner's engineer and parking. A significant workforce could be working at times on the Project, requiring transportation arrangements such as shuttle services, to access the site.

Just as it is more practical for some components to arrive and move by water, it is also more practical for other components to be trucked in, stored, prepared and then brought to the site either by way of transfer at the bridge staging areas, or directly to the point of construction by way of already completed superstructure. This may include concrete from an on-site batch plant, roadway deck for long span structures, and conceivably even short span superstructure segments for gantry erection. The Inland Staging Areas will be used to house the following five types of temporary construction and administrative facilities:

- Concrete batch plant
- Temporary storage otherwise referred to as a laydown area
- Office space for administration and engineering staff
- Parking for all office and construction staff for all required heavy machinery and equipment
- Site services including fueling, waste management, utilities and security

These laydown and staging facilities will be dismantled at the end of the Project at which time the sites will be restored. This may include cleaning, disposal of granular materials, placement of fill, levelling, and landscaping as well as any other necessary reinstatement measures.

The Project will require the mobilization of heavy machinery. The main equipment likely to be required for the work are excavators, backhoes, bulldozers, cranes, skyjacks, boats, barges, caisson installation equipment, concrete pump, trucks, sheet pile installation equipment, generators, and dewatering pumps.

## 11.2 Deconstruction of the Existing Alexandra Bridge

During the execution of this Project, the existing Alexandra Bridge will be deconstructed. It will be the responsibility of the selected contractor to define the deconstruction methodology. General process steps include:

- Removal of east and west cantilevered decks
- Removal of concrete deck on main span
- Deconstruction of main span
- Removal of deck on Trusses A&B
- Deconstruction of Trusses A&B
- Removal of deck on Hull and Ottawa Trestles
- Deconstruction of trestles
- Deconstruction of in-water piers down to 1m above riverbed
- Deconstruction of piers on ground to 1m below ground level, placement of fill
- Deconstruction of Gatineau abutment to 1m below ground level, placement of fill
- Deconstruction of Ottawa abutment to bedrock
- Removal of Gatineau approach material, as required
- Separation of materials: steel, concrete, rock, fill, pavement, electrical components
- Recuperation / salvage of components for possible repurposing (universities, museums, monuments, etc.)
- Shipment of materials to recovery or disposal sites

The method will have to comply with the specified mitigation measures and will be validated by the contract administration and construction supervision teams.

### 11.2.1 Alternative Deconstruction and Construction Activity Sequencing

The two alignments, straight and curved, were considered in the development of deconstruction scenarios for the existing bridge. The deconstruction sequence for each case attempts to minimize:

- the traffic disruption time and the total duration of the work
- complexity of the deconstruction process
- the ease of constructing the new approaches
- accessibility to the navigation channel.

This is based on the areas of overlap between the deconstruction activities and the conceptual construction of the new bridge.

Unlike the curved alignment, the overlap area for the straight alignment completely covers the existing bridge. Given the geometry of the two proposed alignments, the overlapping areas will need to be cleared:

- So that construction of the new bridge can start in the straight alignment
- So that construction of the new bridge can progress in the curved alignment.

These are conceptual scenarios for consideration by designers in developing a feasible and efficient deconstruction sequence which will be essential to facilitate the new construction. Other deconstruction options may be explored and or implemented.

### 11.2.1.1 Deconstruction Options – Curved Alignment

#### 11.2.1.1.1 Step “0” deconstruction

The existing Alexandra Bridge was originally built-in sequence which suggests an approach for the deconstruction. While developing potential deconstruction alternatives, it was found that the east and west cantilever tracks can be dismantled as required to reduce the weight of the structure itself. In addition, the concrete deck and parapet walls in the central lane can also be removed, if necessary. This part of the removal, shown in the Figure 11-1, is proposed as step “0” of the deconstruction for both alignment options.

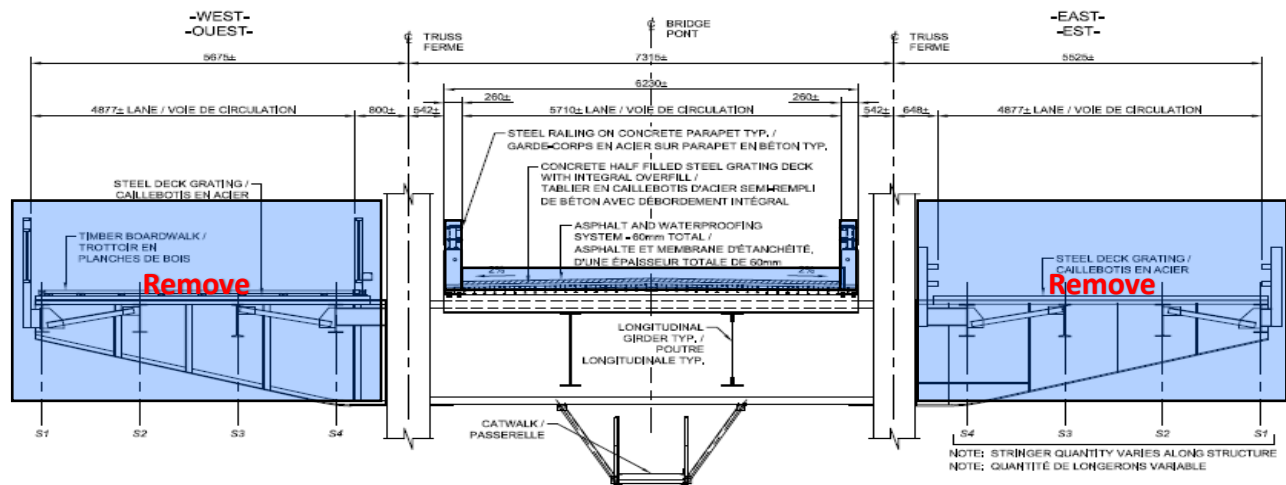
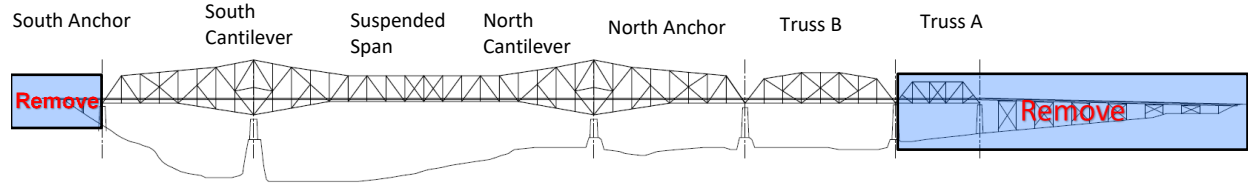


Figure 11-1: Step “0” of deconstruction – curved and straight alignments

### 11.2.1.1.3 Step 1 Deconstruction

The North and South trestle spans and the 'A' truss can be removed by crane from ground level or from a temporary platform without the use of barges. The removal of these spans can take place prior to the deconstruction of the main truss span as illustrated in Figure 11-2.



**Figure 11-2: Step 1 deconstruction– curved alignment**

### 11.2.1.1.4 Step 2 Deconstruction

Removal of the remaining main truss spans is proposed as the step 2 deconstruction. There are options related to the order in which the sequence of deconstruction is completed, each have different impacts on timing, cost, and navigation. Table 11-1 provides a comparison of the advantages and disadvantages of four separate options for this Step.

**Table 11-1: Comparison of options for deconstruction – curved alignment**

Option	Deconstruction Sequence	Advantages	Disadvantages
<b>Option 1</b>	<ol style="list-style-type: none"> <li>1. Suspended span</li> <li>2. B-truss</li> <li>3. North and South cantilever spans</li> <li>4. North and South anchor spans</li> </ol>	<ul style="list-style-type: none"> <li>• The original construction sequence of the Alexandra Bridge is reversed.</li> <li>• Least complex deconstruction.</li> <li>• Less impact on navigation. The navigation channel could remain under the suspended span with a clearance of 60 m x 11 m.</li> </ul>	<ul style="list-style-type: none"> <li>• Longest period of traffic closure.</li> <li>• Construction of new bridge approaches delayed.</li> <li>• Slightly higher deconstruction cost than option 2.</li> </ul>
<b>Option 2</b>	<ol style="list-style-type: none"> <li>1. Suspended span</li> <li>2. South anchor span, South cantilever span, B-truss</li> <li>3. North cantilever span, North anchor span</li> </ol>	<ul style="list-style-type: none"> <li>• Moderate deconstruction complexity.</li> <li>• Most efficient construction of new bridge approaches.</li> <li>• Shortest traffic closure time.</li> <li>• Lowest deconstruction cost.</li> </ul>	<ul style="list-style-type: none"> <li>• Navigation channel more difficult to maintain than option 1.</li> </ul>

Option	Deconstruction Sequence	Advantages	Disadvantages
<b>Option 3</b>	<ol style="list-style-type: none"> <li>1. South anchor span partially</li> <li>2. South cantilever span, B-truss</li> <li>3. South anchor span remaining portion</li> <li>4. South cantilever span</li> <li>5. North cantilever span North anchor span</li> </ol>	<ul style="list-style-type: none"> <li>• Moderate deconstruction complexity.</li> <li>• Shortest time for traffic closure.</li> <li>• Less impact on navigation.</li> </ul>	<ul style="list-style-type: none"> <li>• Highest deconstruction cost.</li> <li>• Construction of new bridge approaches less efficient than option 2.</li> </ul>
<b>Option 4</b>	<ol style="list-style-type: none"> <li>1. South anchor span</li> <li>2. Suspended span</li> <li>3. South cantilever span</li> <li>4. B-truss</li> <li>5. North cantilever span</li> <li>6. North anchor span</li> </ol>	<ul style="list-style-type: none"> <li>• Construction of new bridge approaches can begin early.</li> <li>• Shorter duration of traffic closure.</li> </ul>	<ul style="list-style-type: none"> <li>• The most complex deconstruction.</li> <li>• Most difficult to maintain navigation options.</li> <li>• Slightly higher deconstruction cost than option 2.</li> </ul>

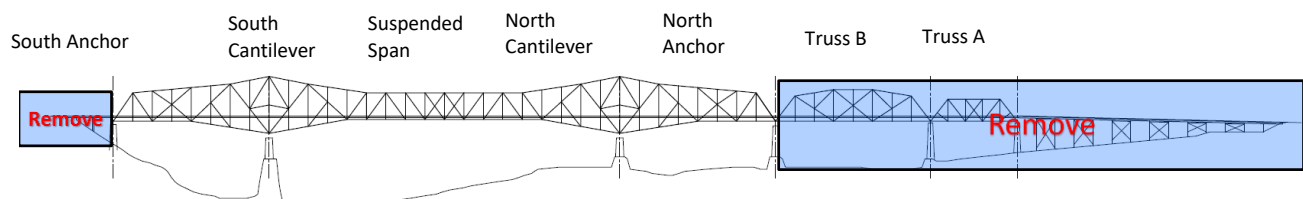
### 11.2.1.2 Deconstruction options – straight alignment

#### 11.2.1.2.1 Step “0” deconstruction

Step 0 of deconstruction for the straight alignment is the same as that proposed for the curved alignment and consists in the proposed removal of the east and west cantilevers, as well as the deck and parapet walls in the central lane.

#### 11.2.1.2.2 Step 1 Deconstruction

In Step 1, the removal is similar to that proposed for the curved alignment, but the 'B' truss is also included in this phase of deconstruction, in addition to the 'A' truss, as well as the north and south trestle spans as illustrated in the Figure 11-3



**Figure 11-3: Step 1 deconstruction– straight alignment**

#### 11.2.1.2.3 Step 2 Deconstruction

Removal of the remaining main truss spans is proposed as the step 2 deconstruction. There are options related to the order in which the sequence of deconstruction is completed, each have different impacts



on timing, cost, and navigation. Table 11-2 provides a comparison of the advantages and disadvantages of two separate options for this Step.

**Table 11-2: Comparison of options for deconstruction – straight alignment**

Option	Deconstruction Sequence	Advantages	Disadvantages
<b>Option 1</b>	<ul style="list-style-type: none"> <li>• Suspended span</li> <li>• North and South cantilever spans</li> <li>• North and South anchor spans</li> </ul>	<ul style="list-style-type: none"> <li>• Lower deconstruction complexity than option 2.</li> <li>• Easier to maintain a navigation channel than option 2.</li> <li>• Slightly lower deconstruction cost than option 2.</li> </ul>	<ul style="list-style-type: none"> <li>• Longer deconstruction time than option 2.</li> </ul>
<b>Option 2</b>	<ul style="list-style-type: none"> <li>• South anchor span</li> <li>• Suspended span and South cantilever span</li> <li>• North cantilever span</li> <li>• North anchor span</li> </ul>	<ul style="list-style-type: none"> <li>• Shorter deconstruction time than option 1.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher deconstruction complexity than option 1.</li> <li>• Slightly higher deconstruction cost than option 1.</li> <li>• More complex to maintain a navigation channel than option 1.</li> </ul>

### 11.3 Construction Stage

The new bridge will be designed in accordance with the standards and best practices for highway bridge design in Canada in place at the time of the design and in particular, in accordance with MTO and MTQ regulations. A non-exhaustive list include:

- Canadian Standards Association (CSA). 2019. Canadian Highway Bridge Design Code, CSA S6-19
- MTQ. 2020. Manuel de Conception des Structures
- MTQ. 2019, (revised 2020). Manuel de Construction et Réparation des Structures
- MTQ. 2021. Ouvrages Routiers, Tome III – Ouvrages d’Art
- MTQ. 2020. Ouvrages Routiers, Tome VII – Matériaux
- MTQ. 2021. Ouvrages Routiers, Tome VIII – Dispositifs de Retenue
- Transportation Association of Canada (TAC). 2001. Guide to Bridge Hydraulics
- MTO. 2016. Structural Manual
- MTO. 2007. Structure Rehabilitation Manual
- CSA. 2018. G40.20-13/G40.21-13 (R2018) - General requirements for rolled or welded structural quality steel / Structural quality steel.
- Climate Change Provisions for CSA S6:25 Canadian Highway Bridge Design Code: Findings and Recommendations - CSA Group

The construction work may potentially be divided into four (4) Construction sub-stages. Construction activities will be further defined when technical components of the new bridge are developed and as the deconstruction process for the existing bridge is further developed.

However, some sub- stages might be overlapped or completed simultaneously with other construction activities to reduce the overall construction time. Potential general activities for each sub-stage are listed below.

### **11.3.1 Construction Sub-Stage 1 (Estimated 2028 -2029)**

The first sub-stage of construction activities may potentially include:

- Organization of the construction site
- Closure of Voyageur Pathway and detour towards Laurier Street
- Relocation of utilities
- Construction of a temporary dock for barges
- Installation of coffer dams in the river at location of new piers
- Installation of steel caissons through riverbed down to bedrock
- Removal of sediments within the caissons, down to bedrock
- Disposal of sediments off site
- Drilling into bedrock and removal of bedrock material
- Disposal of bedrock material
- Dewatering of caissons
- Installation of reinforced concrete within caissons
- Dewatering of coffer dam
- Construction of concrete footings
- Construction of new reinforced concrete piers
- Removal of cofferdams

### **11.3.2 Construction Sub-Stage 2 (Estimated 2030)**

The second sub-stage of construction activities may potentially include:

- Installation of bridge bearings on piers
- Assembly of superstructure over piers
- Construction of traffic deck and boardwalk deck

### 11.3.3 Construction Sub-Stage 3 (Estimated 2031/32)

The third sub-stage of construction activities may potentially include:

- Excavation for new abutments
- Disposal of excavated materials
- Construction of reinforced concrete abutments, installation of bearings
- Rearrangement of Boulevard des Allumettières and Laurier Street intersection (if required)
- Construction of Gatineau approach embankment retaining wall (if required)
- Construction of Ottawa approach to new abutment
- Assembly of superstructure from piers to abutments
- Construction of traffic deck and boardwalk deck from piers to abutments
- Waterproofing, paving, roadway/boardwalk markings on bridge and approaches
- Finishing of leisure areas
- Installation of lighting and Confederation Boulevard signage
- Connection of utilities
- Opening of Voyageur Pathway
- Opening of bridge to the public

### 11.3.4 Construction Sub-Stage 4 (Estimated 2032)

The fourth sub-stage of construction activities may potentially include:

- Removal of barges and the causeway
- Creation of fish habitat as compensation for in-water work/causeway
- Clean up of staging areas, removal of access roads, restoration of sites, removal of fencing, removal of temporary utilities, removal of vegetation protection, etc.
- Landscaping of disturbed areas as required by mitigation measures

## 11.4 Operations Stage

Maintenance and repair activities will be carried out throughout the life of the structure. The bridge design is not yet at a stage where maintenance and operating plans can be fully articulated; however, maintenance activities for a new bridge would typically include:

- Monthly and annual scheduled inspections as required
- Comprehensive detailed inspections scheduled every 3-5 years or as required
- Regular maintenance and minor repairs or interventions in case of an accident
- Cleaning above and below the deck, of the inside box girders (if required), of the waterway banks and around the foundation units
- Cleaning of drains
- Patching/re-paving, painting, snow removal, expansion joints replacement
- Cracks repair to the asphalt and crack sealing of concrete surfaces
- Major rehabilitations which typically include deck replacement, concrete repairs, waterproofing, structural steel repairs and painting, etc.

## 11.5 Preliminary Assessment of Project Footprint

The two alternative bridge alignments presented in Section 10.2.1, curved and straight designs, show that the conceptual bridge could potentially have the same number of piers as the current bridge, two on the Ontario side and four on the Quebec side. This will be confirmed as the design becomes further defined.

A preliminary assessment of the potential footprint of the Project within the riverbed and shoreline below the 2-year flood level was undertaken to provide information required for the Quebec impact assessment process (Section 18.2). The assessment considered the area that is anticipated to be needed for the removal of existing piers and construction of new piers, adding the area for cofferdams during deconstruction and construction activities. Figure 11-4 provides a diagram of the piers and anticipated workspace. In summary, within the Quebec river area, the Project covers an area of approximately 1,665m<sup>2</sup> as follows:

- the approximate area affected in the waterway to remove the existing piers is 765m<sup>2</sup>
- the approximate area affected in the waterway to construct the new piers is 900m<sup>2</sup>
- the approximate length of shoreline affected for the abutment of the bridge on the Quebec shoreline is 20m.

Installation of temporary construction wharfs required are shown in Figure 11-4.

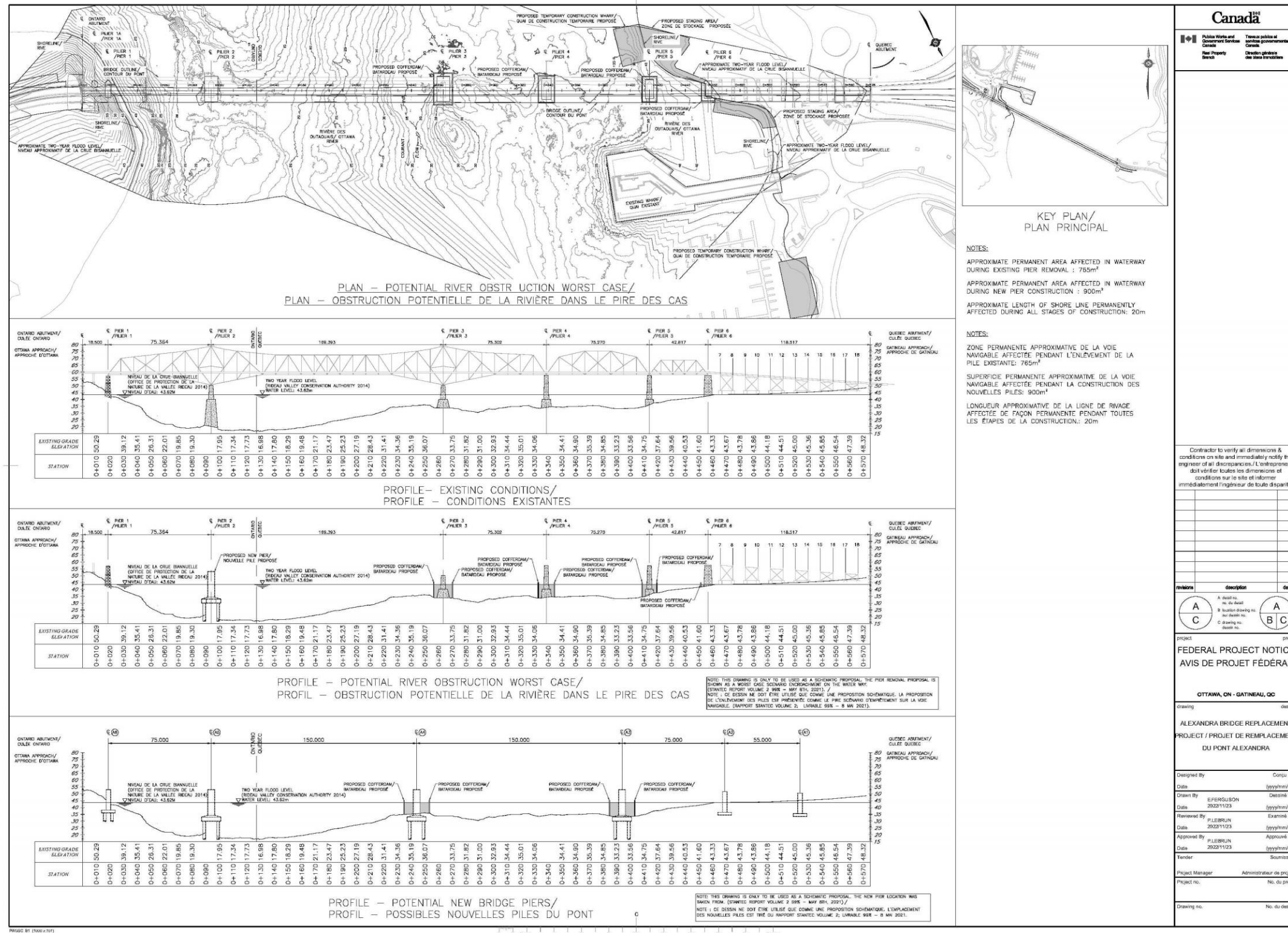


Figure 11-4: Potential footprint of the Project in the province of Quebec.

## 11.6 Associated Infrastructure and Activities

### 11.6.1 Minimum Practical Work Area

To ensure public safety and provide sufficient area to allow construction activities to take place, a minimum construction area surrounding the bridge is required.

The areas to be used for construction activities might impact NCC-owned land around the approaches to the existing bridge. Initial options have been identified in Jacques-Cartier Park, the grounds of the Canadian Museum of History and the Kruger Industrial plant located next to the museum. Areas on the Ottawa side of the river will also need to be identified for worker access. Technical considerations include the proximity of available options for staging areas near the bridge the general vicinity of staging areas to reduce transportation and barging of materials and conditions of use of certain areas to mitigate potential impacts (such as contamination). In addition, socio-economic factors that influence the final decisions such as impact to key partners and stakeholders operating in the area (e. g. wharf tenants, small businesses, museum, municipality) and environmental considerations such as proximity to the river, impact to other resources such as heritage or archeological features are all considerations in the final decisions.

Sites located immediately adjacent to the bridge include the existing parking area, marina building, and wharf, as well as an area actively used within Jacques-Cartier Park. These sites are highly valuable for the assembly of larger components for the bridge. While the wharf would be too close to the construction area for public use, this would give the contractor an excellent access for launching and parking service boats, as well as receiving deliveries of bridge components by barge. Its close proximity makes it an excellent candidate for temporary storage of key materials and could also be used for site trailers. The sites are likely to also be partially used as a small parking area for site visitors (e.g., NCC and PSPC staff) and would require coordination with adjacent museum deliveries. In addition, the sites could also accommodate trucks waiting to be unloaded so they don't have to park on the curbside lane of public roads, which would have traffic impacts.

Transportation related impacts would also be minimized as these sites are directly connected to work zone. Circulation between the construction area and staging area could be accommodated on-site and not use adjacent road network.

Use of Jacques-Cartier Park for staging is subject to NCC approval and requirements as a landowner. Depending on methods selected, deconstruction and construction activities may require use of docking or mooring structures within the park area to load and unload materials. There is also a concurrent need to maintain safe public access to the river to support commercial tourism operations and recreation activities. Options for infrastructure required to support ongoing operations while anticipating construction needs and the future use of the park are being evaluated. Impacted stakeholders will be engaged in the development of appropriate mitigation options.



## 11.6.2 Intersection Alignment

Construction of the new bridge provides an opportunity to make needed changes to the Gatineau approach and intersection of rue Laurier and Boulevard des Allumettières to address concerns related to vehicular accidents and safety for active mobility users. Changes to the intersection, which is owned by the City of Gatineau, may result in modifications to the bridge approach compared to its current location.

A study of traffic accidents at the intersection shows that 29 accidents have occurred in the last 3 years with no fatal accidents observed. However, 5 accidents resulted in minor injuries and 3 accidents involved cyclists, which represents 10% of the accidents. Moreover, the accidents involving cyclists all occurred when crossing the bridge approach.

Based on analysis using the Highway Safety Manual (AASHTO 2010), the capacity of the intersection, the deflection angle of the road coming from the bridge to the intersection with Boulevard des Allumettières and the presence of the right turn island from rue Laurier onto the road leading to the bridge combined with lane merging just before the bridge are considered important factors contributing to the high number of collisions. The reconfiguration of the bridge approach to eliminate the deflection angle between the bridge approach and Boulevard des Allumettières, will provide an adequate configuration according to road design standards and in accordance with user expectations. Concepts reflecting changes to the approach and surrounding lands are being analyzed as part of the design process, but a preferred design has not yet been confirmed. Coordination with the City of Gatineau has been established. A number of factors are proposed to assess potential alternatives including impact of intersection on the bridge alignment, safety for motorists and active mobility users, cost, traffic flow, views analysis on specific protected primary and secondary points, land use impacts, compatibility with future transit loop, alignment with approved plans, and implementation of design.

Major alignment change to the Ottawa approach is not being considered at this time to support the new bridge alignment. If changes to the road alignment are required to support other initiatives occurring in the area, they will be guided by decisions associated with those initiatives and impacts to existing parks and infrastructure will be addressed through the approval process for those Projects.





## 12 PROJECT CAPACITY

The existing Alexandra Bridge consists of the main cantilevered steel truss bridge with five spans, truss A, Truss B and the north trestle (refer to Figure 10-1). Its overall length is 563.27 metres (1,848 feet) and its width is 18.89 metres (62 feet). Its main cantilever span is 172.21 metres (556 feet). Due to the current condition of the bridge, its loading capacity was reduced to 27 T for the traffic lanes and 5 T for the active transportation lane. This capacity is expected to be maintained until the replacement date.

The dimensions of the replacement bridge being proposed are not yet available, however the general location of the approaches will remain the same and therefore the size of the bridge is expected to be of the same order of magnitude.

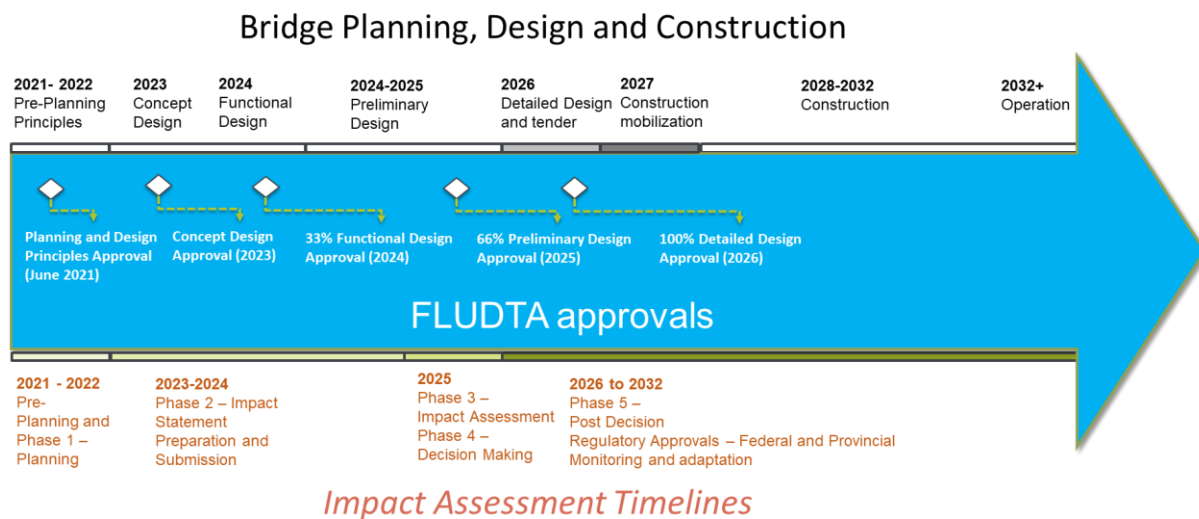
The loading capacity of new bridge will be in keeping with the Canadian Highway Bridge Design Code (CHBDC) and applicable design standards. The theoretical capacity of active transportation is expected to increase, as this lane will be wider and better separated than the existing boardwalk to meet current standards. The exact increase is still to be determined as part of the detailed design stage of the Project.



# 13 SUMMARY SCHEDULE

The proposed Project is currently in the planning and design stages, with construction estimated to begin in 2028. Construction is currently estimated to be completed in 2032. The new bridge is expected to be in use for at least 100 years, as such there is no defined timeline for its decommissioning and abandonment.

Figure 13-1 and Table 13-1 provide a summary of key planning milestones and the overall Project timeline based on information currently available.



**Figure 13-1: Alignment between construction stages, Impact Assessment Phases and FLUDTA Milestones**

**Table 13-1: Project milestones**

<b>Project Milestone / Task</b>	<b>Estimated Completion</b>
<b>PSPC/NCC submit the final Initial Project Description to IAAC</b>	Winter 2022
<b>Impact Assessment Phase 1 - IAAC posts Initial Project Description</b>	Winter 2022
<b>Impact Assessment Phase 1 – Submission of Detailed Project Description and Response to Summary of Issues</b>	Fall 2022
<b>Impact Assessment Phase 1 - IAAC Issues Tailored Impact Statement Guidelines</b>	Fall 2023
<b>Impact Assessment Phase 2 - Impact Statement submittal</b>	Fall 2024
<b>Impact Assessment Phase 2 - IS review including public comment period</b>	Fall 2024
<b>Impact Assessment Phase 3 – Submission of IA Report to Minister</b>	Fall 2025
<b>Impact Assessment Phase 4 – Minister Issues IA Decision</b>	Fall 2025
<b>Impact Assessment Phase 5 – Post Decision follow up to obtain required regulatory approvals</b>	Winter 2025
<b>Development and Approval of Final Bridge Design</b>	Summer 2028
<b>New Crossing Construction Activities Start</b>	Summer 2028
<b>Decommissioning of Alexandra Bridge</b>	Schedule to be confirmed
<b>Sub-Stage 1 Construction Activities</b>	Summer 2029
<b>Sub-Stage 2 Construction Activities</b>	Summer 2030
<b>Sub-Stage 3 Construction Activities</b>	Summer 2031
<b>Sub-Stage 4 Construction Activities: Project Completion</b>	Summer 2032

## Part D: Location Information and Context

### 14 PROJECT LOCATION

#### 14.1 Geographic Coordinates

The Alexandra Bridge is located at coordinates 45°25'49"N 75°42'16"W. The new bridge will make use of the existing approaches. The total length of the existing bridge is 563.27 m (1,848 ft).

##### 14.1.1 Site Map

Figure 14-1 provides a site map that shows the position of the bridge on the Ottawa River relative to the approaches in Gatineau and Ottawa. The yellow box represents the conceptual Project footprint that encompasses all potential alternative alignments. The red line is the current bridge right-of-way, the black shows the potential curved bridge design alignment, and the pink line shows the potential straight bridge design alignment.

Project Location on the Ottawa River

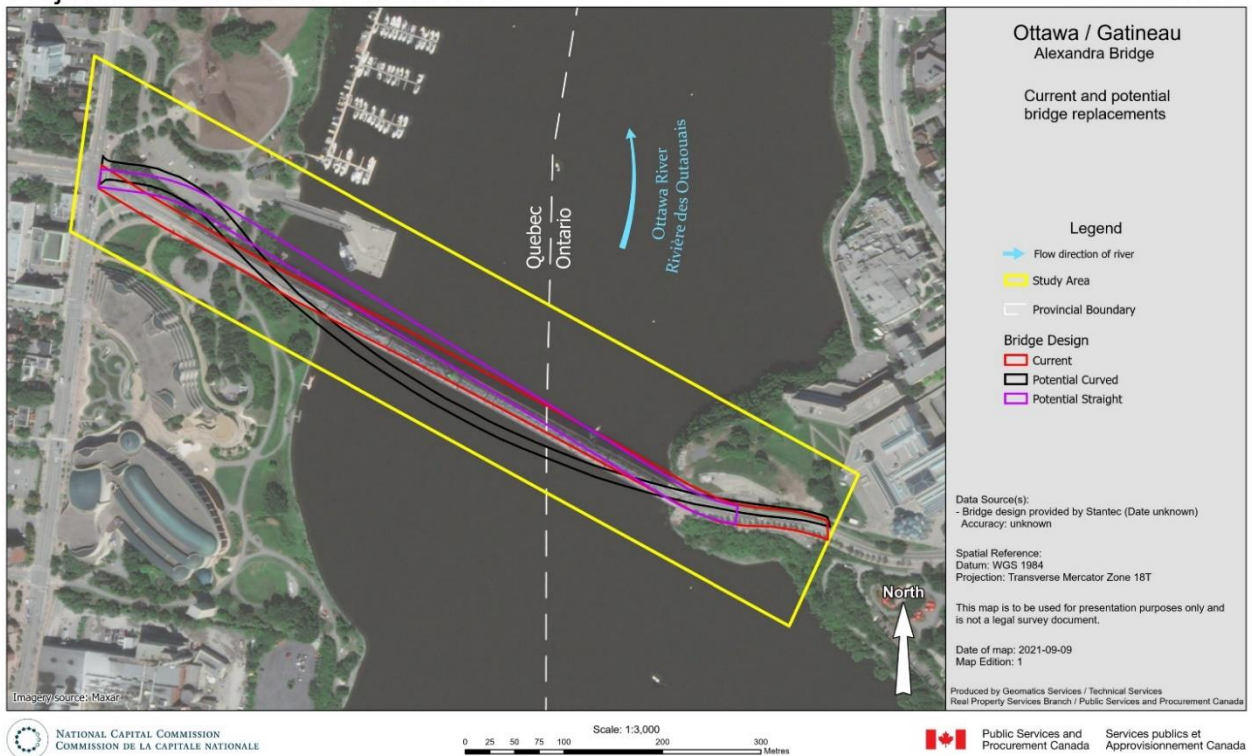


Figure 14-1: Project location on the Ottawa River

## 14.1.2 Legal Description of Land

To understand the ownership of land surrounding the bridge, refer to Figure 14-2. Most of the lands surrounding the bridge are federally owned, with the exception of the approach on the Gatineau side, owned by the MTQ. There are also areas of Jacques-Cartier Park adjacent to the bridge which are in the flood zone of the river and are owned by the Province of Québec.

The bed of the river is owned by both the Provinces of Québec and Ontario. For clarity, see Figure 14-3 which provides an inset of the land ownership on the Quebec side, where provincially owned lands are bounded by an orange line. There are no provincially owned lands along the shoreline on the Ontario side.

On the Québec side, the bridge and its approaches are located on or above lots 3 119 497, 3 119 498, 1 739 499, 1 739 500 and 6 267 073 of the cadasters of Québec. On the Ontario side, the bridge and its approaches are located on PINs 04280-0011 and 04280-0035.

PSPC intends to acquire the water lots from the provinces under the new crossing once its alignment is confirmed. Additionally, the easements noted on Figure 14-2 may be regularized as part of the Project planning.



Land Ownership

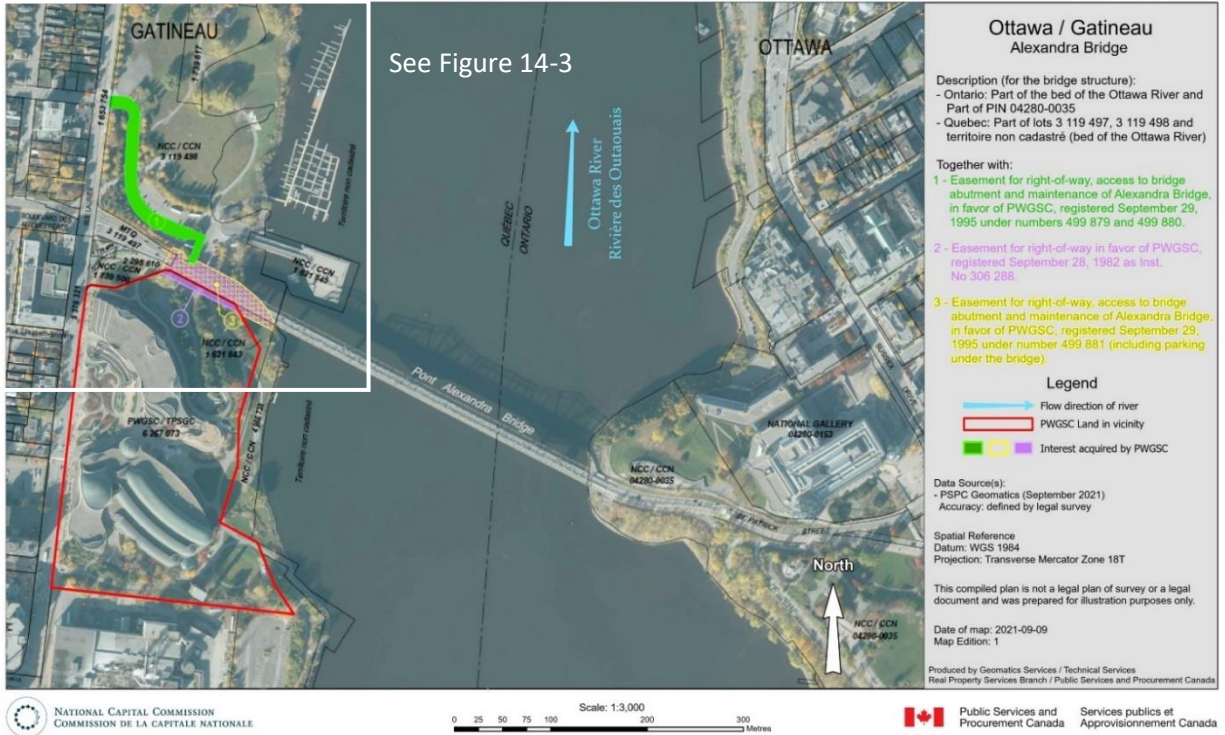


Figure 14-2: Land ownership

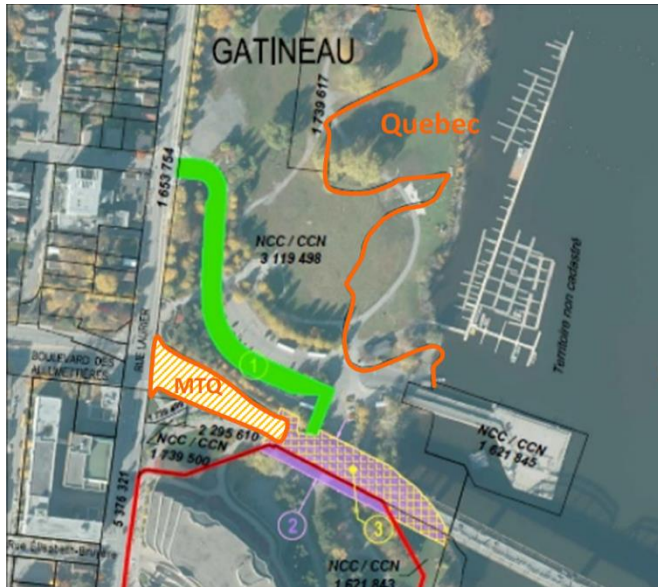


Figure 14-3: Inset showing lands owned by the Province of Quebec

## 14.2 Proximity to Federal Lands

The Project is located on federal lands and is close to several federal properties and buildings. Table 14-1 lists the name and location of federal lands, as well as the approximate distance to the Project at the Alexandra Bridge. The distances indicated in the table are relative to the nearest end of the Alexandra Bridge structure.

Areas to be affected by planned work will include NCC-owned land around the approaches to the existing bridge in both provinces. Some areas are yet to be confirmed, will be dependent on final design selection and there could also be sites identified on the Ottawa side. Proposed federal locations that may be affected for the purpose of carrying out the Project include lots 145244 and 25139 of the Directory of Federal Real Property. These lots are Jacques-Cartier Park and the Canadian Museum of History, respectively. For the legal description of land, refer to Section 14.1.2.

**Table 14-1: Federal properties near the Alexandra Bridge**

Property Name	DFRP	Province	Approximate Distance to Alexandra Bridge (m)
<b>Hull Wharf (in Jacques-Cartier Park)</b>	23767	QC	180
<b>Jacques-Cartier Park</b>	145244	QC	0
<b>Canadian Museum of History</b>	25139	QC	180
<b>Kiweki Point (formerly named Nepean Point)</b>	02751	ON	60
<b>Access Road, 1 Rideau St</b>	23797	ON	250
<b>National Gallery of Canada</b>	72001	ON	350
<b>Land (War Museum)</b>	09411	ON	270
<b>Global Centre for Pluralism</b>	144713	ON	310
<b>Major's Hill Park</b>	4127	ON	0

For additional reference, the location of the nearby federal properties are shown on the Figure 14-4 and Figure 14-5.

### Federal Properties near Alexandra Bridge - Ottawa

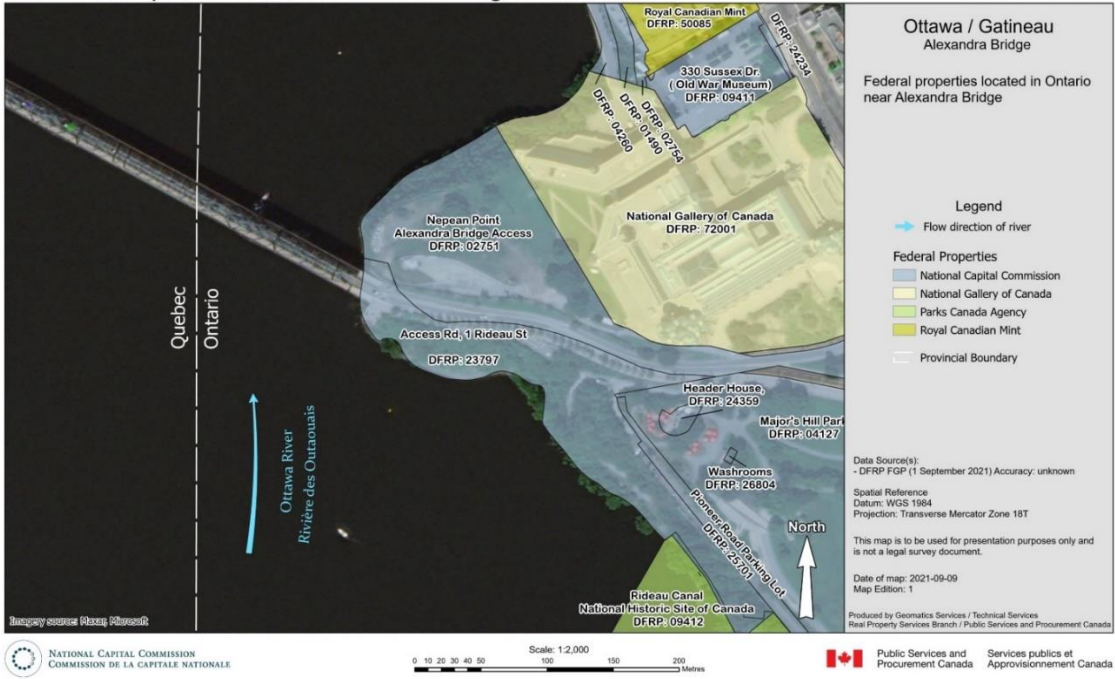


Figure 14-4: Federal properties near the Alexandra Bridge – Ottawa

### Federal Properties near Alexandra Bridge - Gatineau

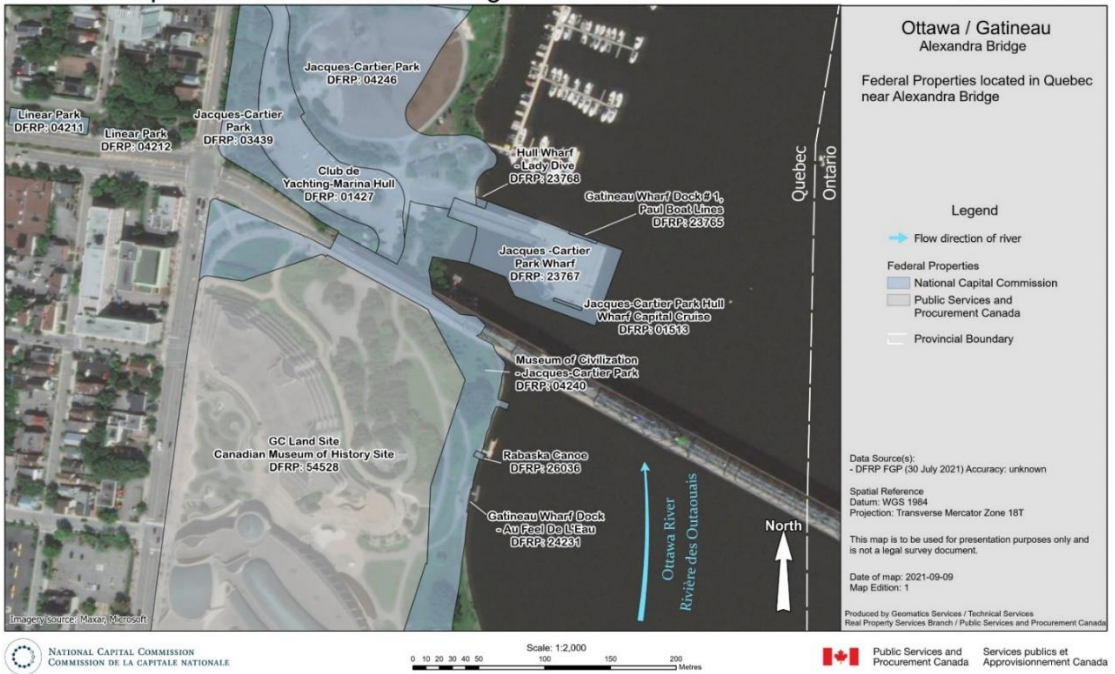


Figure 14-5: Federal properties near the Alexandra Bridge – Gatineau





## 14.3 Nearby Communities and Residences

The Project connects two cities and two provinces. As such, there are many surrounding communities that can access and benefit from their proximity to the structure. On the Ontario side of the bridge, neighbourhoods include Lowertown, Byward Market, Centretown, Parliament, and the Golden Triangle. On the Québec side, the nearest community is l'Île-de-Hull in the city of Gatineau. These communities will be engaged throughout the Project's lifecycle. The first stages of public consultation for the Project included two workshops with local stakeholder communities, an online consultation widely advertised in local media, and follow-up meetings with local community and business associations. Four additional stages of public consultation are planned, all of which will involve targeted engagement with nearby communities (see Section 4.6). The NCC and PSPC are also committed to engaging with nearby communities on an ongoing basis during and between formal stages of public consultation.

Both ends of the bridge are bordered by major public national landscape spaces and national cultural institutions that form part of Canada's Capital. In Québec, the bridge is adjacent to the Canadian Museum of History, as well as NCC's Jacques-Cartier Park. The Ontario side is lined with the Capital's first park, Major's Hill Park and the nationally significant landmark, Kìwekì Point (formerly named Nepean Point), as well as the National Gallery of Canada.

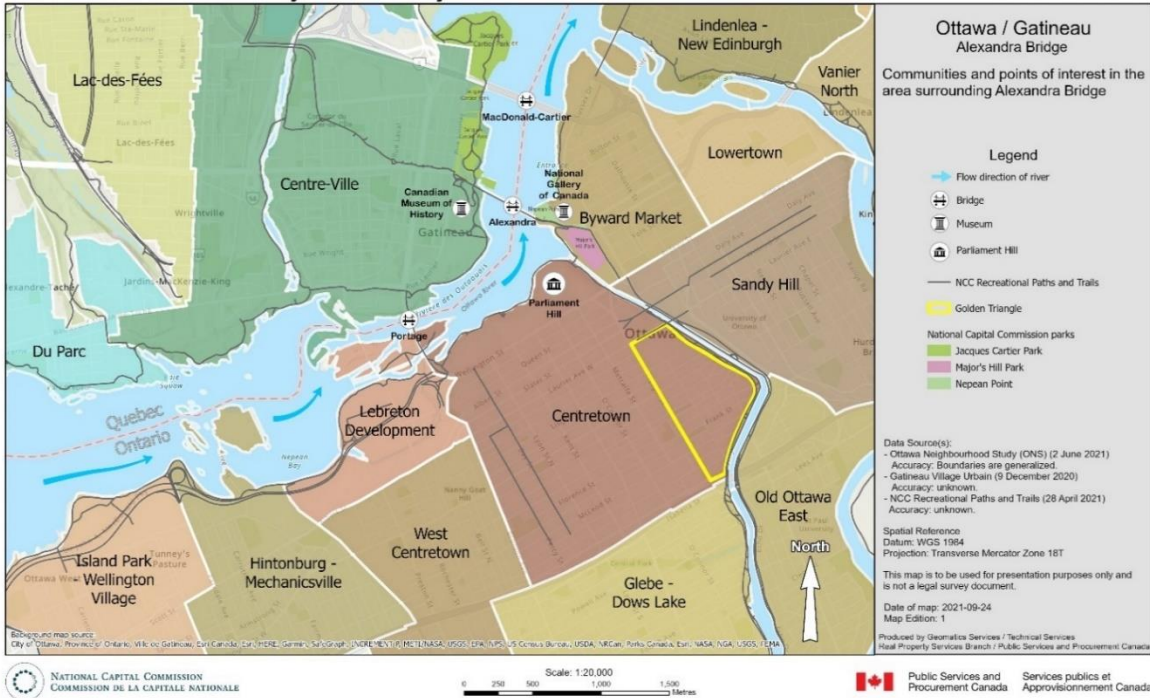
Table 14-2 provides a list of the nearest affected communities in terms of their land use profiles.

**Table 14-2: Affected communities in Project vicinity**

Community	Province	Residential	Commercial	Government Sector	Approximate distance to Alexandra Bridge (km)
<b>Byward Market / Lowertown</b>	ON	✓	✓		0
<b>Centretown</b>	ON	✓	✓	✓	1.2
<b>Golden Triangle</b>	ON	✓	✓	✓	1.7
<b>l'Île-de-Hull (part of Centre Ville)</b>	QC	✓	✓	✓	0
<b>Lowertown</b>	ON	✓	✓		1.4
<b>Parliament</b>	ON			✓	1.2

The communities listed in the table 14-2 are shown in the Figure 14-6 below, for reference.

# Communities in Vicinity to the Project



**Figure 14-6: Communities in vicinity to the Project**

Figure 14-7 provides a map of green spaces and areas of cultural significance to Indigenous communities in the vicinity of the Project that may need to be factored during planning for construction related activities (e.g. truck routes, detours).



## Green Spaces

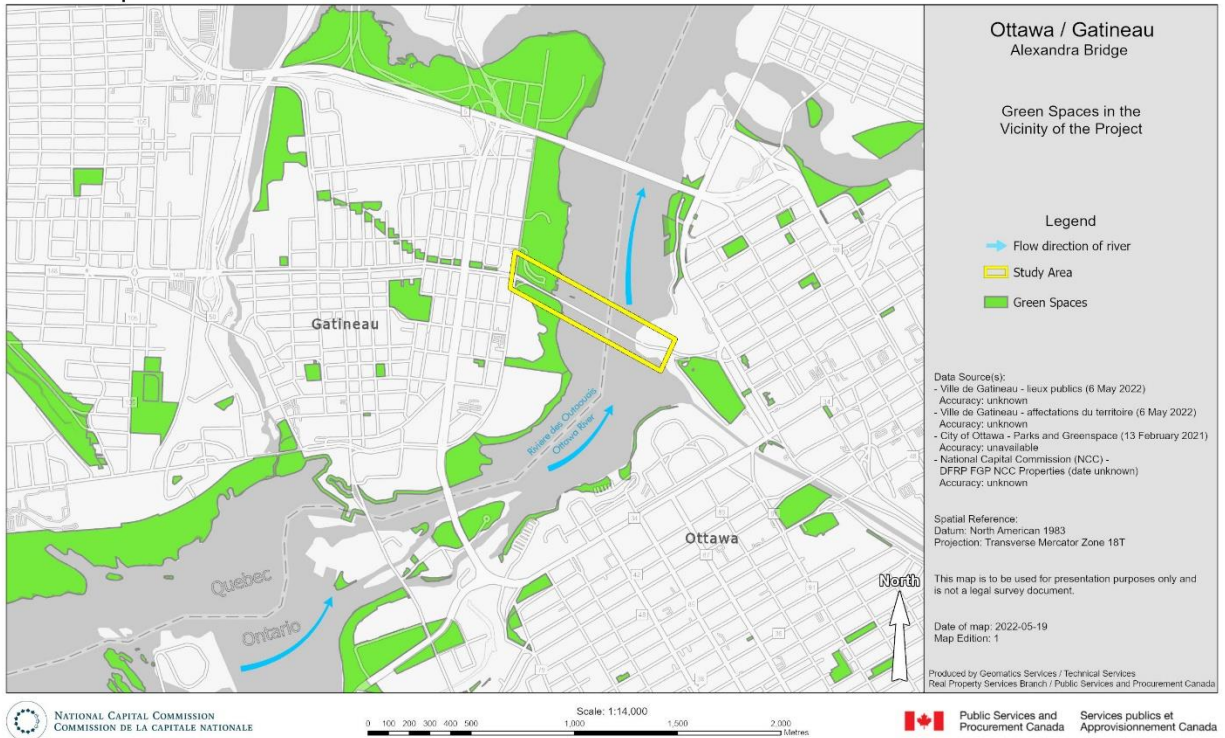


Figure 14-7: Green spaces in vicinity to the Project

## 14.4 Proximity to Indigenous Lands

The area in the vicinity of the Project has been a place of gathering, trade, harvesting and transportation for Indigenous Peoples for thousands of years (Walker, 2018).

All the Indigenous communities and organizations listed in Section 5.3 consider that the Alexandra Bridge is within their traditional territories or have expressed interest in engaging with the IPT.

The location of the Alexandra Bridge and the watershed of the Ottawa River and its tributaries have been identified by Indigenous communities as subject to land claims, assertions of title, modern treaty negotiations and court cases to establish the existence of Indigenous rights.

The Project is within the traditional territories of eighteen First Nations and organisations, listed below. The communities are described below and the location of the business centres are shown in Figure 14-8. Population figures for First Nations are from Indigenous Services Canada, First Nation profiles, as of November 2021. The Métis Nation of Ontario has also stated the interest of the members of its Region 6, which includes Eastern Ontario and the location of the Project.

### **Algonquin Anishinabeg Nation Tribal Council (AANTC)**

The AANTC provides consolidated advisory and technical services to seven Algonquin First Nations, of which six are in Quebec and one is in Ontario. The Council is governed by a Political Council of the Chiefs of each member Nation, and a Grand Chief and other executive members elected by the entire membership of the Algonquin Nations. The member Nations are:

- Le Conseil de la Première Nation Abitibiwinni
- Kebaowek First Nation
- Kitigan Zibi Anishinabeg Nation
- La Nation Anishinabe du Lac Simon
- Le Conseil des Anicinapek de Kitcisakik
- Long Point First Nation
- Wahgoshig First Nation
- Algonquin Nation Secretariat

The Algonquin Nation Secretariat represents three Algonquin First Nations: Timiskaming, Wolf Lake and Barriere Lake. The secretariat has provided advisory services to the member Nations in the past, but no indication has been given by the secretariat or the three member Nations about its current role.

### **Algonquins of Ontario**

Including the member Communities of:

- Antoine
- Bonnechere
- Greater Golden Lake
- Kijicho Manito Madaouskarini (Bancroft)
- Mattawa/North Bay
- Ottawa
- Shabot Obaadjiwan (Sharbot Lake)
- Snimikobi (Ardoch)
- Whitney and Area

### **Algonquins of Pikwakanagan First Nation**

Algonquins of Pikwakanagan First Nation was created as a First Nation under the Indian Act in 1873 and was known at the time as the Golden Lake Reserve. It has an on-reserve population of 453 members and another 2,833 members live off-reserve. The First Nation is 122 km from the Project.

### **Kebaowek First Nation**

Kebaowek is located 10 km west of Témiscamingue, on Lake Kipawa, 295 km from the Project. There are 295 members living on-reserve and 722 members off-reserve.

### **Kitigan Zibi Anishinabeg First Nation**

Kitigan Zibi was established in 1853 and is the largest Algonquin Nation in Canada in both area and population. There are 1,618 people in the community and another 1,745 members living in other areas. The First Nation is 106 km from the Project and is the closest First Nation to the location of the Alexandra Bridge.



**La Nation Anishnabe du Lac Simon**

Lac Simon is near the town of Val d'or in Northwest Québec, with 1,787 members living on-reserve and 479 members living off-reserve. It is 318 km from the Project, and French is the primary language.

**La Nation Huronne-Wendat**

The Huronne-Wendat First Nation has one community; Wendake adjacent to Quebec City and is located 370 km away from the Project. La Nation Huronne-Wendat comprises of slightly over 1,477 members living on reserve, and 2,757 members off-reserve.

**Le Conseil de la Première Nation Abitibiwinni**

Abitibiwinni is near the town of Amos in Northwest Québec, with 591 members living on-reserve in the community of Pikogan, and 492 members living off-reserve. It is 397 km from the Project, and French is the primary language.

**La Communauté Anicinape de Kitcisakik**

Kitcisakik is an Algonquin settlement on provincial Crown lands in la réserve faunique La Vérendrye, 269 km from the Project. There are 378 members living on-reserve and 138 off-reserve, and French is the primary language.

**Long Point First Nation**

Long Point, also known as Winneway, is located 116 km east of Ville-Marie in Western Québec and is 324 km from the Project. There are 505 members living on-reserve and 430 off-reserve.

**Métis Nation of Ontario – Region 6**

The Métis Nation of Ontario Region 6 council represents members of Métis Nation of Ontario living in Eastern Ontario.

**The Algonquins of Barrière Lake**

Barrière Lake is located 134 kilometres north of Maniwaki, on the shores of the Cabonga reservoir and is 217 km from the Project. There are 585 members living on-reserve and 210 living off-reserve.

**The Mohawk Council of Akwesasne**

The Mohawks of Akwesasne are located 111 km from the Project. The Mohawks of Akwesasne comprises 10,099 members living on-reserve and 2,985 members off-reserve.

**The Mohawk Council of Kahnawake**

The Mohawks of Kahnawake are located 157 km from the Project. The Mohawks of Kahnawake comprise of approximately 7,940 members living on-reserve and 3,270 members off reserve.

**The Mohawk Council of Kanesatake**

The Mohawks of Kanesatake are located 156 km from the Project. The Mohawks of Kanesatake comprise 1,374 members living on-reserve and 1,292 members off-reserve.

**Timiskaming First Nation**

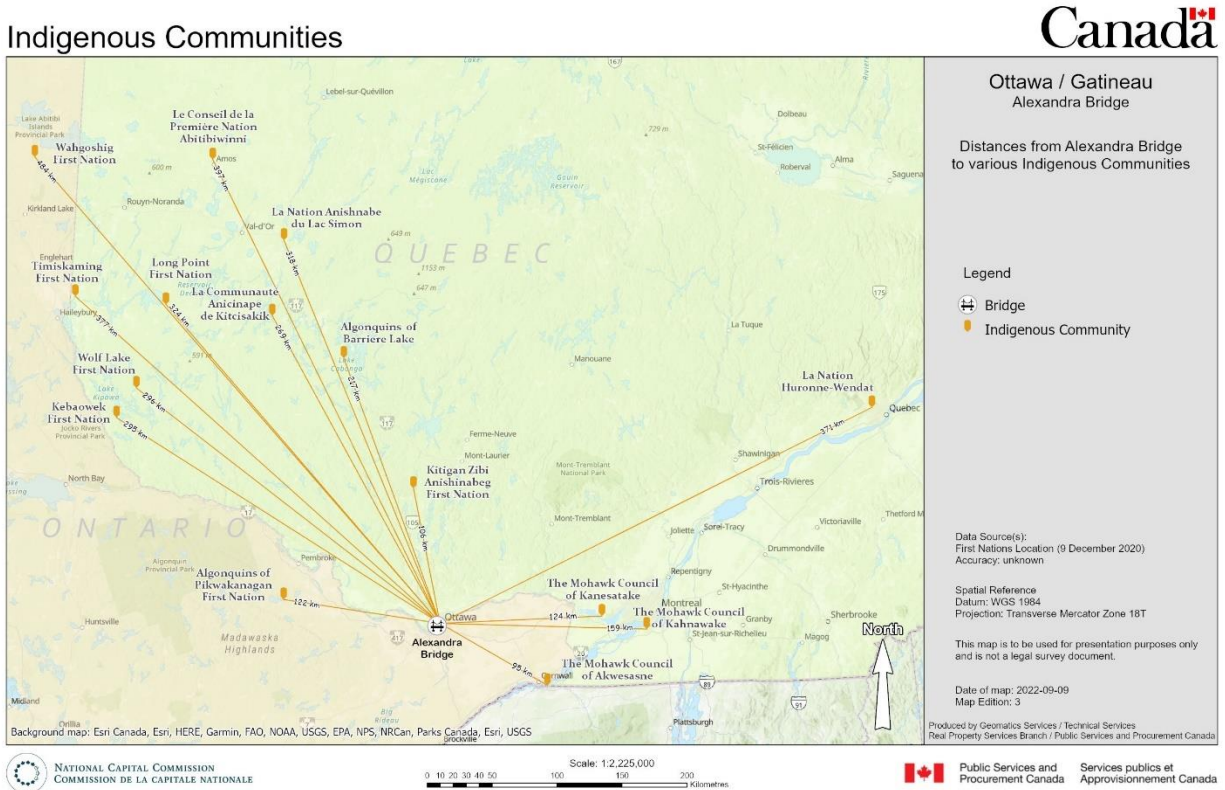
Timiskaming First Nation adjoins the municipality of Notre-Dame-du-Nord in Western Québec and is 377 km from the Project. There are 647 members living on-reserve and 1,701 off-reserve.

**Wahgoshig First Nation**

Wahgoshig was created in 1906 as the Abitibi-Ontario Band of Abitibi Indians #70, which was part of a reserve situated in both Ontario and Québec. Wahgoshig was created as a distinct First Nation in Ontario with its new name in 1986. It has a population of 144 members on-reserve and 242 members off-reserve. The First Nation is about 484 km from the Project.

**Wolf Lake First Nation**

The 244 members of the Wolf Lake First Nation live in the community of Hunter’s Point, near Témiscamingue, 296 km from the Project. The First Nation does not have a land base and the community leadership is seeking to secure title to reserve lands.



**Figure 14-8: Distance of Indigenous communities to the Project**

## 15 BIOPHYSICAL ENVIRONMENT AND POTENTIAL IMPACTS

To identify potential environmental considerations relevant to the Project, a desktop review of available information in the form of reports, maps and publicly available databases has been conducted (refer to Appendix F). Applicable information is provided throughout this section.

An update of the desktop review will be completed in winter 2022/spring 2023. The review will gather additional information published since the preliminary work for the development of the Initial Project Description was completed. This work will provide an opportunity to engage with Indigenous communities to gather knowledge from available reports, maps or any other source materials (that are acceptable to be shared) that may hold Indigenous Knowledge to contribute to the assessment of potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage. The additional information, including Indigenous Knowledge gathered in the desktop review, will contribute to a more detailed understanding of data gaps that require further investigation to evaluate potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.

Potential adverse environmental impacts of the Project, at this stage of the planning work, were evaluated through consideration of the interactions between the Project and the natural (physical and biological) environment. Mitigation measures that could avoid or reduce potential adverse environmental impacts are also identified. A preliminary characterization of potential residual Project-related impacts is provided. Residual impacts will be further evaluated and confirmed at the design stage, as will cumulative effects where appropriate and recommended follow-up program measures. Regulatory oversight (federal, provincial or municipal authorizations) is indicated throughout the text below.

The spatial boundaries for assessing Project impacts include:

- Project Development Area (PDA) - Encompasses the anticipated area of physical disturbance associated with the construction and operation of the Project. The Conceptual Project Footprint was used as the basis for the preliminary assessments conducted during at this stage. As the Project progresses, the PDA will be refined, as more detailed information becomes available.
- Local Assessment Area (LAA) - Encompasses the area in which Project-related impacts (direct or incidental) are predicted to occur. The LAA encompasses the PDA and a buffer around it (Valued Component specific).

For each valued component, specific spatial boundaries have been defined based on the anticipated area of impacts, as summarized in Table 15-1.

**Table 15-1: Summary of local assessment areas**

Valued Component	Local Assessment Area
<b>Atmospheric Environment</b>	500-m buffer around PDA
<b>Acoustic Environment</b>	500-m buffer around PDA
<b>Physiography, Geology and Hydrogeology</b>	200-m buffer around PDA
<b>Drainage and Surface Water</b>	200-m buffer around PDA
<b>Vegetation</b>	100-m buffer around PDA
<b>Wildlife and Wildlife Habitat</b>	100-m buffer around PDA
<b>Aquatic Environment</b>	200-m buffer around PDA

Valued components and their spatial boundaries will be reviewed and confirmed as the Project becomes better defined at the design stage. This will provide opportunities to identify valued components of concern to interested Indigenous communities and to establish appropriate boundaries for the assessment of impacts from the Project.

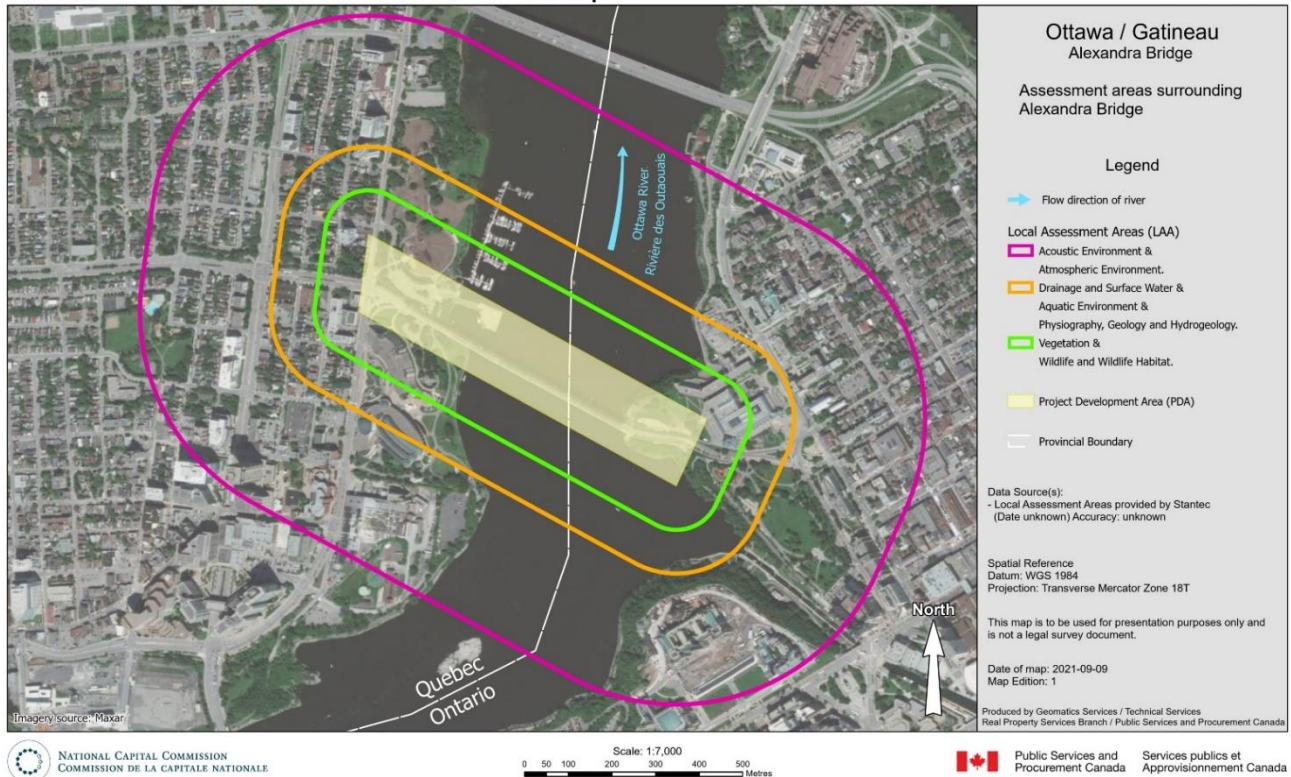
The spatial boundaries for the cumulative assessment on valued components of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in the existing characteristics of the valued component.

The proposed new bridge will meet the riverbank at roughly the same location as the existing bridge. For the purpose of this preliminary assessment, the PDA includes the footprint of the Project as required during decommissioning of the existing bridge and the construction and operation of the new bridge, including the area immediately surrounding the bridge and the approaches on both sides. In Figure 15-1, the circled areas represent the Local Assessment Areas for the following Valued Components:

- Green line - Vegetation, Wildlife and Wildlife Habitat
- Gold line - Drainage, Surface Water, Aquatic Environment, Physiography, Geology and Hydrogeology
- Pink line - Acoustic, and Atmospheric Environment



## Local Assessment Areas for Valued Components



**Figure 15-1: Local assessment areas for valued components**

The following sections describe the existing physical and biological conditions potentially impacted by the Project and identify mitigation and enhancement measures proposed to address potential impacts.

### 15.1 Physical Setting

The Ottawa River, a primary physical feature within the Project area, divides the communities of Gatineau and Ottawa and requires the need for a bridge crossing. The Ottawa River supports many different species of wildlife and provides drinking water to communities in its surrounding area. As such, many conservation efforts have taken place to protect the Ottawa River.

In 2016, a 590-km section of the Ottawa River along the Ontario-Québec border was designated part of the Canadian Heritage Rivers System (CHRS). The CHRS is a federal-provincial-territorial partnership that works to protect and monitor rivers of natural, cultural and recreational importance (The Canadian Encyclopedia, 2018). In addition, municipal initiatives to protect the Ottawa River have also been implemented by the City of Ottawa through its Ottawa River Action Plan, consisting of 17 individual Projects aimed at enhancing the health of the Ottawa River and protecting Ottawa’s water environment for future generations (City of Ottawa, 2020a).

## 15.1.1 Atmospheric Environment

For the purpose of this document, the atmospheric environment includes climate and air quality. See Section 20 for estimated GHG emissions associated with the Project.

The Ottawa-Gatineau area is in northern temperature zones characterized by short warm summers and long cold winters, with average temperatures ranging from -10.3 °C during the winter to 21 °C during the summer (ECCC, 2020a). In the winter, the area experiences average precipitation ranging from 54.3 to 76.4 mm and in the summer from 85.5 to 92.8 mm. The nearest Environment and Climate Change Canada weather station located at the Ottawa MacDonald-Cartier International Airport is approximately 12 km away from the Project. Climate data at this station is available from 1981 to 2010 (ECCC, 2020a).

Existing air quality conditions are determined by both regional and local sources. Regional air quality is affected mainly by a combination of industrial activities (e.g., Industrial Park in Ottawa 5 km away from PDA, paper factory in Gatineau 300 m from PDA) and transportation. Apart from emissions related to traffic and idling, local air quality influences are similar to regional influences.

### 15.1.1.1 Potential Impacts

#### 15.1.1.1.1 Deconstruction and Construction

Intermittent air emissions from equipment and vehicles will occur during the deconstruction of the existing bridge and during the construction stage of the new bridge, including the following sources: on-road mobile equipment (trucks), construction equipment (e.g., excavators, graders, concrete cutters). Deconstruction and construction activities associated with the Project will also have the potential to generate dust. The quantity of dust emissions depends on the area of land being worked, type of equipment on-site and level of construction activities. These emissions will be localized and of relatively short duration (i.e., 4 years of construction where not all equipment will be operating at the same time) and are unlikely to have any long-lasting impacts on the surrounding area. Potential impacts to human health at this stage of the Project will be confirmed in future steps of Project analysis.



Construction activities and an inventory of all potential air contaminants of concern will be further defined when technical components of the new bridge are developed. Based on similar projects, potential contaminants of concern that could be emitted during deconstruction and construction include those associated with the operation of construction equipment and dust generated by equipment moving across the site. Potential air pollutants that may be released as a result of the Project include:

- nitrogen dioxide (NO<sub>2</sub>)
- sulphur dioxide (SO<sub>2</sub>)
- carbon monoxide (CO)
- ozone (O<sub>3</sub>)
- fine particulate matter (PM<sub>2.5</sub>)
- coarse particulate matter (PM<sub>10</sub>)
- polycyclic organic compounds (PAHs)
- volatile organic compounds (VOCs)
- diesel particulate matter (DPM)
- dust (total suspended particles)
- metals and other substances

#### 15.1.1.1.2 Operation

During operation, traffic is predicted to be similar to existing conditions, which will result in similar or reduced emissions in the future in anticipation of regulatory reductions (greater emission controls on new vehicles) and advancements in engine technology (i.e., reduced emissions, zero-emission vehicles). At this stage of the Project, impacts to human health are anticipated to be positive, based on enhancements planned to support use of active transportation modes and advancements in vehicle technology that contribute to air quality.



Table 15-2 identifies, for each project stage, the physical activities that might interact with the atmospheric environment and result in the identified environmental impact.

**Table 15-2: Project interactions with atmospheric environment**

Project Stage	Physical Activities	Potential Impacts Change in ambient air quality
<b>Deconstruction</b>	Deconstruction of infrastructures	✓
<b>Construction</b>	Site mobilization and construction of temporary facilities	✓
	Land clearing and soil stripping	-
	Excavation, earthwork	✓
	Construction of infrastructure	✓
	Work in aquatic environments	-
	Deconstruction of temporary structures	✓
	Demobilization of construction site	-
<b>Operation</b>	Use of infrastructure	✓
	Maintenance and repair of infrastructure	✓
<b>NOTES:</b> ✓ = Potential interaction - = No interaction		

#### 15.1.1.2 Mitigation and Protective Measures

Applicable air quality standards that would be considered in the assessment include the National Ambient Air Quality Objectives (NAAQOs) and Canadian Ambient Air Quality Standards (CAAQS). Where applicable federal standards do not exist for some contaminants, provincial standards would be used, such as Ontario’s Ambient Air Quality Criteria (AAQC) set by the Ministry of the Environment, Conservation and Parks (MECP) or the Atmospheric Quality Standards (Sections 197 and 198 and Schedule K of the Clean Air Regulation) and criteria (*Environment Quality Act*) administered by the Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks (MEFCCWP) in Quebec.

Air pollution can have significant human health impacts. Poor air quality has been linked to respiratory and cardiovascular illnesses, hospitalizations and mortality. The reaction of an individual to air pollutants depends on the type of pollutant to which a person is exposed, the degree of exposure and the individual’s health status and genetics (Health Canada, 2017). An assessment on the implications to human health would be conducted (see Table 15-9) to evaluate potential impacts to human health from any air quality changes resulting from the Project.

An Air Quality Impact Assessment may be required to predict concentrations of pollutants emitted during all project stages (see Table 15-9 for planned future studies). The study methodology is not yet finalized, but the assessment of air quality effects related to the Project would include the following elements:

- Assessment of baseline ambient air quality conditions for the Project area from the existing published sources of air quality data
- Compilation of emissions inventories of all equipment and modelling to predict emissions from Project activities
- Dispersion modelling to predict any changes in the ambient concentrations of air contaminants of concern
- Comparison of dispersion model predictions to regulatory standards and ambient air quality criteria

Best Management Practices will be implemented, where applicable, such as reducing vehicle idling time, shutting down equipment when not in use, stabilizing disturbed areas through the use of water for dust control, and providing proper maintenance of equipment and vehicles operating in work areas.

Mitigation measures may include the following:

- Implementation of protection and mitigation measures for dust control, such as stabilizing disturbed areas through the use of water, chemical stabilization methods or use of vegetation or the use of physical barriers
- Implementation of a policy which will support green power use to control mobile equipment emissions
- Maintenance of emission systems, providing proper maintenance of equipment and vehicles operating in work areas
- Reduction of vehicular traffic on exposed soils and stabilizing high-traffic areas with suitable cover material
- Avoidance of excavation and other construction activities during windy and prolonged dry periods
- Stabilization of any stockpiled excavated soil in areas upwind of sensitive receptors
- Restoration of disturbed areas as soon as possible to reduce the duration of soil exposure

The methodology and approach for tracking and mitigating potential air pollutants will be determined based on the results of baseline studies as level of certainty about potential impacts increases, and a determination on residual impacts can be completed. Any follow-up and monitoring plans will be developed for Valued Components (VCs) where residual adverse effects are predicted or uncertain. The need for and extent for air quality studies will be confirmed and developed as the Project progresses. If required, a follow-up and monitoring plan would be implemented during relevant Project stages to verify the accuracy of predictions and determine the effectiveness of proposed air quality mitigation measures at representative sensitive receptors.

Additional information regarding air quality mitigation and protection measures during deconstruction and construction will be determined and confirmed as the Project is further defined.

Project contributions to ambient air emissions during construction are predicted to be limited, temporary, and localized. With the implementation of mitigation measures, residual impacts may occur, but are anticipated to be low in magnitude and short term in duration.

#### **15.1.1.3 Enhancement Measures**

The inclusion of a separate and protected laneway for mixed-use active transportation methods is proposed to increase the use of alternate modes of transportation, such as biking or walking. An increase in use of active transportation modes and a decrease in vehicular transportation could contribute to an overall decreased level of vehicular emissions in the local area. The design of the bridge is also expected to include the potential to adapt the structure for use by a tramway or light rail system as part of a future upgrade.

### **15.1.2 Acoustic Environment**

Noise sources in the Project area arise from a combination of urban city noises from surrounding neighborhoods. The Project area is primarily used for day-to-day transportation by personal vehicles and active transportation modes (i.e., biking and walking) year-round. Commercial trucks are not permitted to use the bridge. With the exception of the Kruger Product plant, the bridge is located in an area dominated by commercial and tourism uses, including docks located along the Ontario and Québec shores of the river. The docks are widely used for recreational boating, tourism and commercial purposes.

As noted in the Ottawa River North Shore Parklands Plan (NCC, 2018), the noise generated by vehicles travelling on the northbound steel deck of the bridge hinders the attractiveness of the Jacques-Cartier Park particularly in areas surrounding the wharf, marina and the lower section of the Jacques-Cartier Park South.

To date, field studies for the acoustic environment have not been completed, however an Acoustic Impact Assessment could be completed in 2025 if required (see Table 15-9 for details). A communication plan will be established to address noise-related complaints from future development activities.

#### **15.1.2.1 Potential Impacts**

##### **15.1.2.1.1 Deconstruction and Construction**

Construction noise is expected to be present from initial site preparation to completion of construction. Construction related sound levels might vary as construction activities change in location and intensity. Typically, construction noise impacts are temporary in nature and largely unavoidable. Construction noise impacts will be calculated for the Project later in the design stages once specific details of construction of the new and deconstruction of the existing bridge are determined. Noise associated with decommissioning of the existing bridge could include the use of pneumatic hammers and blunted chisel tools and will be confirmed later in the design stages. It is recommended that the detailed construction noise evaluation include deconstruction of the existing bridge and construction of the new bridge.

Project deconstruction and construction will require equipment whose operation may involve a temporary increase in noise levels. The most common noises associated with this stage will be from mobile equipment including trucks, cranes, excavators, bulldozers, compactors, tug boats, water pumps, generators, and drilling machines.

Residential areas in the District of Hull and the City of Ottawa that are located near the work area would potentially be affected by noise. The contractor will be required to ensure that the noise period and maximum possible noise level requirements for both cities of Gatineau and Ottawa are met.

In the City of Gatineau, By-law 44-2003 respecting noise in the territory sets out the following requirements with respect to construction sites and the use of motorized equipment:

- Work on a construction, renovation or demolition site located within 150 m of a building used as a dwelling may only be carried out from Monday to Saturday between 7 a.m. and 9 p.m., except in the case of emergency work on public infrastructures.
- It is also forbidden to use engines or machinery whose noise level perceived by an occupant of a building serving as accommodation is greater than 60 dBA during the day and 55 dBA at night.
- If the equipment (motors and compressors) are not used continuously, the levels are increased to 65 dBA during the day and 60 dBA at night.

In the City of Ottawa, the Noise By-law Number 2017 -255 gives the following requirements for construction sites:

- Construction work is prohibited from Monday to Saturday between 10:00 p.m. and 7:00 a.m., and on Sundays and holidays between 10:00 p.m. and 9:00 a.m.

Noise exposure associated with the Project has the potential to impact human health in terms of noise-induced sleep disturbance, noise complaints and annoyance. Sleep disturbance as a result of night-time noise includes difficulty falling asleep, awakenings, curtailed sleep duration, alterations of sleep stages or depth, and increased body movements during sleep, all of which can result in increased fatigue, irritability, and decreased concentration and performance (Health Canada (2017)). Health Canada (2017) notes that when project sound levels are greater than 75 dBA, complaints to authorities to stop noise can be expected. An indicator of potential noise-induced human health effects from exposure to long-term construction noise (i.e., > 1 year) is the calculated change in the percentage of highly annoyed (%HA) in an average community (Health Canada, 2017). Any changes in noise due to the Project and implications of such changes on human health would be determined in accordance with Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (2017).

The deconstruction and construction activities will respect Municipal Noise By-Laws, which restrict construction activities during the night. Sleep disturbance should not be a concern as a result of the Project. High Annoyance (HA) has been widely used as one way to estimate a community response to noise levels. Although individual reaction varies greatly, the reported change in %HA rates among an average community in reaction to certain sound levels provides usable exposure-response relationships. Health Canada (2017) uses the change in %HA as an appropriate indicator of noise-induced human health effects from exposure to long-term construction noise (greater than 1 year) exposure.

### 15.1.2.1.2 Operation

Once operational, bridge-related noise will be similar to existing conditions generated by vehicles travelling on the existing bridge. As the new bridge will have 2 lanes for vehicles (same as existing bridge), noise levels during operation are not anticipated to change from existing conditions. There could be a reduction in the overall noise generated because the steel deck of the bridge will be replaced with a new surface material.

Traffic volumes and use are anticipated to be similar to existing conditions, and as such, it is not anticipated that the Project will result in increased levels of noise compared to existing conditions.

Table 15-3 identifies, for each project stage, the physical activities that might interact with the acoustic environment and result in the identified environmental impact.

**Table 15-3: Project interactions with acoustic environment**

Project Stage	Physical Activities	Potential Impacts Change in ambient noise
<b>Deconstruction</b>	Deconstruction of infrastructures	✓
<b>Construction</b>	Site mobilization and construction of temporary facilities	✓
	Land clearing and soil stripping	-
	Excavation, earthwork	✓
	Construction of infrastructure	✓
	Work in aquatic environments	-
	Deconstruction of temporary structures	✓
	Demobilization of construction site	-
	<b>Operation</b>	Use of infrastructure
Maintenance and repair of infrastructure		-
<b>NOTES:</b>		
✓ = Potential interaction		
- = No interaction		

### 15.1.2.2 Mitigation and Protective Measures

Mitigation measures will be implemented (e.g., muffler systems, restrict construction activities to daytime hours (7 am to 9 pm)) to avoid / reduce the impacts of construction noise. Municipal noise by-laws will be followed as applicable during construction. Any noise impacts resulting from construction are considered reversible and are expected to cease once construction activities are completed. The frequency of individual noise-generating activities (e.g., grading) is expected to be sporadic in nature. Additional information regarding noise mitigation and protection measures during construction and deconstruction will be determined and confirmed as the design stages progress.



An Acoustic Impact Assessment is anticipated to be needed as part of the project planning (see Table 15-9) to identify existing receptors, establish baseline (ambient) noise conditions, and predict construction noise lasting longer than 1 year, including the magnitude of such changes and an evaluation of the change in percent highly annoyed (%HA) at each sensitive receptor. Where potential exceedances are predicted, appropriate noise mitigation measures will be employed.

During the deconstruction and construction stages, the Contractor will be required to comply with the bylaws and any other noise mitigation requirements. This may be addressed prior to the construction/deconstruction period through workshops or meetings with the community to address this issue and implement required mitigation measures.

Indicators of potential human health effects associated with noise include complaints and annoyance. A communication plan and complaints resolution process will be developed prior to construction to provide potentially affected individuals with information to address noise-related and other complaints during all construction activities.

Follow-up and monitoring plans will be developed for VCs where residual adverse effects are predicted or uncertain. If required, a follow-up and monitoring plan will be established to verify the accuracy of predictions and determine the effectiveness of proposed noise mitigation measures at representative sensitive receptors.

Project contributions to noise emissions during construction are predicted to be limited, temporary and localized. With the implementation of mitigation measures, residual impacts may occur, but are anticipated to be low in magnitude and short term in duration. Municipal noise by-laws will be followed as applicable during deconstruction and construction.

#### **15.1.2.3 Enhancement measures**

The inclusion of a separate and protected laneway for mixed-use active transportation methods is proposed to increase the use of alternate modes of transportation, such as biking or walking. An increase in active transportation trips and a decrease in vehicular transportation use could contribute to an overall decreased level of vehicular noise in the local area. The creation of a closed deck system should also contribute to an overall reduction of the vehicular noise experienced by visitors and users of Jacques-Cartier Park.

Temporary noise barriers will be considered during construction where the noise assessment indicates sensitive receptors may be affected.

### **15.1.3 Physiography, Geology, and Hydrogeology**

The following section provides a high-level description of the physiographical region, and an overview of the geology and hydrogeology of the Project area.

The Alexandra Bridge is located in the physiographic region classified as the Ottawa Valley Clay Plains. Near the Project and along the Ottawa River, limestone plains are the dominant physiographic landform (Chapman and Putnam, 2007). Surficial geology mapping suggests that the Project area is located within

an area of Paleozoic bedrock (OGS, 2010). Bedrock in the area is described as limestone and shale of the Verulam Formation (Armstrong and Dodge, 2007).

Topography slopes steeply on the banks of the Ottawa River, where the elevation ranges from 70m relative to datum (RTD) at the eastern extent of the Project to 40m RTD at the edge of the River.

As bedrock in the area is composed of limestone and shale, acid generation and/or metal leaching would only be a concern for the rock mass that will be disturbed and/or exposed during construction over the long term. The relatively small footprint of any rock disturbance anticipated from the Project suggests that any surface water or groundwater effects would be limited. Further geochemical analysis may be required to assess the potential for acid generation and metal leaching from the disturbed rock mass as the design of the new structure progresses. This characterization of the bedrock geochemistry would be used to develop appropriate strategies to manage excavation spoil and mitigation measures to address potential adverse changes to water quality.

The Project is in the Western Quebec Seismic Zone, which is a seismically active area in the Ottawa Valley in Eastern Ontario and Western Quebec. Historical seismic activity recorded by the Canadian National Seismograph Network shows the earthquakes concentrating in two sub-zones: along the Ottawa River and along a more active Montreal-Maniwaki axis. On average, an earthquake occurs in this Zone every five days (NRCan 2021), with earthquakes of > 4.5 on the Richter scale occurring several times per decade (Ma & Eaton, 2007). The largest historical event in this seismic zone is the 1935 Temiskaming earthquake at a magnitude of 6.2 on the Richter scale (Ma & Eaton, 2007). Therefore, there is potential for earthquakes to affect the Project.

WSP carried out a seismic study (WSP,2021c) on the Ottawa side of the Royal Alexandra Interprovincial Bridge on November 6, 2020. The purpose of this study was to investigate the subsurface, including depth to bedrock, provide a seismic site classification, as well as any additional information which is relevant to the geotechnical design of the bridge. The two (2) seismic methodologies used to characterize the subsurface were the seismic refraction method and the multi-channel analysis of surface wave method (MASW). These methodologies, survey design, procedure implemented to conduct the data analysis and the results are summarized in the report. The seismic study performed at the Royal Alexandra Interprovincial Bridge produced both a 2-D P-wave and a 2-D S-wave velocity profile.

A P-wave velocity profile calculated using the seismic refraction method has good vertical resolution and provides information regarding the lithological changes that occur within the first 14 meters of the subsurface. The P-wave velocity cross-section was broken up into four (4) layers. The layer nearest the surface is a low-velocity layer that consists primarily of topsoil, native material and/or backfill. This layer has a maximum P-wave velocity of 400 m/s and has a thickness of less than 1.0 m for the 45 m closest to the bridge. Past 45 m, the low velocity layer thickens to a maximum of approximately 2.0 m. The second layer has a maximum velocity of 2400 m/s and has been interpreted to be a weathered limestone that is approximately 3 m to 6 m thick. The competent limestone and/or dolostone bedrock has a velocity of greater than 2400 m/s.

The limestone with a velocity of greater than 3800 m/s shows limestone, which is more consolidated, has fewer fractures or a lower relative porosity. The S-wave velocity profile provides a larger vertical

resolution than the P-wave profile in the near-surface. The first two (2) to three (3) meters of S-wave data is less reliable due to the high frequencies required to properly characterize the very near-surface however, this method allows for characterization at depths of greater than 30 meters.

For the purposes of this project, the maximum depth of investigation was 30 meters in accordance with the regulations for seismic site classification in Canada. S-wave velocities were determined to be in the range of 760 m/s to greater than 2100 m/s across the area investigated. The resulting S-wave profile shows that most of the cross-section exhibits S-wave velocities greater than 1500 m/s, indicating that the site, below three (3) meters, is comprised of bedrock which is also confirmed through analysis of the P-wave profile. The area showing S-wave velocities below 1500 m/s corresponds with the thicker overburden seen in the P-wave profile. At a depth of 10 m, the easternmost and westernmost portions of the line exhibit S-wave velocities between 1500 m/s and 1900 m/s (green). This decrease in S-wave velocity is likely due to a change in lithology or an increase in porosity due to a higher fracture density in these locations. The P-wave and S-wave sections both show that in between 35 m and 50 m there is a higher velocity zone that reaches up to a depth of six (6) meters suggesting an increased level of competency of the bedrock here.

Based on the  $V_{s30}$  value of 1892 m/s (calculated as the average of the  $V_{s30}$  from each line) determined using the Multi-channel Analysis of Surface Waves (MASW) method outlined in this report, and table 4.8.1.4.A of the National Building Code of Canada, 2015 Edition, a site class of “A” could be considered for the Ottawa approach. The above seismic site classification is based solely on the average  $V_s$  value derived from this seismic study and can be superseded by other geotechnical information including, but not limited to, the presence of sensitive soils, liquefiable soils, peat, more than 3 m of soft clays, high water saturation, etc. The reader should refer to section 4.1.8.4 of the National Building Code of Canada, 2015 Edition for more information regarding the requirements for seismic site classification.

The site of the Alexandra Interprovincial Bridge in Ottawa side, Ontario, has a very thin overburden between one (1) and two (2) meters thick, which sits directly on limestone bedrock. The bedrock is of sufficient quality along the entire profile that a seismic site classification of “A” could be considered using solely the S-wave velocity information from this seismic investigation. It should also be noted that there is an area where the bedrock is of relatively higher quality, in terms of P-wave and S-wave velocity, between 35 meters and 50 meters along the profile.

For the Ontario Approach, it has been assumed that the abutment footings for the new bridge will be placed directly on the bedrock surface. For a foundation placed on bedrock, a site class of “A” can be considered, based on the  $V_{s30}$  value of 1892 m/s.

For the Ottawa River, based on the rock core retrieved during the geotechnical investigation (WSP,2021c), the proximity of the MASW conducted on the Ottawa side of the river and the fact that the same rock formation extends from Ottawa side to the riverbed (as per the geological maps), a site classification of “A” can be considered, based on “Site Classification for seismic site response” in the CHBDC 2014 (see table 4.1 of CHBDC). A further geophysical investigation in the river would be required to confirm this determination.

For the Quebec approach, no characterization of the  $V_{s30}$  values has been carried out, and the seismic classification has been carried out based on the requirements of the CHBDC. This table allows for

seismic classification based on the average standard penetration resistance values. For a foundation placed on compact to dense glacial till a site class of “D” can be considered.

In case the proposed foundation is a piling system-end bearing type sitting on bedrock, a site class of “D” can be considered. If the piling system is properly anchored in the bedrock and assuming the same rock formation continues from Ottawa across the river to Gatineau (as indicated on the geological maps), a site class of “A” can be considered provided that MASW be carried out to confirm the shear wave velocity.

The response to a query submitted through the MEFCCWP *Hydrogeological Information System* indicated that there is one well located within 500 m of the western (Quebec) side of the Alexandra Bridge (MELCC, 2020). The well is drilled to a depth of 61 m below ground surface (mbgs). The well report suggests that the bedrock is approximately 3 m bgs and the overburden is gravelly clay. A review of water well reports (WBRs) in Ontario suggests that there are 16 wells within 500 m of the project, the closest of which indicates that the bedrock is within 1.8 m of the ground surface and is composed of limestone and shale. Available water level data from water well reports suggest that the groundwater is approximately 3 mbgs.

The phase II Environmental Site Assessment (ESA) (WSP 2021a) completed for this project suggests bedrock around 6.1 metres below ground surface (mbgs) on the Quebec side of the river. Surficial deposits are composed of fill material (generally consisting of silty sand with gravel and trace amounts of debris) and glacial till (silty sand with some gravel and trace clay). Analytical results of the soil show exceedances of CCME guidelines for metals/inorganics, PAHs, Petroleum Hydrocarbons (PHC) and VOCs. Groundwater was observed in an unconfined aquifer in the native glacial till deposit or in the fill material. Groundwater analytical results show exceedances of metals/inorganics (WSP 2021a).

On the Ottawa side of the river, the phase II ESA (WSP, 2021a) indicates bedrock between 1.0 and 3.4 mbgs. Surficial deposits are composed of fill material, generally consisting of silty sand with gravel and trace amounts of debris. Analytical results of the soil show exceedances of CCME guidelines for inorganics and PAHs. Groundwater was observed in an unconfined aquifer in the limestone bedrock. Groundwater analytical results show exceedance of metal/inorganics and VOCs (WSP 2021a). In several locations a significant stratum of wood chips was encountered ranging in thickness from 5 to 13.1 meters. Wood chip material was underlain by sand, gravel and silt sediment. Below this layer limestone bedrock was encountered. Analytical results of sediment show exceedances of PAHs, and wood chips show exceedances of metals and PAHs (WSP 2021a).

The east side of the Project is located within the Rideau Valley Source Protection Area. The nearest Ontario-regulated municipal drinking water supply is approximately 1.8 km upstream of the Project and is located at the Lemieux Island surface water intake (Mississippi-Rideau Source Protection Committee, 2020). The nearest downstream surface water intake is approximately 30 km from the Project and is associated with the Rockland water supply system (MECP, 2020a). There are no municipal groundwater sources near the Project. The nearest Québec-regulated municipal drinking water supply system is the Hull Water Treatment Plant located approximately 800 m upstream of the Project.

The Project is located within a Highly Vulnerable Aquifer, as is much of the City of Ottawa. The area has a vulnerability score of 6, under the *Clean Water Act* (2006) list of prescribed drinking water threats.

Mitigation measures will be required should listed activities that could result in a considerable chemical and/or pathogen threat to the surface water supply (MECP, 2018) occur in the Project area. Based on current understanding of the proposed construction, activities are not anticipated to include any of these prescribed threats and the Project is not considered a threat to drinking water supply systems.

### **15.1.3.1 Potential Impacts**

#### **15.1.3.1.1 Deconstruction and Construction**

Specific construction details for the Project are not yet available. However, it is anticipated based on the above review that anchors will be installed in bedrock and that bedrock is shallow or exposed at the Project area. Excavations are not expected to affect the surface water intake at Lemieux Island or in Hull, both of which are located over 800 m upstream of the Project area.

During dewatering, discharge water may be released to the environment. An uncontrolled discharge of water during dewatering could cause localized downstream flooding, erosion or sedimentation.

If shallow overburden is encountered, disturbance to overburden during bridge construction may cause soil erosion and slumping during construction that may require rehabilitation, specifically in the steep area adjacent to the river.

#### **15.1.3.1.2 Operation**

No impacts to physiography, geology or hydrogeology are anticipated as a result of Project operations.

Table 15-4 identifies, for each project stage, the physical activities that might interact with Physiography, Geology and Hydrogeology and result in the identified environmental impact.

**Table 15-4: Project interactions with physiography, geology and hydrogeology**

Project Stage	Physical Activities	Potential Impacts	
		Change in groundwater quality and quantity	Change in soil quality and quantity
<b>Deconstruction</b>	Deconstruction of infrastructures	✓	✓
<b>Construction</b>	Site mobilization and construction of temporary facilities	✓	✓
	Land clearing and soil stripping	-	✓
	Excavation, earthwork	✓	✓
	Construction of infrastructure	✓	-
	Work in aquatic environments	✓	✓
	Deconstruction of temporary structures	-	-
	Demobilization of construction site	✓	✓
<b>Operation</b>	Use of infrastructure	-	-
	Maintenance and repair of infrastructure	-	-
<b>NOTES:</b> ✓ = Potential interaction - = No interaction			

**15.1.3.2 Mitigation and Protective Measures**

A geochemical analysis may be required to determine the acid rock drainage (ARD) potential and potential mitigation measures. The analysis will commence with static laboratory testing of rock samples including acid-base-accounting to assess the acid generation potential. Shake flask extraction and total metals testing will be conducted to assess the metal leaching potential. The analysis may be progressed to kinetic testing based on the results of the static tests. The MEND Prediction Manual (Price, 2009) will be used as a guide to evaluate the ARD risks.

Follow-up and monitoring plans will be developed for VCs where residual adverse effects are predicted or uncertain. If required, a follow-up and monitoring plan related to potential acid rock drainage would include water quality testing during construction and static testing of samples of excavated bedrock. Background samples will be taken upstream and downstream prior to commencement of works to assess the ongoing impact of construction.

To mitigate the potential effect of seismic activity, the new bridge will be designed and constructed in accordance with the seismic requirements of the National Building Code of Canada 2015 and the Canadian Highway Bridge Design Code (CSA, 2019), or those in effect during bridge design stages.

For groundwater dewatering, the Ministry of the Environment, Conservation and Parks (MECP) allows registration under the *Environmental Activity and Sector Registry* (EASR) for construction dewatering projects where groundwater takings will be greater than 50,000 L/day and less than 400,000 L/day, however, should groundwater takings exceed 400,000 L/day, a Permit to Take Water (PTTW) may be required from the MECP. Dewatering may be necessary to construct the bridge piers and abutments, the extent of which would be determined through further study. Appropriate mitigation measures would be installed during isolation and dewatering activities to manage the discharge of water, including appropriate erosion and sediment controls and ensuring that discharge water is properly filtered (i.e., filter bags, discharge across grassed areas, check dams) prior to discharge to the Ottawa River. Groundwater dewatering is not anticipated to affect any groundwater drinking water supply sources in the LAA.

The bed of the Ottawa River represents a groundwater discharge zone, which could be encountered while installing and dewatering the caissons for bridge piers. This potential would be investigated through geotechnical investigations and hydrogeological conditions within the Project footprint would be confirmed through field studies, which may include measures such as geophysical profiling of the riverbed, drilling of pilot boreholes ahead of caisson installation, and grouting of bedrock to investigate if high conductivity features are present (faults or karst structures) to avoid uncontrolled groundwater inflow to the caissons. The results of the investigation will guide mitigation measures should they be required.

Existing conditions and predicted effects on water quality will be compared against the CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CWQG-FAL) (CCME, 2012).

Based on this preliminary assessment, residual impacts on physiography, geology and hydrogeology as a result of construction activities, following the implementation of mitigation measures, are likely to occur, but are predicted to be low in magnitude, localized to the areas of potential dewatering activities, (i.e., within 200 m buffer around PDA), and be short-term and reversible following dewatering activities.

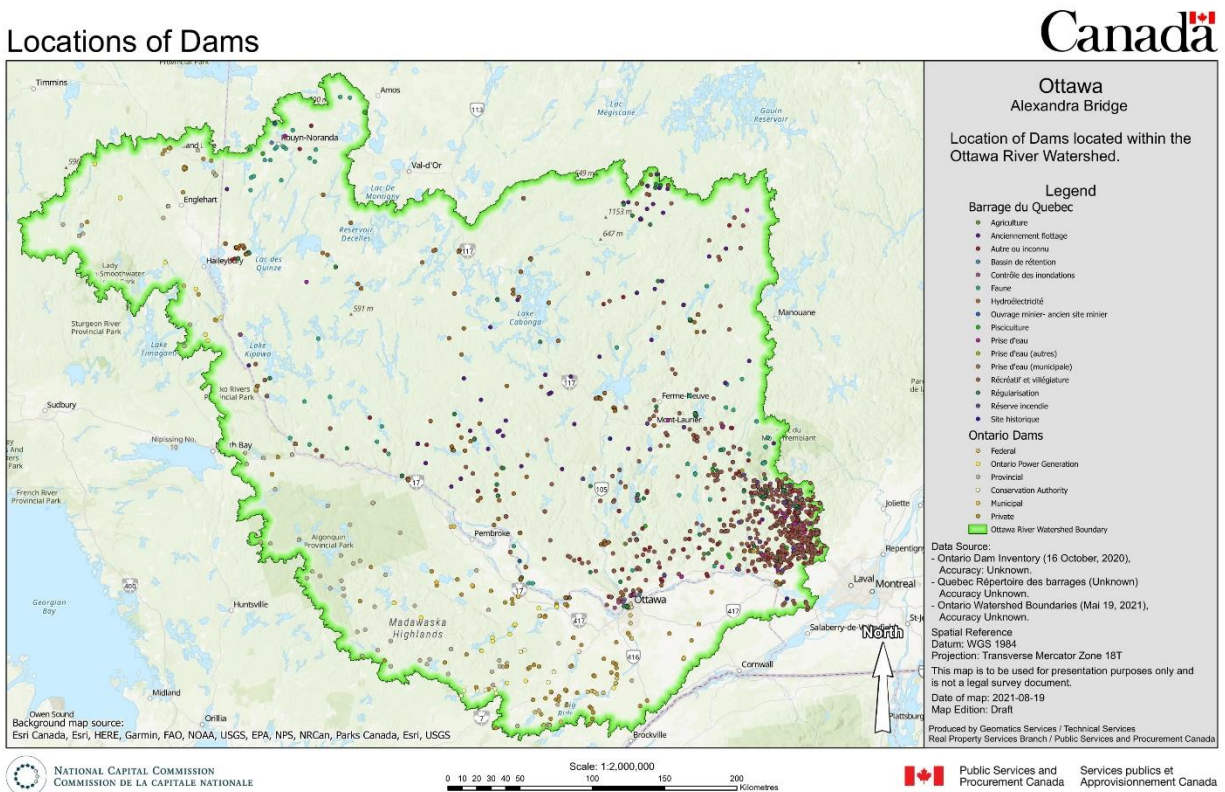
#### 15.1.4 Drainage and Surface Water

The existing Alexandra Bridge is supported by six solid piers (concrete and masonry) erected on the bed of the river (wetted perimeter). Much of the existing bridge deck is an open-grate deck and precipitation passes through the bridge deck unmanaged and untreated. The banks of the Ottawa River are generally steep in nature due to the natural bedrock formations and outcrops. Some of the banks are lined with armour stone and large boulders providing protection against erosive forces and ice formations.

In the vicinity of the Project, notable local in-water structures include the Jacques-Cartier Park (Hull) Wharf and pedestrian look-out immediately north (downstream) of the Alexandra Bridge, as well as the Portage Champlain Yacht Club with dozens of boat slips and timber jetties located downstream of the Marina. Multiple commercial and tourism docks are also located along the Ontario and Québec shores of the river. As such, the river is widely used for recreational boating and tourism.

From the headwaters, the Ottawa River flows generally from the northwest to the southeast draining into Lake of Two Mountains west of Montreal before converging with the St. Lawrence River ultimately into the Gulf of St. Lawrence. Due to the meandering nature of the river, the flow orientation at the Alexandra Bridge is from south to north, with Québec on the left (west) bank and Ontario on the right (east) bank. Upstream of the Alexandra Bridge there are two main watersheds that make up the Ottawa River, the Upper Ottawa Watershed and the Central Ottawa Watershed, with a total catchment area of approximately 91,400 km<sup>2</sup>.

The Ottawa River is highly regulated with many dams scattered throughout the watershed that provide flood control, power generation and recreation opportunities (refer to Figure 15-2). The nearest dam to the Alexandra Bridge is the Chaudière Dam, a hydroelectric power plant located approximately 2 km upstream of the Alexandra Bridge. The crescent shaped dam is located where the Ottawa River naturally narrows between the rocky escarpment creating a series of cascades. The dam is owned and operated by Portage Power, a subsidiary of Hydro Ottawa.



**Figure 15-2: Location of dams**

The Ottawa River is a main waterway artery within eastern Ontario and Western Québec and contains multiple Water Survey of Canada (WSC) gauges as well as dams and associated hydroelectric power generation stations. WSC has continued to operate a water level gauge at the Jacques-Cartier Marina in Hull, Québec immediately downstream of the Alexandra Bridge since 1964 (Station ID: O2LA015). Daily historical water levels observed at the gauge range from 40.909 m above mean sea level (amsl) to 45.168 m amsl with a mean of 41.80178 m amsl based on the records from the WSC Station for the



period from August 1964 to October 2019 (WSC, 2020). The range between the lowest and highest water levels in the river for the last 55 years is 4.26 m. The maximum water levels recorded correlates with the extreme flooding the Ottawa and Gatineau Regions experienced in April and May 2019. Water levels at this monitoring location are not thought to be significantly influenced by downstream dams. Flow rates within the river are not monitored at this gauge, but rather can be calculated as a function of the water level.

Approximately 13 km upstream of the Alexandra Bridge, WSC Station ID 02KF005 (Ottawa River at Britannia) has monitored flow rates from 1960 to the present day. Flow rates at the gauge are calculated as a function of the water level. Daily historical flow rates calculated at this gauge range from 165 m<sup>3</sup>/s to 5,980 m<sup>3</sup>/s with a mean annual flow rate of 1,224 m<sup>3</sup>/s based on the records from the WSC Station for the period from July 1960 to December 2019 (WSC, 2020). Annual flow within the Ottawa River is typically observed to be lowest from July to October and highest from April to May (WSC, 2020).

The highest recorded flow rate of 5,980 m<sup>3</sup>/s was in May 2019 during an extreme flooding event. Although in relatively close proximity to the Alexandra Bridge, these flow rates should not be directly compared to those exhibited at the Alexandra Bridge because of the Chaudière Dam which is located 11 km downstream of this WSC gauge and 2 km upstream of the existing Alexandra Bridge. Water levels for the Alexandra Bridge are represented by WSC gauge 02LA015 immediately downstream of the bridge.

The City of Ottawa has three water quality stations (ORS-410.10, ORS-410.40, and ORS-410.70) along the Ottawa River at the MacDonald-Cartier Bridge which is located about 750 m downstream of the Alexandra Bridge. Based on 2008-2017 data, field pH ranged from 6.78 to 8.48 with an average of 7.54 and field dissolved oxygen ranged from 7.53 to 12.39 mg/L with an average 9.65 mg/L. Total Kjeldahl Nitrogen (TKN) ranged from 0.23 to 0.52 mg/L with an average of 0.32 mg/L. Water temperature varies in a broad range based on the season, summer maximum is 26 degrees C and an average water temperature for spring, summer and autumn is 19.1 degrees C. No data for total dissolved solids exists in this data set. Data for selected metals (aluminum, antimony, arsenic, cadmium, chromium, cobalt, copper, iron, lead, molybdenum, nickel, silver, tin, and zinc) are also available for City of Ottawa monitoring stations at MacDonald-Cartier Bridge. The Canadian Water Quality Index (CWQI) at these stations is “good” and ranged from 89.02 to 90.98.

Due to the proximity to dense urbanization, the Ottawa River is susceptible to water quality impacts caused by common sources of anthropogenic pollution. Water quality records for the Ottawa River and local tributaries are available from the City of Ottawa’s Stormwater Management Services department. Water quality data for the Ottawa River collected at three different sites on the upstream side of the Macdonald-Cartier Bridge (740 m downstream (north) of the Alexandra Bridge) is available for the period of 2008-2017. This data indicates that the total suspended solids (TSS) concentration at the sampling sites ranges from 1 mg/L to 7 mg/L with an average of 2.71 mg/L and the total phosphorus concentrations range from 0.005 mg/L to 0.036 mg/L with an average of 0.013 mg/L (City of Ottawa, 2020b). There are no Ontario MECP Provincial (Stream) Water Quality Monitoring Network (PWQMN) stations on the Ottawa River within proximity to the Alexandra Bridge.

### 15.1.4.1 Potential Impacts

#### 15.1.4.1.1 Deconstruction and Construction

Construction activities have the potential to impact water quality within the Ottawa River. Water quality during construction is regulated through Section 34 of the *Fisheries Act* with respect to deleterious substances which have the potential to degrade or alter the quality of the water. The construction stage of the Project has the potential to result in bed and bank disturbance/erosion, which may result in potential turbidity spikes, TSS loading and overall sedimentation.

The main potential contaminant of concern for construction dewatering activities is turbidity arising from elevated total suspended solids (TSS). The geotextile filter bags (or equivalent) will be used as mitigation measures. Additionally, visual and olfactory inspections of the discharge location shall be completed. The water being discharged would not contain hydrocarbons or other substances in amounts sufficient to create a visible film, sheen, foam, or discolouration in the discharge water.

The fluvial geomorphology, flow conveyance and water velocity of the river have the potential to be impacted by the removal of the existing bridge piers and design/installation of the new piers.

As such, both long-term and short-term erosion and sedimentation rates within the river can also be influenced by the design of the bridge piers. Similarly, bridge piers have a large potential impact on ice jam formation and separation and, therefore, need to be designed to combat these forces to reduce the risk of spring flooding.

The design of the bridge will consider potential impacts that may occur during a regional flood event, such that capacity is maintained to convey flows during a regional storm event without adversely affecting upstream flood elevations.

Hydrological assessments are anticipated to be required for the design of the piers for the new bridge to understand the risks for the structure as well as impacts on navigation and sediment transport from potential changes in the water flow and velocity. This assessment will provide guidance in the selection and configuration of coffer dams, if needed in the construction stages, as well as approaches to reduce impacts and provide direction on mitigation needed to isolate the construction areas. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and discuss appropriate mitigation strategies.

Once the bridge design is advanced and construction activities and methods are determined, potential significant negative impacts on water temperature and flow levels in the vicinity of the bridge will be further evaluated, along with linkages to other potential impacts (disturbances to aquatic species, erosion of riverbank, etc.).

#### 15.1.4.1.2 Operation

During operation, changes in water quality due to the Project is not anticipated to be any different from existing conditions.

The new bridge is anticipated to have a solid deck with appropriate stormwater management systems that will contribute to reducing the potential for release of contaminants to the river. Operation of the new bridge is therefore not expected to have significant adverse impacts.

Table 15-5 identifies, for each project stage, the physical activities that might interact with Drainage and Surface Water and result in the identified environmental impact.

**Table 15-5: Project interactions with drainage and surface water**

Project Stage	Physical Activities	Potential Impacts
		Change in surface water quality and quality
<b>Deconstruction</b>	Deconstruction of infrastructures	✓
<b>Construction</b>	Site mobilization and construction of temporary facilities	✓
	Land clearing and soil stripping	✓
	Excavation, earthwork	✓
	Construction of infrastructure	-
	Work in aquatic environments	✓
	Deconstruction of temporary structures	✓
	Demobilization of construction site	✓
<b>Operation</b>	Use of infrastructure	-
	Maintenance and repair of infrastructure	-
<b>NOTES:</b>		
✓ = Potential interaction		
- = No interaction		

#### 15.1.4.2 Mitigation and Protective Measures

Working in and around watercourses requires adequate planning, design and environmental mitigation. Improper measures can result in harmful effects to aquatic habitats, fish populations, wildlife (e.g., mammals, amphibians, waterfowl, etc.), water quality and watercourse dynamics.

An Environmental Protection Plan (EPP) (see Section 22) will be developed by the construction team for the Project. The EPP will outline the proposed environmental protection measures and commitments to be carried out by the contractor during construction to avoid or reduce potential effects. The IPT will work with interested Indigenous groups to include their interests and environmental knowledge in the Project. This effort will include ongoing consultation, the participation of Indigenous communities in studies, and discussion of potential mitigation options.

An Erosion and Sediment Control (ESC) Plan (see Section 22.4) will be developed, implemented and enforced during construction to reduce potential impacts on water quality. The ESC Plan will include a multi-barrier approach defining the location and design of control mechanisms such as silt fencing, rock check dams, straw bale filters, drain covers, filter fabric under catch basins frame and gates and mud mats, as required.

Environmental monitoring will be implemented to confirm appropriate mitigation measures are in place, maintained and functioning during the construction stage. A qualified Environmental Inspector will be

present during site set-up, in-water works, site restoration and during sensitive activities or immediately following major runoff events.

The qualified inspector will have the skills, knowledge and experience to assess conditions at the site that have the potential to impact water quality and the environment. This includes being knowledgeable in the principles and practice of ESC and pollution prevention. The Environmental Inspector will undertake the following:

- Visually inspect ESC measures, cofferdams, turbidity curtains, stockpiles, dewatering, and restoration activities for compliance with environmental monitoring plans and criteria. Photographs will be taken to document observations.
- Monitor turbidity upstream and downstream of the work zone(s) and compare against monitoring criteria to confirm there are no increases as a result of Project construction. Turbidity monitoring will occur if there is dewatering discharge entering the river or during active in-water works construction. The monitoring should be carried out at a minimum frequency of twice per day during these activities.
- Provide recommendations to the site representative should potential issues be noted.
- Complete a daily inspection report at the conclusion of inspection duties.

ESC measures will be implemented and maintained throughout all stages of construction to protect the receiving waters and surrounding environment. ESC measures should be installed around the extent of the construction work zone(s) as well as around the perimeter of stockpiles required for construction. ESC structures should be monitored to maintain their effectiveness through the life of construction and post-construction rehabilitation. If the erosion is resulting from a construction related activity, the activity should be halted immediately until the situation is rectified. All activities, including maintenance procedures, should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious (harmful) substances into the water. Even with ESC measures, extreme precipitation events could result in collapse of silt fencing, overflow or bypass of barriers, and other situations which could lead to erosion. Work should be limited or stopped during and immediately following significant precipitation events (i.e., 100-year storm event), and the measures should be inspected, at the discretion of on-site environmental personnel.

Surface soil erosion can occur in the absence of vegetative cover. Slope stability should be reviewed at watercourse edges. ESC and stabilization measures should be maintained during construction, restoration, and rehabilitation until vegetative cover is established. Where evidence of erosion exists, corrective control measures should be implemented as soon as conditions permit.

During construction, another risk to surface water quality is the potential for a contaminant spill during a large storm event. To address this concern, the following mitigation measures are proposed:

- Refueling of equipment should be undertaken at a minimum distance of 50 m from the Ottawa River to reduce potential impacts to surface water in the event that an accidental spill occurs.
- If a 50 m refueling minimum distance is not possible, under approval from on-site environmental personnel, special refueling procedures for sensitive areas should be undertaken that include, at a minimum, using a two-person refueling system with one worker at each end of the hose.

To reduce the impact of potential contaminant spills, the contractor will implement spill management protocols such as secondary containment of any temporary fuel storage and preparation of a spill response plan. This will include providing spill containment kits on site in designated locations where risk of spill is deemed the greatest (e.g., refueling areas). Mitigation measures for spill response are preliminarily described in Section 22.2. These measures will be further developed at the detailed design stage of the Project.

Discharge from dewatering/unwatering activities must be treated, if necessary, and released to the environment at least 30 m from local watercourses or wetlands and allowed to drain through a well-vegetated area. Water quality will be compared against the Canadian Council of Ministers of the Environment (CCME) *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CWQG-FAL) (CCME, 2012). If this is not possible based on site layout constraints, additional implementation of ESC measures will be considered. This consideration will be further reviewed during the development of the EPP and ESC plans to establish conditions and mechanisms where such exceptions may be considered. Where feasible, dewatering effluent should not be sent directly to any watercourse, wetland or waterbody, or allowed to drain onto disturbed soils within the work area. These control measures should be monitored for effectiveness and maintained or revised to meet the objective of preventing the release of sediment-laden water.

In the case of dewatering a cofferdam (i.e., surrounding bridge piers where direct discharge to the Ottawa River cannot be avoided), a turbidity curtain would be installed around the perimeter of the in-water work zone and water could be pumped from the dry work zone into this cordoned area within the confines of the turbidity curtain. Turbidity monitoring would be implemented to confirm the turbidity curtain is functioning as intended and not releasing turbid water to the Ottawa River.

Prior to being deconstructed, the existing concrete piers should be isolated from the stream flow. Pier deconstruction and removal will require the use of cofferdams and/or turbidity curtains to contain the construction waste. Similarly, cofferdams or equivalent will be required when installing the new bridge piers to create a dry work zone for curing the concrete.

Although not yet finalized, the design of the bridge deck will also take into consideration the use of salt and sand as road de-icers in winter months. Although paved decks increase the imperviousness of the structure, they are able to better capture, and control bridge runoff compared to the existing steel-grate deck. The proposed bridge deck will also incorporate stormwater management features to direct runoff from the bridge surface to limit the potential contaminants from directly entering the Ottawa River. The location of the near shore piers and overall bridge footprint will not decrease the width of the river at the bridge crossing. If the bridge design narrows/contracts the river, this can cause changes in flow patterns possibly leading to increased erosion and scour within the vicinity of the bridge.

The stormwater management system will be developed in later stages of the Project. This will include details on stormwater discharge monitoring, including location, frequency, duration, and volume, among other measures. The details of the bridge stormwater management (SWM) system will be developed and discussed during the preliminary design phase and refined during the detailed design phase. As is done in typical bridge SWM systems, it is recommended that the bridge SWM system include catch basins distributed along the length of the bridge built into the road deck. These catch

basins will collect surface runoff from the bridge deck. The catch basin design could consider the use of Goss traps at the outlet of each catch basin.

This style of inverted outlet design will create a permanent pool within each basin that is able to collect sediments in the bottom of the basin and trap potential floatables (such as hydrocarbons) on the surface of the permanent pool. Bridge catch basins are typically drained directly to the watercourse below. Bridge stormwater discharge is a very small volume in relation to the flow of the Ottawa River. As such, any resulting water quality effect from stormwater discharge is expected to be negligible.

Post-construction (operational) bridge stormwater discharge monitoring is not proposed as it is not a typical practice for the construction of bridges. During construction, water quality will be checked by monitoring for turbidity (monitor upstream baseline and downstream turbidity) to assess stormwater quality effects during ground disturbance and in-water works. During construction, disturbed area runoff will be contained within an ESC area(s). Construction based stormwater runoff will be captured, retained and released through sedimentation features such as filter bags, sedimentation basins/traps and perimeter silt/sediment fencing.

Similar to roadways, bridge decks can contain an array of contaminants due to their exposure to a variety of sources of contamination including but not limited to motorized sources, roadway substances, atmospheric inputs, construction activities, and maintenance activities (Bakr et al., 2020). As such, bridge contamination is a non-point source of contamination to receiving waterbodies. Review literature has identified common bridge and highway stormwater runoff contaminants to include heavy metals, inorganic salts, aromatic hydrocarbons, suspended solids, and vehicle-based compounds like oil, grease, rust, and rubber particles (Bakr et al., 2020). These contaminants are commonly produced or are by-products of the above sources. The concentrations and distribution of bridge contaminants can be affected by seasonality and rainfall frequency and intensity. (Bakr et al., 2020). There are potential SWM design considerations that can be implemented such as goss traps that can reduce the release of common contaminants such as metals in particulate form and suspended solids as well as light non-aqueous phase liquids (LNAPL) hydrocarbons. Mitigation of any salt effects would be limited to the road authority's application of salt, sand and other road de-icers in winter months, which should be in keeping with the Salt Management Plans of both Ottawa and Gatineau.

In developing the Accident and Malfunction Response Plan (see Section 22.1), the potential for environmental impacts associated with accidents and malfunctions will be assessed. The purpose of this assessment will be to identify plausible accidental events or malfunctions (i.e., spills resulting from refueling or accidental release during construction) that could occur as a result of the deconstruction of the existing bridge and construction of the new bridge. In the case of the Project, it is anticipated that the proposed spill response and mitigation measures will reduce the potential residual effects sufficiently to be considered insignificant. This assessment will be further refined and confirmed in the design phases.

Based on this preliminary assessment, residual impacts on surface water as a result of construction activities, following the implementation of mitigation measures, are likely to occur, but are predicted to be low in magnitude, extend to the LAA (200-m buffer around PDA), and short-term and reversible following construction activities.

#### **15.1.4.3 Enhancement measures**

Bridge replacement over a waterbody allows for potential creation of improved riverine habitat and shoreline restoration. A thorough assessment of the proposed bridge abutment design should be conducted to enhance the design so that riverbed scour around the abutments is decreased to the extent possible. Further, considering natural channel design principles and best practices during the design stages of the Project may provide potential to enhance the existing river shoreline and associated aquatic habitat. PSPC and NCC will consider enhancement measures in consultation with internal experts and experts from DFO.



## 15.2 Biological Setting

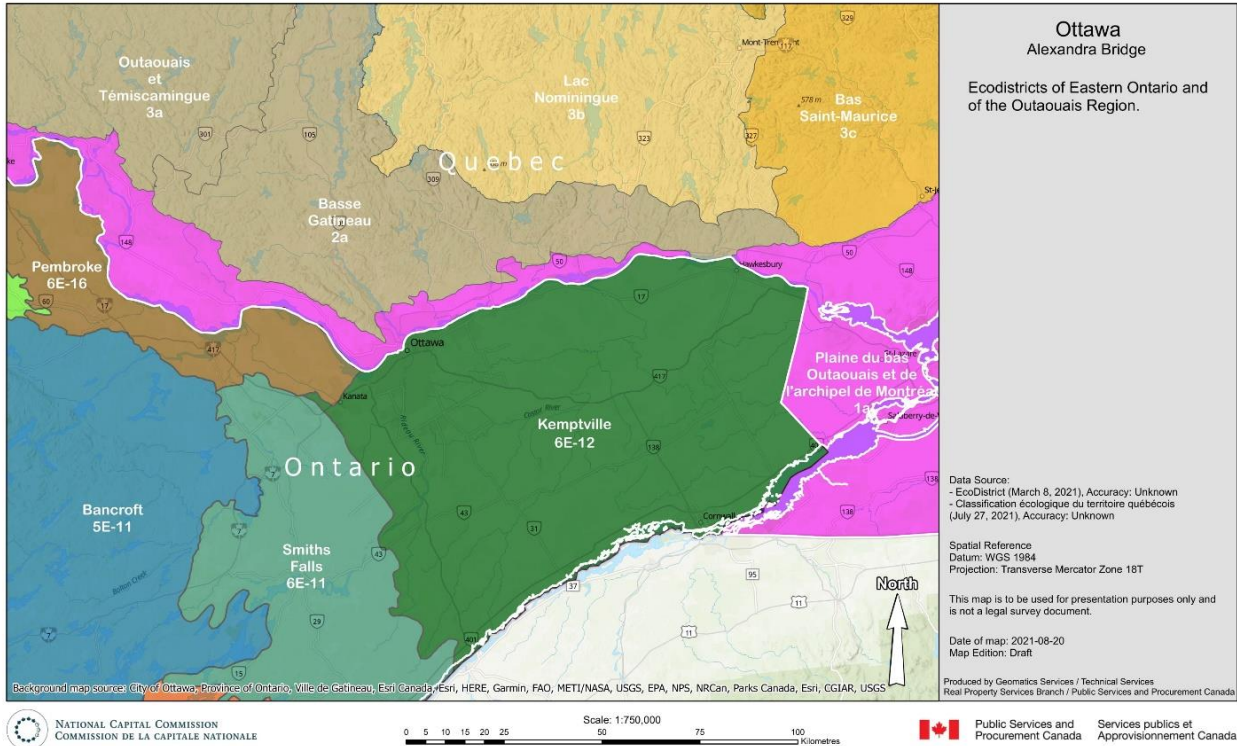
### 15.2.1 Vegetation

#### Ecodistricts, regional ecosystem and general vegetation of the Project area

The Project is located in the Upper St. Lawrence section of the Great Lakes-St. Lawrence Forest Region and the ecodistricts of the Basse Gatineau in Québec and Kemptville in Ontario (refer to Figure 15-3). The area is characterized by predominantly deciduous forests, dominated by sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), basswood (*Tilia americana*), white ash (*Fraxinus americana*), largetooth aspen (*Populus grandidentata*), red oak (*Quercus rubra*), and bur oak (*Quercus macrocarpa*). Other tree species occurring in the Upper St. Lawrence section include white oak (*Quercus alba*), green ash (*Fraxinus pennsylvanica*), grey birch (*Betula populifolia*), blue-beech (*Carpinus caroliniana*), and bitternut hickory (*Carya cordiformis*). White elm (*Ulmus americana*) is typically prominent in contemporary settled landscapes. Less frequent species in this section include butternut (*Juglans cinerea*), eastern cottonwood (*Populus deltoides*), slippery elm (*Ulmus rubra*), black maple (*Acer nigrum*), silver maple (*Acer saccharinum*), and black ash (*Fraxinus nigra*). Coniferous trees such as eastern hemlock (*Tsuga canadensis*), white spruce (*Picea glauca*), and balsam fir (*Abies balsamea*) occur frequently on shallow, acidic, or eroding materials. Eastern white pine (*Pinus strobus*), red pine (*Pinus resinosa*), black spruce (*Picea mariana*), and eastern white cedar (*Thuja occidentalis*) may be found where soil conditions are favorable (Rowe, 1972 Henson & Brodibb, 2005).







**Figure 15-3: Ecodistricts of Eastern Ontario and the Outaouais Region**

The riverfront lands and shoreline vegetation are an integral part of the Ottawa River’s vast ecosystem, which runs through Canada’s Capital Region. The river serves as an ecological corridor, particularly for fish habitat and shoreline wildlife, linking the riverfront lands within the PDA to the natural habitats located upstream and downstream of the Alexandra Bridge, including Leamy Lake Park, Gatineau Park, the river islands, the Deschênes Lake Important Bird Area (IBA) and several of the NCC’s Valued Natural Ecosystems and Habitats. The wooded areas along the riverfront are therefore part of a network of vegetation areas that are critical to wildlife, and these riverfront lands affect water quality and aquatic habitats. Thus, the natural components of the lands surrounding the PDA support the region’s resilience, promote biodiversity, provide natural habitats for many species, including potentially species at risk, and serve several ecological functions that are highly beneficial. These natural habitats must be protected and expanded, and their status improved, for example through planting to enhance the urban forest cover and strengthen the riparian strip. Management of these riverfront lands is part of the government’s efforts to support sustainable development and reduce the adverse environmental impacts of activities conducted on its properties (NCC, 2018b).

The lands within the proposed development footprint adjacent to the bridge are primarily cultural areas. The lands on the east side of the bridge on the Ontario side are described as parkland associated with Kîweki Point (formerly named Nepean Point), the National Gallery of Canada and Major’s Hill Park. Steep slopes to the Ottawa River are densely vegetated with early successional communities including ash (*Fraxinus* sp.) and sumac (*Rhus* sp.) to the south of the road and deciduous and conifer communities

along the embankment at the periphery of the grounds of the National Gallery of Canada. There are no nearby wetlands (Google, 2020).

The Quebec side adjacent to the PDA includes the Canadian Museum of History's lands, the NCC's Voyageur Pathway and Jacques-Cartier Park, which consists of clusters of manicured vegetation patches, trees, shrubs, gardens and pathways. Some invasive species were observed on the shoreline in Jacques-Cartier Park, approximately 350 meters north of the Alexandra bridge. These species include Manitoba maple (*Acer negundo*), purple loosestrife (*Lythrum salicaria*), reed canarygrass (*Phalaris arundinacea*), creeping yellow loosestrife (*Lysimachia nummularia*) and garlic mustard (*Alliaria petiolata*) (WSP, 2015).

#### 15.2.1.1 Plant Species at Risk

Plant species at risk (SAR) are defined as species that are protected under federal or provincial legislation, including species:

- Listed under Schedule 1 of the Species at Risk Act, (S.C. 2002, c.29) (SARA) as endangered or threatened (GOC 2020)
- Listed under the Ontario Endangered Species Act, 2007, (S.O. 2007, c.6) (ESA) as endangered or threatened (MECP 2020b)
- Listed under the Québec Act respecting threatened or vulnerable species, (c. E-12.01) (ARTVS) as threatened or vulnerable (MELCC, 2019; MFFP, 2019)

A wider group of species of management concern (SOMC) is also considered, which includes species:

- Listed under Schedule 1 of SARA as special concern (GOC, 2020)
- Assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as endangered, threatened or special concern (GOC, 2020) but not yet listed under SARA
- Listed under the ESA as special concern (MECP, 2020b)
- Listed under the ARTVS as likely to be designated as threatened or vulnerable (MELCC, 2019; MFFP, 2019)
- Ranked as S1 (Critically Imperiled), S2 (Imperiled) and S3 (Vulnerable) by Ontario's Natural Heritage Information Centre (MNRF, 2019)

Although there are many plant species at risk and of management concern in the Ottawa River area, there are relatively few occurrences in the vicinity of the Project, most likely as a result of the limited natural habitats and urban nature of the area. However, the following SAR have been observed within a 2 km radius of the PDA (NCC, 2021c):

- Butternut – Endangered status federally and in Ontario; likely to be designated as threatened or vulnerable in Quebec.
- Fragrant sumac (*Rhus aromatica var. aromatica*) - Vulnerable status in Quebec.
- Ostrich fern (*Matteuccia struthiopteris*) - Vulnerable status in Quebec<sup>2</sup>.

The plant SAR that are most likely to be found in the vegetated areas of the PDA and LAA are Butternut and Rock elm (*Ulmus thomasii*). In addition, ECCC notes the potential for American Ginseng (*Panax quinquefolius*) within the Project Area (ref. ECCC IPD Review). The area affected by construction will be surveyed to identify the potential presence of Butternut and Rock elm trees, as well as any other SAR plants.

### 15.2.1.2 Potential Impacts

#### 15.2.1.2.1 Deconstruction and Construction

Potential impacts on vegetation (including SAR/SOMC) and ecological communities resulting from the deconstruction of the existing bridge and construction of the new bridge include changes to community diversity (including community loss), changes to species diversity, and introduction or spread of invasive species through vehicle and equipment movement. These potential impacts would be localized in nature. Given that there are no wetlands in proximity to the PDA, no impacts on wetlands are anticipated as a result of the Project.

Activities related to construction, including vegetation clearing, stockpiling of materials, laydown areas, and excavation, may result in the removal and degradation of vegetation along the shoreline of the Ottawa River. While direct (i.e., due to removal or accidental damage) and incidental (i.e., due to compaction, erosion, spills or changes in the microclimate as a result of alterations to the tree canopy) disturbance of existing vegetation communities in the vicinity of the bridge abutments and staging/stockpiling areas are possible during construction, incidental disturbance to vegetation during operation are not anticipated. Given that this Project is a replacement of an existing structure, fragmentation of vegetation communities is not anticipated to be any greater than under existing conditions.

Due to the urban nature of the Project area, potential impacts to SAR plants are expected to be limited to harming individuals of a listed species. While impacts at a local population level are possible, they are not anticipated to negatively affect any given species' chances of survival or recovery.

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<sup>2</sup> The prohibitions referred to in Section 16 of the *Act respecting threatened or vulnerable species* do not apply to Ostrich fern, except as regards the annual harvesting from a wild population of more than 5 specimens. The prohibitions also do not apply if the specimens of a wild population are situated in a habitat that is to be irremediably altered as a result of the carrying out of a project authorized under the *Environment Quality Act* (see Section 5 of the *Regulation respecting threatened or vulnerable plant species and their habitats*).

Construction activities that may encroach on SAR plants, such as Butternut, Rock elm and American ginseng, will require site specific review prior to construction to confirm presence / absence of these species.

In addition, construction activities and machinery may introduce invasive species to the Project area during construction (i.e., seed transfer) or contribute to the spread of invasive plants and/or diseases (i.e., Butternut canker, fungal pathogens of American ginseng) already located within the PDA and LAA.

A more detailed assessment of the potential impacts of the Project on vegetation, including SAR and SAR habitat, will be completed based on the findings of future vegetation inventories (see section 15.2.1.3) and following the development of the initial design stages and construction methods.

#### 15.2.1.2.2 Operation

It is not anticipated that vegetation will be affected by the Project during operations.

Table 15-6 identifies, for each project stage, the physical activities that might interact with Vegetation and result in the identified environmental impact.

**Table 15-6: Project interactions with vegetation**

Project Stage	Physical Activities	Potential Impacts
		Change in vegetation communities and species
<b>Deconstruction</b>	Deconstruction of infrastructures	✓
<b>Construction</b>	Site mobilization and construction of temporary facilities	✓
	Land clearing and soil stripping	✓
	Excavation, earthwork	✓
	Construction of infrastructure	-
	Work in aquatic environments	-
	Deconstruction of temporary structures	-
	Demobilization of construction site	-
<b>Operation</b>	Use of infrastructure	-
	Maintenance and repair of infrastructure	-
<b>NOTES:</b>		
✓ = Potential interaction		
- = No interaction		

#### 15.2.1.3 Mitigation and Protective Measures

Field surveys will be conducted prior to the initial stages of design to identify the vegetation (including SAR/SOMC) and ecological communities within the PDA and any adjacent impacted lands. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant

federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required. After field surveys are conducted and a list of terrestrial vegetation and SAR is identified, species-specific mitigation measures and permit requirements will be confirmed, and a management approach will be developed. Detailed mitigation measures, the management approach and the need for and extent of any follow-up program will be confirmed and developed through the design process in discussion with permitting authorities.

Mitigation efforts will prioritize avoidance and protection of any SAR plants observed during the surveys. If it is determined that SAR plants are present and will be impacted, appropriate SAR permits will be obtained, and mitigation/compensation plans will be developed for the specific species to minimize or compensate for the adverse effects. In addition to replacement plantings, compensation measures could include exploring opportunities to transplant individual SAR from within the footprint of construction (where feasible), collecting and propagating seeds for future species restoration projects, and archiving of genetic material. If Butternut are likely to be affected by project activities, a Butternut health assessment may be required. Any works involving SAR plants that are susceptible to certain diseases may require special mitigation measures related to preventing the spread of these diseases (i.e., Butternut canker).

The limits of the construction footprint will be identified in the field, to allow for the protection of off-site natural areas and vegetation and to avoid incidental encroachment into adjacent areas. Limited clearing of vegetation may be required to facilitate construction activities. A detailed inventory of vegetation within the construction footprint and other impacted sites will be completed, and adequate compensation through replanting and/or financial contributions to various enhancement measures such as habitat restoration will be required, in accordance with the NCC Forest Strategy (NCC, 2021b).

Storage of construction materials or equipment should not occur within the critical root zone<sup>3</sup> of any tree species in the PDA and LAA to avoid impacting potential habitat areas not directly affected by the Project footprint. Any emissions from machinery should be directed away from foliage and vegetation.

A pre-construction survey of the development footprint of the Project and adjacent impacted lands will be undertaken to confirm the presence or absence of invasive plants. An invasive species management plan will be developed as part of the EPP to mitigate the spread of invasive species. All equipment, including mats, must arrive at the Project site clean and free of soil or vegetative debris. Any equipment, including mats, which do not arrive in appropriate condition shall not be allowed on the construction site until it has been cleaned, and deemed suitable for use. Any granular material being used on-site must be free from contamination from invasive plants (seeds, plant fragments), and all plant material

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<sup>3</sup> The critical root zone (CRZ) extends to the dripline of the tree canopy or 12 times the diameter at breast height (DBH in cm) of the tree, whichever is greater.

must be native and non-invasive. Removal and disposal of invasive species that may be present within the limits of the construction footprint or adjacent impact lands will follow current best-management practices to minimize the risk of spreading these species to new areas. Any follow-up and monitoring plans will be developed for VCs where residual adverse effects are predicted or uncertain.

The DPD provides a preliminary assessment that is based on publicly available information that will need to be confirmed with vegetation studies and as the Project design progresses and more detailed information becomes available, improving the level of certainty associated with impact assessment predictions. If required, a follow-up and monitoring plan will be implemented during relevant Project phases to verify the accuracy of predictions and determine the effectiveness of proposed vegetation mitigation measures at representative sensitive receptors.

Based on this preliminary assessment, residual impacts of the Project on vegetation, following the implementation of mitigation measures, are likely to occur and may extend to the LAA (100 m buffer around PDA) but are predicted to be low in magnitude, localized, short-term and reversible following post-construction reclamation.

#### **15.2.1.4 Enhancement measures**

Determining appropriate compensation measures for vegetation removal is complex and depends on many factors including the size of the trees, the context of the site and the potential impacts on ecological functions (NCC, 2021b). Any trees to be removed will be compensated at a minimum ratio of 2:1, however a higher ratio or a monetary value may be required to compensate for the loss of larger trees. Compensation for the loss of vegetation other than trees may also be required. Tree planting and habitat restoration plans will be developed using only native, non-invasive species. The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.

### **15.2.2 Wildlife and Wildlife Habitat**

#### **15.2.2.1 General Wildlife and Wildlife Habitat**

The Project is located in an urban area and, as such, wildlife in the area is represented by species typical of urban zones. These include mammals such as bats, rabbits, hares, squirrels, beavers, muskrats and raccoons (DST, 2003). Various bird species may nest on the bridge structure (see section below for more details on specific species). The urban landscape with limited vegetation communities does not support a high diversity or abundance of wildlife. Surveys are planned for 2023 where methodology and results will be detailed, however the information provided in this report is based on publicly available information for the area.

The Ottawa River provides important habitat for waterbirds (e.g., Black Duck [*Anas rubripes*], Northern Pintail [*Anas acuta*], American Wigeon [*Mareca americana*]) and supports large numbers of migrating species in the spring and fall, including Canada Geese (*Branta canadensis*), Hooded Mergansers (*Lophodytes cucullatus*), Common Goldeneye (*Bucephala clangula*), and Northern Shoveler (*Spatula clypeata*) (Haxton & Chubbuck, 2002).

### 15.2.2.2 Species at Risk

Wildlife species at risk (SAR) are defined as species that are protected under federal or provincial legislation, including species:

- Listed under Schedule 1 of SARA as endangered or threatened (GOC, 2020)
- Listed under the ESA as endangered or threatened (MECP, 2019)
- Listed under the ARTV as threatened or vulnerable (MELCC, 2019; MFFP, 2019)

A wider group of species of management concern (SOMC) is also considered, which includes species:

- Listed under Schedule 1 of SARA as special concern (GOC, 2020)
- Assessed by COSEWIC as endangered or threatened, or special concern (GOC, 2020) but not yet listed under SARA
- Listed under the ESA as special concern (MECP, 2020b)
- Listed under the ARTVS as likely to be designated as threatened or vulnerable (MELCC 2019; MFFP, 2019)
- Ranked as S1 (Critically Imperiled), S2 (Imperiled) and S3 (Vulnerable) by Ontario's Natural Heritage Information Centre (MNRF, 2019)

As part of the desktop screening, the following background documentation and provincial/federal information sources were reviewed to identify SAR and SOMC near the Project area:

- Natural Heritage Information Centre (NHIC Ministry of Natural Resources and Forestry [MNRF] 2020b)
- Land Information Ontario (LIO MNRF, 2020a)
- Satellite Imagery (Google, 2020)
- Species at Risk Public Registry (GOC, 2020)
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map (DFO, 2019a)
- Species at Risk in Ontario (SARO) (MECP, 2020b)
- Ontario Breeding Bird Atlas (OBBA) (Cadman et al., 2007)
- Atlas of Mammals of Ontario (AMO) (Dobbyn, 1994)
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature, 2019)
- Ontario Butterfly Atlas (OBAO) (Toronto Entomologists' Association 2020)
- iNaturalist (2020)
- eBird (2021)
- Centre de données sur le patrimoine naturel du Québec (CDPNQ) (CDPNQ, 2020)
- Quebec Breeding Bird Atlas (Robert et al., 2019)
- Report titled "Review of the historical and existing natural environment and resource uses on the Ottawa River" (Haxton & Chubbuck, 2002)
- City of Ottawa Species List (City of Ottawa, 2021b)
- Club des ornithologues de l'Outaouais (COO, 2021)

Some of these sources provide data at a scale as large as 10 x 10 km (i.e., OBBA, ORAA, OBAO). Results were therefore screened to assess if there was the potential for suitable habitat within the Project area based on satellite imagery. If no suitable habitat was observed on the satellite imagery, the species were not considered as potentially present in the Project area (i.e., grassland species were removed).

A request for information for SAR and SOMC records near the Project area was returned from the CDPNQ September 22, 2020 and included records for three species within 1 km of the Alexandra Bridge: the Northern Map Turtle (*Graptemys geographica*), the Silver-haired Bat (*Lasionycteris noctivagans*) (historical occurrence) and the Spiny Softshell Turtle (*Apalone spinifera*) (historical occurrence) (CDPNQ, 2020). Agency consultation in Ontario has moved to a proponent-driven process for the provincial agency responsible for SAR (i.e., MECP) and proponents are directed to review the background documentation and related information sources outlined above. As such, specific information request packages were not submitted at this time for provincially designated features and/or SAR in Ontario.

As with the plant species at risk, although there are wildlife SAR and SOMC in the Ottawa River area, there are relatively few occurrences in the Alexandra Bridge area, most likely a result of the limited vegetation communities and associated wildlife habitat. However, several SAR and SOMC have been observed within a 2 km radius of the PDA, including (NCC, 2021c):

- Bank Swallow (*Riparia riparia*) - Threatened status federally and in Ontario
- Barn Swallow (*Hirundo rustica*) - Threatened status federally and in Ontario
- Chimney Swift (*Chaetura pelagica*) - Threatened status federally and in Ontario; likely to be designated as threatened or vulnerable in Quebec
- Eastern Wood-pewee (*Contopus virens*) - Special concern status federally and in Ontario
- Monarch (*Danaus plexippus*) - Special concern status federally and in Ontario
- Northern Map Turtle - Special concern status federally and in Ontario; vulnerable status in Quebec
- Northern Watersnake (*Nerodia sipedon sipedon*) - Likely to be designated as threatened or vulnerable in Quebec
- Snapping Turtle (*Chelydra serpentina*) - Special concern status federally and in Ontario

SAR and SOMC could therefore potentially be present near the Alexandra Bridge if there is suitable habitat.

Various bird species may nest on or adjacent to the bridge structure, including bird SAR (e.g., Barn Swallow, Bank Swallow, Chimney Swift, Common Nighthawk [*Chordeiles minor*], and Peregrine Falcon [*Falco peregrinus anatum / tundrius*]), and other migratory birds (e.g., Eastern Phoebe [*Sayornis phoebe*], Cliff Swallow [*Petrochelidon pyrrhonota*]). The nearby vegetation may also support nesting birds.

Although not anticipated, bat SAR roost habitat may be present in trees in the development footprint. Further assessment of those trees that may be scheduled for removal will be required. SAR bats may use trees as small as 10 cm diameter at breast height (DBH) with cavities, loose bark, and leaves to nest and day roost as well as for maternity roosting purposes, usually >10 metres high on trees exhibiting early stages of decay (ECCC, 2018b MNR, 2015). Additionally, these species are known to use anthropogenic structures for roosting as well (e.g., buildings, crevices under bridges (such as expansion joints, hinge



joints, stress cracks, etc.) (Fraser, 2019)). SAR bats, in particular the Eastern Small-footed Myotis (*Myotis leibii*), the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*) and the Tri-coloured Myotis (*Perimyotis subflavus*), may roost during the summer months under the bridge or in rock outcrops associated with the Kiwèkì Point (formerly named Nepean Point). Bat exit surveys (visual and acoustic ) during the months of June and July are proposed to confirm presence/absence of the SAR species (see Table 15-9).

The PDA and LAA contain suitable habitat for SAR turtles and snakes. The MEFCCWP has identified this reach of the Ottawa River as potential habitat for the Spiny Softshell due to historical occurrences, with potential habitat for the Northern Map Turtle found approximately 1 km downstream and 2 km upstream of the Alexandra Bridge. Critical habitat for the Blanding's Turtle (*Emydoidea blandingii*) has been identified by ECCC approximately 1.5 km to the south of the PDA. In addition, ECCC notes the potential for Eastern Musk Turtles (*Sternotherus odoratus*) to occur within the Project Area (ref. ECCC IPD Review). SAR and SOMC turtles, such as the Northern Map Turtle, Spiny Softshell, Snapping Turtle and Midland Painted Turtle (*Chrysemys picta marginata*) may be encountered basking along the shoreline, on exposed rocks or trees, and/or at the base of the bridge. The Ottawa River may also be used as foraging and overwintering habitat and/or as a movement corridor.

Turtles may be encountered as they migrate across upland habitats to search for breeding ponds and are at increased risk of mortality from vehicles and predators as they travel overland to nesting habitats (MNRF 2013).

SAR snakes such as Eastern Milksnake (*Lampropeltis triangulum*) and Northern Watersnake (*Nerodia sipedon sipedon*) may be encountered basking along the shoreline, on exposed rocks or trees, and/or at the base of the bridge. The Project area may also be used as foraging habitat with Eastern Milksnake hunting for small rodents and amphibians along the forest edge and Northern Watersnake hunting for fish and amphibians in the river (Ontario Nature ,2019).

The Ottawa River also provides habitat for many species of amphibians. Most amphibians use the river and its riparian areas during certain phases of their lifecycle, whereas some, such as the Common Mudpuppy (*Necturus maculosus*), are strictly aquatic and rely on the river year-round (ORHDC, 2005). Species such as the Spring Peeper (*Pseudacris crucifer*), American Bullfrog (*Lithobates catesbeianus*), Green Frog (*Lithobates clamitans*), Northern Leopard Frog (*Lithobates pipiens*), Gray Treefrog (*Dryophytes versicolor*), American Toad (*Anaxyrus americanus*), Eastern Red-backed Salamander (*Plethodon cinereus*) and Blue-spotted Salamander (*Ambystoma laterale*) are found within the river's watershed (iNaturalist, 2022; ORHDC, 2005). The Western Chorus Frog (*Pseudacris triseriata*), a species designated as threatened federally and vulnerable in Quebec (in the process of being designated as threatened), has been observed in a small number of vernal pools in the lac Leamy sector and the Pickerel Frog (*Lithobates palustris*), a species likely to be designated as threatened or vulnerable in Quebec, has been observed in swamps and forests along the river approximately 4km upstream from the Chaudière Dam (NCC, 2022).

With respect to terrestrial invertebrates, Monarchs may be encountered in open areas and along roadways where milkweed (*Asclepias* sp.) is found. In addition, ECCC notes the potential for Yellow-banded Bumble Bees (*Bombus terricola*) to occur within the Project area (ref. ECCC IPD Review). This species may be encountered foraging on a variety of flowers, or nesting or overwintering in underground cavities and rotten logs (COSEWIC, 2015).

### 15.2.2.3 Potential Impacts

#### 15.2.2.3.1 Deconstruction and Construction

Several of the deconstruction and construction activities (habitat destruction or alteration, disturbance from noise, dust, presence of machinery, etc.) have the potential to cause adverse effects on terrestrial wildlife, including SAR/SOMC, and wildlife habitat that may be present in the Project area.

Bird SAR and migratory birds are vulnerable to disturbances during the breeding season (between April 8 and August 28 for the PDA, although nesting also infrequently occurs outside of this period) (ECCC 2018a). Bridge deconstruction and construction may disrupt nesting opportunities for some migratory birds and bird SAR either through removal of existing nests or disturbance of nesting habitat. Direct disturbances include vegetation removal (i.e., tree clearing) and construction activities (i.e., deconstruction of the bridge), which may result in the destruction of nests and/or eggs. Incidental disturbances include sensory disturbances associated with construction activities (i.e., noise, vibrations, and light) which may lead to nest abandonment. Disturbance impacts may be temporary (i.e., noise, vibrations and lighting during deconstruction and construction) or permanent (i.e., due to vegetation removal, bridge lighting and/or if the design of the replacement structure does not provide nesting habitat). Birds (including SAR) nesting on the bridge structure, such as Barn Swallow and Eastern Phoebe, and in nearby vegetation may be impacted.

The same is true for any SAR bats that may be using the existing bridge or nearby vegetation for roosting (from April 1 up to September 30; to be confirmed with federal and provincial agencies), with deconstruction and tree removal disrupting or removing suitable habitat (either temporarily or permanently, depending on the future bridge design) and sensory disturbances leading to the abandonment of maternity/roosting sites or hibernacula.

Activities during deconstruction and construction have the potential to result in direct and incidental effects on turtles as a result of construction noise and disturbance (i.e., increased turbidity in the water, changes to water flow and sediment transport regimes, increased human activity causing turtles to abandon the area, alteration to nesting or basking sites), or direct mortality through contact with construction equipment and/or the loss of habitat. Excavation activities also have the potential to result in the destruction of nests and/or overwintering habitat. Turtle nesting typically takes place between mid-May and late July, with eggs remaining in the nest until September or October (or in some cases, overwinter).

Construction activity can result in direct mortality to snakes, which are vulnerable during emergence from a hibernaculum, re-entrance, and basking periods, and may seek out construction materials to bask under. The Project may also have direct or incidental impacts on nesting sites and hibernacula, either through destruction of habitat or disturbance leading to abandonment of the area, while changes to water flow and sediment transport regimes may impact the aquatic Northern Watersnake. Potential impacts will be further assessed and confirmed as Project design progresses.

Potential direct and incidental impacts on amphibians may result from contact with construction equipment during the terrestrial and aquatic phases of their lifecycle, fragmentation, modification or loss of breeding, feeding and overwintering habitats and dispersal pathways, changes to water flow, and modification of riparian areas. Similarly, invertebrates may experience direct impacts from contact with equipment and incidental impacts from the modification or destruction of foraging, nesting and overwintering habitats.

Wildlife potentially present adjacent to the active construction site are species that are already acclimatized to the disturbed urban environment and impacts to these species from increased noise and lighting are expected to be low. Due to the urban nature of the Project area, potential impacts to SAR wildlife are expected to be limited to harming individuals of a listed species. While impacts at a local population level are possible, they are not anticipated to negatively affect any given species' chances of survival or recovery.

Limited vegetation clearing may be required to facilitate construction activities, which may also affect nests or habitat of migratory birds, potential SAR bat maternity roost tree habitat and habitat for common urban wildlife species.

A more detailed assessment of the potential impacts of the Project on terrestrial wildlife, wildlife habitats and local population, including SAR/SOMC and migratory birds, will be completed based on the findings of future wildlife surveys (see Section 15.2.2.3) and following the development of the initial design stages and construction methods.

#### 15.2.2.3.2 Operation

During operation, changes in wildlife habitat as a result of the Project may occur as a result of use of the infrastructure and maintenance/repair activities. Noise levels are expected to be similar to those under current conditions and any vegetation or habitat removal resulting from the Project will have occurred during construction.



Table 15-7 identifies, for each potential impact, the physical activities that might interact with Wildlife and Wildlife Habitat and result in the identified environmental impact.

**Table 15-7: Project interactions with wildlife and wildlife habitat**

Project Stage	Physical Activities	Potential Impacts	
		Change in habitat	Change in mortality risk
<b>Deconstruction</b>	Deconstruction of infrastructures	✓	✓
<b>Construction</b>	Site mobilization and construction of temporary facilities	✓	✓
	Land clearing and soil stripping	✓	✓
	Excavation, earthwork	-	-
	Construction of infrastructure	-	-
	Work in aquatic environments	-	-
	Deconstruction of temporary structures	✓	✓
	Demobilization of construction site	-	-
	<b>Operation</b>	Use of infrastructure	✓
Maintenance and repair of infrastructure		✓	✓
<b>NOTES:</b> ✓ = Potential interaction - = No interaction			

#### 15.2.2.4 Mitigation and Protective Measures

Wildlife and wildlife habitat protection and mitigation measures will be included as a component of the EPP to identify specific wildlife protection measures to be implemented during construction. This plan will include a variety of measures to be implemented during design and construction of the Project, such as adherence to wildlife timing windows, species monitoring, and wildlife handling protocols.

Field surveys will be conducted prior to the initial design stages to identify the presence of wildlife (including SAR/SOMC) and wildlife habitat (including aquatic, semi-aquatic, riparian and terrestrial habitats) within the PDA and any adjacent impacted lands, as well as to develop a more complete understanding of the likelihood of breeding, migration, and overwintering use by SAR (including bats), migratory birds, reptiles, amphibians and invertebrates and the annual variation in SAR occurrence and/or habitat use within the Project area. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous

communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.

After field surveys are conducted and a list of terrestrial/semi-aquatic species and SAR/SOMC are identified, species-specific mitigation measures and permit requirements will be confirmed, and a management approach will be developed. The need for and extent of any follow-up program will be confirmed and developed through the design process. Detailed mitigation measures, the management approach and follow-up programs will form part of the EEP.

Detailed design of the construction area will be reviewed to avoid and minimize impacts on wildlife habitat and vegetated areas to the extent possible. Where possible, wildlife timing windows will be respected to avoid disturbance to wildlife during the breeding season. If work during critical timing windows is unavoidable, appropriate exclusion measures will be implemented. If necessary, alternative nesting/roosting structures may be constructed. Long-term impacts to wildlife will also be considered in the design of the new bridge.

If work is scheduled to take place during the bird breeding season, which is generally from April 8 – August 28 in the Ottawa area (ECCC, 2018a), a breeding bird survey will be completed. A qualified avian biologist will conduct a pre-construction survey to identify the presence of migratory or SAR bird nests on the bridge and in areas identified for vegetation removal. If migratory birds or SAR are found nesting in the Project area, consultation will be undertaken with ECCC and/or MECP/MNRF and/or MEFCCWP prior to commencing work. If migratory or SAR bird nests are identified in proximity to construction/rehabilitation activities within the work area, construction activities near the nest will cease until ECCC/MECP/MNRF/MEFCCWP can be contacted for advice. Nests will not be removed from the bridge without consulting an avian biologist and issuance of a SARA and/or *Migratory Birds Convention Act, 1994* (MBCA) permit and/or relevant provincial permit, if required, from the ECCC/MECP/MNRF/MEFCCWP.

Construction activities with the potential to remove migratory bird habitat, such as bridge deconstruction and vegetation clearing, will be avoided to the extent possible during the breeding season. If under-bridge work is proposed during this period, exclusionary measures (e.g., netting, bioacoustic deterrence) will be installed prior to April 1 to deter nesting on the bridge following guidance outlined in *Best Management Practices for Excluding Barn Swallows and Chimney Swifts from Buildings and Structures* (MNRF, 2017a). The exclusion netting would be regularly inspected and maintained in good repair. Geese may be temporarily deterred from the Project area during construction using measures identified in section 7 of the *Canada and Cackling Geese: Management and Population Control in Southern Canada Handbook* (CWS, 2010). Some of the deterrent measures may require a permit from ECCC, which will be the responsibility of the contractor and will be secured prior to implementation. If vegetation clearing is required during this period, an avian biologist will be retained to search suitable areas prior to work. The biologist will search for nests to manage risks to active nests protected by the MBCA, the SARA, the ESA, the ARTVS, the Ontario *Fish and Wildlife Conservation Act, 1997* (FWCA) and the Quebec *Act respecting the conservation and development of wildlife* (ARCDW). Nest searches must be completed within 48 hours before commencement of the proposed works. If work is not completed within 48 hours following the nest search, the search will be repeated to search for new nests that may have been established during that period.

If Barn Swallow nests are observed on the bridge, and deconstruction activities cannot be completed outside the breeding season, Barn Swallow nesting structures would be installed near the PDA prior to deconstruction of the existing bridge to compensate for the loss of nesting habitat under the bridge (see *Creating Nesting Habitat for Barn Swallows*; MNRF, 2016b). These structures would be installed before the onset of the active nesting season.

As many birds migrate at night, navigating by the moon and stars, artificial light can cause disorienting and confusing signals, drawing birds into the lights. Given that the Ottawa River is designated as a dark sky zone as per the National Capital Illumination Plan (NCC, 2017a), any lighting for the replacement bridge will consider this designation, as well as the NCC Bird-Safe Design Guidelines (NCC, 2021a) and the City of Ottawa's Bird-friendly Design Guidelines (City of Ottawa, 2021a).

As mentioned in section 15.2.2.2, bat roost/maternity exit surveys are proposed to confirm the presence/absence of SAR species. Maternity exit surveys are conducted during evening hours and include visual and acoustic surveys following industry standard, accepted protocols as outlined by MNRF (MNRF, 2014; MNRF, 2017b) and MFFP (2021). Surveys are conducted during the maternity roost season in June and July and begin at sunset and continue for 90 minutes. A handheld recorder is used to identify the bat species by their calls. If bats are observed entering or exiting a tree or the bridge it is assumed that the habitat is being used for roosting. If work is anticipated to impact SAR bats, a permit under SARA/ESA/ARTVS may be required. In the event that a SAR bat maternity roost is identified (i.e., within a tree or in/around the bridge structure) during the baseline studies, ECCC/MECP/MEFCCWP will be contacted for further guidance.

To mitigate disturbance or potential harm to any roosting bats confirmed through the proposed bat surveys, any tree clearing and construction/deconstruction activities on the bridge would be completed outside the roosting timing window for bats (from April 1 up to September 30; to be confirmed with federal and provincial agencies). If avoidance is not possible during bridge deconstruction, the installation of 3/8" netting prior to the roosting season would be required to prevent bats from roosting on the bridge structure (Fraser, 2019). This exclusion netting would also serve to exclude migratory birds from the structure and would be regularly inspected and maintained in good repair.

If bat roosting is observed on the bridge, and deconstruction activities cannot be completed outside the summer roosting, alternative roosting structures as recommended by ECCC/MECP/MEFCCWP would be installed near the PDA prior to deconstruction of the existing bridge to compensate for the loss of roosting habitat under the bridge. These structures would also be installed before the onset of the active roosting season.

Where SAR turtle, snake and/or amphibian habitat is confirmed during site investigations, mitigation measures would be developed in consultation with ECCC, MECP and MEFCCWP. Examples of standard mitigation to keep reptiles and amphibians out of construction areas include the installation of an exclusion fence designed in accordance with the *Best Practices Technical Note – Reptile and Amphibian Exclusion Fencing* (MNRF, 2013). In addition, a reptile and amphibian salvage and relocation plan will be developed to deal with any animals encountered within the construction area.

With respect to turtles specifically, the exclusion fencing would need to be installed prior to the beginning of the nesting season (by end of April at the latest) and be maintained around the work area

for the duration of the turtle active season (mid-April to end of October).

If construction occurs during the spring, summer or fall (i.e., peak active season for herptiles: April 1 through October 31), potential snake cover (i.e., old boards, logs, construction debris) would be removed by hand and any snakes found underneath given the chance to leave without being harassed. Additionally, drivers and equipment operators should watch for basking snakes on the road.

Where feasible to do so, the timing of deconstruction and construction activities will also be scheduled to avoid or minimize potential impacts on amphibians and their habitats during sensitive phases of their lifecycle (i.e., breeding, migration/dispersal, overwintering).

If work is conducted during the Monarch breeding season (May to October), areas of high milkweed density will be avoided. Post-construction habitat restoration efforts will include considerations for pollinators, such as the restoration or creation of native foraging habitat for species such as the Monarch and the Yellow-banded Bumble Bee.

Visual searches during deconstruction and construction will include inspection of structures, machinery and equipment, prior to starting equipment. If any wildlife is encountered during construction, work at that location will stop until the wildlife leaves the Project area of their own accord. Standard environmental protection measures for erosion and sediment control will be modified to serve as wildlife barriers where construction borders areas of natural vegetation (see the *Best Practices Technical Note – Reptile and Amphibian Exclusion Fencing* (MNRF, 2013)).

Any wildlife incidentally encountered during construction will not be knowingly harmed. Work will be conducted to not disturb habitat and/or individual SAR and migratory birds. Project activities will be planned to protect SARs and their habitats, which will include training workers in the identification of potential SAR they may encounter, and a protocol developed if a species is encountered.

Any follow-up and monitoring plans will be developed for VCs where residual adverse effects are predicted or uncertain. If required, a follow-up and monitoring plan would be implemented during relevant Project stages to verify the accuracy of predictions and determine the effectiveness of proposed wildlife and wildlife habitat mitigation measures at representative sensitive receptors.

Based on this preliminary assessment, residual impacts on wildlife habitat as a result of construction activities, potentially including SAR, following the implementation of mitigation measures, are possible (i.e., depends on the species and habitat present in the LAA), but are predicted to be low in magnitude (given the urbanized nature of the area), extend to the LAA (100 m buffer around PDA), are short-term in duration and reversible following post-construction reclamation. Through the implementation of habitat creation, restoration and other offsetting measures, impacts from this Project on wildlife and wildlife habitat to achieve net environmental benefits may be positive over the long-term.

#### **15.2.2.5 Enhancement measures**

Compensation for removal of SAR habitat may be required (e.g., with the installation of Barn Swallow nesting structures, bat boxes, etc.) and will be determined in consultation with ECCC/MECP/MEFCCWP. There are also opportunities to implement these wildlife habitat structures or other habitat restoration and enhancement measures to offset some of the past impacts of urban developments in this region. Finally, it may be possible to design the new bridge in a way that maintains or improves the conditions required for successful nesting and roosting on the structure. PSPC and NCC will work with the study

team and with agency experts from ECCC, MECP, MNRF and MEFCCWP to consider options to improve habitat for wildlife in the area. The IPT will also seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCCWP, etc.), and will engage Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.

#### **15.2.2.6 Potential changes to Migratory birds, as defined in subsection 2(1) of the Migratory Birds Convention Act, 1994**

Project implementation could result in changes to migratory birds, as defined in subsection 2(1) of the *Migratory Birds Convention Act*. There is a small amount of vegetated habitat within the anticipated Project Development Area. There is also potential for migratory birds to nest on the bridge structure. Clearing of vegetation and bridge deconstruction will preferentially be conducted outside of the breeding bird season (April 8 – August 28). Through the implementation of mitigation measures (see Section 15.2.2.4), the Project is not expected to adversely affect migratory birds, as defined under the *Migratory Birds Convention Act*. Potential effects of construction noise on migratory birds are also not anticipated due to the temporary nature of construction noise. Timing windows for valued components are currently based on existing studies, however these will be confirmed after field studies elucidate the presence or absence of specific species.

The bird species identified in the DPD are those most likely to be nesting on the bridge structure or adjacent areas based on existing information regarding habitat features. Confirmation of any migratory birds potentially affected by the Project would be subject to the completion of more detailed breeding and habitat surveys.

Based on a preliminary assessment, effects on migratory birds, nests and eggs, after the implementation of mitigation measures, are not anticipated due to the temporary nature of construction and the urbanized nature of the area. However, residual effects, including likelihood of effects, will be properly characterized after field surveys are conducted and as the project design progresses.

### **15.2.3 Aquatic Environment**

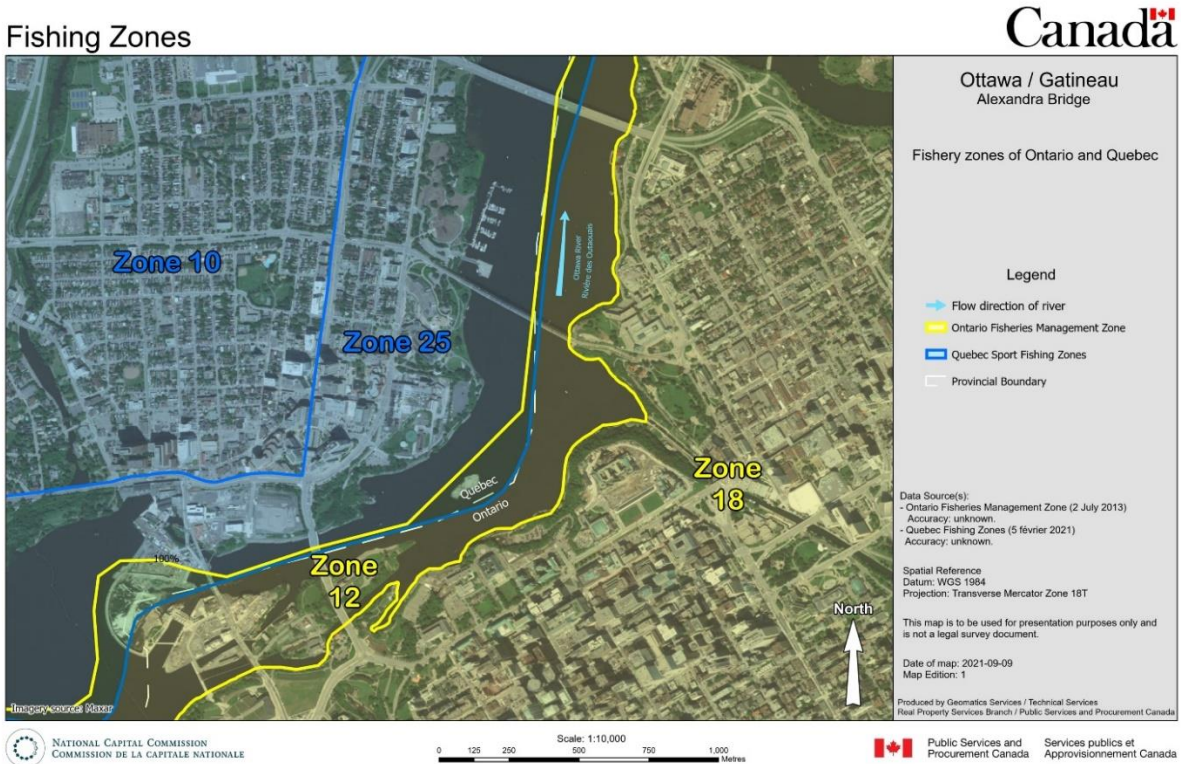
#### **15.2.3.1 Fish and Fish Habitat**

Fisheries resources in the Project area were identified through a desktop review of numerous background reports and data sources as outlined in Appendix F.

A diverse fish community is present in the Ottawa River, including a mix of cold and warm water fish species, with over 85 fish species recorded from its waters (MNRF & MFFP, 2018). Fish species include important sportfish, such as Walleye (*Sander vitreus*), Muskellunge (*Esox masquinongy*), Largemouth Bass (*Micropterus salmoides*), Smallmouth Bass (*Micropterus dolomieu*), Sauger (*Sander canadensis*) and Northern Pike (*Esox lucius*). Species at risk such as Lake Sturgeon (*Acipenser fulvescens*), American Eel (*Anguilla rostrata*) and River Redhorse (*Moxostoma carinatum*) are also known from the river. Electrofishing performed by Kilgour and Associates in 2013 behind the Parliament Buildings found that Eastern Silvery Minnow (*Hybognathus regius*), Silver Redhorse (*Moxostoma anisurum*) and Shorthead Redhorse (*Moxostoma macrolepidotum*) were the most common abundant fish species utilizing the immediate shoreline area.



For the purpose of fisheries management and harvest regulation, the entire river from Lake Timiskaming to the St. Lawrence River is identified as Fisheries Management Zone (FMZ) 12 under *Ontario Fishing Regulations*, and correspondingly Fishing Zone 25 under the *Quebec Fishing Regulations* (see Figure 15-4). Details regarding fisheries management approaches taken by both Ontario and Québec governments are provided in greater detail in the Fisheries Management Plan for the Ottawa River (MNRF & MFFP, 2018) and Background Information to the Fisheries Management Plan for the Ottawa River – Fisheries Management Zone 12 in Ontario, Fisheries Management Zone 25 in Québec (MNRF, 2016a).



**Figure 15-4: Fisheries Management Zones**

Both of these reports break FMZ 12 down into ten different reaches for the purpose of reach-specific analysis and development of management approaches for resident fish.

The delineation of reaches was originally developed in the report *Review of the historical and existing natural environment and resource uses on the Ottawa River* (Haxton & Chubbuck, 2002). Reach 10 is known as Lac Dollard-des-Ormeaux, which extends from the Chaudière Falls Generating Station (approximately 1.7 km upstream of Alexandra Bridge) to the Carillon Generating Station located approximately 18 km downstream of Hawkesbury. The Alexandra Bridge crosses the Ottawa River at the upstream end of Reach 10.

The Lac Dollard-des-Ormeaux reach supports the highest number of native fish species of all ten Zone 12 reaches, with 73 of the 89 species from the Ottawa River represented. The reach tends to support species that are more affiliated with warmwater habitats. Within the area of the reach around

Alexandra Bridge, Walleye and Smallmouth Bass are the most commonly caught sport fish however, Muskellunge have also been reportedly caught by anglers in the stretch behind Parliament Hill and up the Rideau Canal. Other warmwater species, such as Northern Pike, Sauger, Black Crappie (*Pomoxis nigromaculatus*) and Yellow Perch (*Perca flavescens*), are present in the area. In the vicinity of the downtown core, the Ottawa River supports at least 64 species of fish (Kilgour & Associates Limited, 2013).

Walleye are known to spawn below dams in tributaries and below the control structures at Chaudière Falls (Haxton & Chubbuck, 2002). Lake Sturgeon spawn immediately downstream of Chaudière Falls, at the tail end of Victoria Island (Haxton & Chubbuck, 2002 Kilgour & Associates Limited, 2013). American Eel were reportedly caught in 2012 by City of Ottawa staff during a dewatering activity at the base of the Fleet Street Pumping Station, which is located on a side channel downstream of Chaudière Falls (Kilgour & Associates Limited, 2013).

Given that the Alexandra Bridge crosses the interprovincial boundary and touches both the Ontario and Quebec sides of the Ottawa River, the restrictions on in-water work to protect fish during spawning and other critical life stages established by the two provinces, as well as those identified by Fisheries and Oceans Canada (DFO), must be respected. Timing restrictions are particularly important and are based on a waterbody's thermal regime and the presence of spring and/or fall spawning species. DFO provides timing window guidance (DFO, 2019b) for individual species based on broadly categorized Regions but defers to provincial agencies if those timing windows differ from provincial guidance provided by local agency offices. The Lac Dollard-des-Ormeaux reach is part of Ontario's FMZ 12, where timing restrictions for in-water works apply from January 1 to July 15, therefore work is only authorized between July 16 and December 31. The Lac Dollard-des-Ormeaux reach is also part of Quebec's fisheries region 7, where timing restrictions apply from April 1 to July 15 (work is therefore authorized between July 16 and March 31) (Annex L). However, if fall-spawning species are potentially present, the timing window is further restricted to July 16 – September 30.

Since two different timing windows exist for the same area, the most conservative work restriction period should be considered for the site under study. However, this may turn out to be too restrictive and unrealistic in practice for the Project. Both the Ontario and Quebec government note that standard timing restrictions are preliminary and that additional timing guidelines may apply depending on further review and fish species found during surveys. Therefore, appropriate timing windows as well as authorization requirements will be confirmed through discussions with both the Ontario MNRF, the Quebec MEFCWP and DFO based on the site-specific fisheries and fish habitat data to be collected for the areas potentially affected by the Project.

#### **15.2.3.2 Aquatic Species at Risk**

Aquatic species at risk (SAR) are defined as species that are protected under federal or provincial legislation, including species:

- Listed under Schedule 1 of SARA as endangered or threatened (GOC,2020)
- Listed under the ESA as endangered or threatened (MECP 2020b)
- Listed under the ARTVS as threatened or vulnerable (MELCC, 2019; MFFP,2019)

A wider group of species of management concern (SOMC) is also considered, which includes species:

- Listed under Schedule 1 of SARA as special concern (GOC, 2020)
- Assessed by COSEWIC as endangered or threatened, or special concern (GOC, 2020) but not yet listed under SARA
- Listed under the ESA as special concern (MECP, 2020b)
- Listed under the ARTVS as likely to be designated as threatened or vulnerable (MELCC, 2019; MFFP, 2019)
- Ranked as S1 (Critically Imperiled), S2 (Imperiled) and S3 (Vulnerable) by Ontario's Natural Heritage Information Centre (MNRF, 2019)

A review of the DFO Aquatic Species at Risk online mapping tool (DFO, 2019a) identified the following aquatic species at risk as occurring or potentially occurring within the area of the Alexandra Bridge (within a 1 km radius):

- Channel Darter (*Percina copelandi*) – Special Concern status (St. Lawrence populations) federally and in Ontario; Vulnerable status in Quebec.
- Northern Brook Lamprey (*Ichthyomyzon fossor*) – Special Concern status federally and in Ontario; Threatened status in Quebec.
- River Redhorse – Special Concern status federally and in Ontario; Vulnerable status in Quebec.
- Silver Lamprey (*Ichthyomyzon unicuspis*) – Special Concern status federally and in Ontario; under review in Quebec.
- Northern Sunfish (*Lepomis peltastes*) – Special Concern status federally and in Ontario; likely to be designated as threatened or vulnerable in Quebec.
- Hickorynut (*Obovaria olivaria*) – Endangered status federally and in Ontario; likely to be designated as threatened or vulnerable in Quebec (anticipated for listing in Quebec).

A request for information for aquatic SAR and SOMC records near the Project area was returned from the CDPNQ September 22, 2020 and included records for two species within 1 km of the Alexandra Bridge: Lake Sturgeon (possible spawning site between the Portage and Alexandra Bridges) and River Redhorse (historical occurrence) (CDPNQ, 2020). In addition to the possible spawning site near the Portage Bridge, Lake Sturgeon also reportedly spawn in the area of Victoria Island upstream of the bridge (Haxton & Chubbuck, 2002). This species is listed as endangered in Ontario and likely to be designated as threatened or vulnerable in Quebec. Although it has no status under the federal SARA, it has been assessed as threatened by COSEWIC and is under consideration for addition to *Schedule 1 of the Act*.

The Cutlip Minnow (*Exoglossum maxillingua*), while not identified specifically in the area of the Alexandra Bridge, is known from the Lac Dollard-des-Ormeaux reach and is listed as special concern federally and as threatened in Ontario (MNRF, 2016a); it currently has no status in Quebec.

American Eel (*Anguilla rostrata*) have been noted both upstream and downstream of the Alexandra Bridge (NCC, 2021c). They are considered very rare and are a provincially endangered species in Ontario and likely to be designated as threatened or vulnerable in Quebec. Although it currently has no federal status, this species has been assessed as threatened by COSEWIC and is under consideration for addition to *Schedule 1* of the SARA. The species' life cycle is impressive, as it hatches from spawning grounds in the Sargasso Sea of the Atlantic Ocean, with young eels migrating along ocean currents to many

freshwater streams and rivers along the North American east coast. They live in these rivers for a number of years before returning to the ocean and ultimately to the spawning grounds of the Sargasso Sea. The species was once extremely abundant throughout the Ottawa River and its tributaries. The rapid decline of the species can be attributed to a number of factors including over-fishing, pollution and habitat degradation however, there is a prevailing belief that hydroelectric dams have had the most substantial impact by creating barriers to upstream and downstream migration of the species (Ottawa Riverkeeper, 2020).

The Ottawa River is also home to a considerable variety of freshwater mussels. At least 16 species of native mussels are found in the Ottawa River drainage, which represents over 25% of Canada's 55 species of mussel fauna. The Hickorynut mussel (*Obovaria olivaria*) is identified by DFO SARA mapping in the area of the bridge and is listed as Endangered federally and in Ontario and is considered likely to be designated as threatened or vulnerable in Quebec (it is currently in the process of being designated as threatened).

If any interactions with aquatic species at risk are identified during the detailed design, mitigation could include scheduling of work to avoid fish migration and spawning windows, restrictions on construction methods to reduce noise/vibration levels and/or compensation if and as required by DFO.

### **15.2.3.3 Potential Impacts**

The existing Alexandra Bridge structure is supported beneath by six piers constructed of concrete and masonry. While the specific design of the new bridge has not yet been determined, a structure that will result in a reduction of the number of supporting piers required will decrease the footprint of impact on physical fish habitat in the river. Such an approach would allow for rehabilitation and restoration of fish habitat in areas where piers are removed, which could potentially be viewed as a positive impact.

A more detailed assessment of the potential impacts of the Project on fish and fish habitats, including SAR, species native to the Ottawa River and the Rideau Canal, and species of importance to Indigenous communities, will be completed based on the findings of future fish surveys and following the development of the initial designs stages and the construction methods.

#### **15.2.3.3.1 Deconstruction and Construction**

Potential changes that may affect fish, fish habitat, and aquatic species would occur primarily during the construction stage of the Project. Construction activities and work carried out in the water and on land adjacent to the water have the potential to impact fish and fish habitat. The Project area provides general habitat for a number of fish species and likely acts as a seasonal migration corridor for species that are moving into potential spawning grounds, such as Walleye and Lake Sturgeon that spawn below Chaudière Falls and Victoria Island, respectively.

Fish habitat may be temporarily affected during the deconstruction of old piers and construction of new piers. During deconstruction, equipment operation and deconstruction activities have the potential to directly interfere with existing habitat in the vicinity of the piers, and debris generated during deconstruction may enter the water column and rest on the riverbed. During construction of new piers, there will be a requirement for excavation or other disturbance of the riverbed and existing habitat features to facilitate the construction of footings to support the pier.

As noted previously, deconstruction and construction activities have the potential to impact water quality through contaminant spills as well as the introduction of debris, dust and sediment. The construction stage of the Project has the potential to result in bed and bank disturbance/erosion which can result in turbidity spikes, TSS loading and overall sedimentation, all of which can be detrimental to physical habitat structure (e.g., spawning beds) as well as to the physiological processes of fish. Increased sediment loading can cause gill abrasion and may force fish to avoid the area, which can be interpreted as a disruption to fish habitat use.

The deconstruction of the existing piers and in particular, the construction of new piers, will require review by DFO and possibly by the provincial authorities (MNRF/MEFCCWP). DFO authorization can only be provided after the IAAC determination is issued, and provincial authorizations will require a detailed design. As a preferred design is determined and detailed design is in progress, DFO and the provincial authorities will be engaged through the submission of a Request for Review and follow-up consultation.

#### 15.2.3.3.2 Operation

During operation, changes in fish habitat as a result of the Project are not anticipated from existing conditions. During operation, water quality may be affected by the introduction of suspended solids (e.g., during works in-water on the riverbank), petroleum hydrocarbons (e.g., accidental spills) and de-icing salts into the receiving environment.

Table 15-8 identifies, for each potential impact, the physical activities that might interact with the Aquatic Environment and result in the identified environmental impact.

**Table 15-8: Project interactions with aquatic environment**

Project Stage	Physical Activities	Potential Impacts
		Change in fish habitat
<b>Deconstruction</b>	Deconstruction of infrastructures	✓
<b>Construction</b>	Site mobilization and construction of temporary facilities	✓
	Land clearing and soil stripping	✓
	Excavation, earthwork	✓
	Construction of infrastructure	-
	Work in aquatic environments	✓
	Deconstruction of temporary structures	✓
	Demobilization of construction site	-
<b>Operation</b>	Use of infrastructure	-
	Maintenance and repair of infrastructure	-
<b>NOTES:</b>		
✓ = Potential interaction		
- = No interaction		

A more detailed assessment of the potential impacts of the Project on fish and fish habitats, including SAR, species native to the Ottawa River and the Rideau Canal, and species of importance to Indigenous communities, will be completed based on the findings of future fish surveys and following the development of the initial designs stages and the construction methods.

#### 15.2.3.4 Mitigation and Protective Measures

Field surveys will be conducted prior to the initial design stages to identify the presence of fish (including SAR/SOMC) and fish habitat (including aquatic, semi-aquatic and riparian habitats) within the Project area. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, MEFCWP, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.

After field surveys are conducted and a list of aquatic species, SAR/SOMC and potential fish habitat is identified, species-specific mitigation measures and permit requirements will be identified, and a management approach will be developed. Detailed mitigation measures, the management approach and follow-up programs will form part of the EEP.

Mitigation measures for in-water works can include passive approaches, such as respecting timing windows and other avoidance mechanisms, as well as physical measures to reduce the area of potential effect to the immediate work area.

As described in the mitigation and protective measures for surface water (Section 15.1.4.2), the EPP will include an Erosion and Sediment Control (ESC) Plan (Section 22.4) that will be developed, implemented and enforced during construction to reduce potential impacts on water quality. The ESC Plan will include a multi-barrier approach defining the location and design of control mechanisms such as silt fencing, rock check dams, straw bale filters, drain covers, filter fabric under catch basins frame and gates and mud mats, as required. In addition, the EPP will include a Fish and Fish Habitat Protection and Offsetting Plan.

Appropriate and reasonable timing windows for in-water works will be determined with the appropriate federal and provincial authorities during the detailed design stage. Provincially established timing windows are available for the Lac Dollard-des-Ormeaux reach of the Ottawa River from both Ontario and Quebec natural resource management agencies. The appropriate timing window for the Project will be discussed with approval agencies and will be scientifically based on the species present in the area, and their likelihood of using habitat in the area for specific sensitive life periods (e.g., spawning and incubation of eggs, spawning migration, etc.).

During construction, the use of cofferdams to isolate in-river work areas will reduce the impacts noted above. However, there will be temporary impacts associated with the coffer dams, including loss of water cover within the dammed area, drying of the riverbed in the dammed area and some bed disturbance associated with the installation and removal of the dams. Mitigation measures include fish and mussel rescues from the dammed area prior to complete dewatering, and the use of low impact dam materials such as Aqua-Barrier or Aqua Dam coffer dams.

A turbidity curtain will be installed around the perimeter of the in-water work zone to further promote isolation of the construction zone, as well as reduce water quality impacts and the downstream migration of silt and sediment from dewatering activities (as described in Section 15.1.4). Turbidity will be monitored daily during in-water construction activities to confirm there are no increases as a result of Project construction.

Mitigation measures for the prevention of excessive sedimentation and debris encroachment are similar to those employed to minimize water quality impacts. Erosion and sedimentation control (ESC) measures will be implemented and maintained throughout all stages of construction to protect the receiving waters and surrounding environment. ESC measures will be installed around the extent of the construction work zone(s) as well as around the perimeter of stockpiles required for construction. All activities, including maintenance procedures, will be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the water. A spill prevention and management plan (Section 22.2) will also be developed for the Project. For the deconstruction of old piers and the construction of new piers, the work area in the vicinity of the piers will be isolated.

By incorporating best management practices such as those discussed above and in previous sections pertaining to water quality, the overall impact of the bridge replacement on aquatic habitat and resident fish species will be reduced.

The Project will require review by DFO and is expected to require a *Fisheries Act* authorization. A typical condition of a *Fisheries Act* authorization is the requirement for post-construction monitoring over a period of up to three years, or for another period of duration to be discussed with DFO. Typical monitoring components include examining the construction zone and downstream environments for stability, habitat restoration success and function as per the intent of the design. Monitoring may also be required during deconstruction and construction, such as turbidity monitoring as mentioned previously, and continuous supervision by qualified inspectors during in-water construction activities to report on the installation and performance of recommended mitigation measures.

Based on this preliminary assessment, residual impacts to fish and fish habitat, potentially including aquatic SAR, as a result of construction activities are likely to occur following the implementation of mitigation measures. However, they are predicted to be low in magnitude, and localized to the construction zone. At a maximum, they may extend to the LAA (200 m buffer around the PDA) and will be short-term. Impacts are expected to be reversible following the implementation of habitat restoration and enhancement measures.

#### **15.2.3.5 Enhancement measures**

While the specific design of the new bridge has not yet been determined, a structure that will result in a reduction of the number of supporting piers required will decrease the footprint of impact on physical fish habitat in the river. Such an approach would allow for rehabilitation and restoration of fish habitat in areas where piers are removed. Through the implementation of habitat creation, restoration and other offsetting measures, impacts from this Project on fish and fish habitat to achieve net environmental benefits may be positive over the long-term. In addition, there may be an opportunity for works with environmental benefits to be completed as part of this Project to offset some of the cumulative impacts of urban developments in this region.

PSPC and NCC will work with the study team as well as agency experts from DFO/MNRF/MEFCCWP and will consider enhancement measures or compensation measures (if required) during the design of shoreline restoration works that could improve general fish habitat and spawning habitat during shoreline restoration works for fish in the Ottawa River, including the American Eel. The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCCWP, etc.), and will engage Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.

#### **15.2.3.6 Potential Changes to Fish and Fish habitat, as defined in subsection 2(1) of the Fisheries Act**

Project implementation could result in changes to fish and fish habitat, as defined in subsection 2(1) of the *Fisheries Act*. The Project is likely to result in the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat and will likely require Authorization under the *Fisheries Act*. The destruction of fish habitat that is likely to occur as a result of new pier construction might be partially offset by the restoration of habitat in the area of removal of old piers. However, the details of habitat offsetting will require further analysis and calculation of habitat impacts at the detailed design stage.

DFO was contacted in November 2020 by the IPT to engage in their role as both a regulator under the *Fisheries Act*, and an Expert Department on potential enhancement measures. In response, DFO clarified



the submission requirements for the Request for Review. The following information should form part of the Request for Review application:

- A description of aquatic habitat at the site (substrate type, aquatic vegetation, riparian vegetation) and a description of the existing structure
- The calculated footprint (m<sup>2</sup>) of both temporary and permanent in-water works
- Consideration of any aquatic species at risk that may be present in the vicinity of the Project
- A determination of whether any works are likely to cause the death of fish or the harmful alteration, disruption or destruction of fish habitat (HADD)
- Identification of any measures used to avoid or mitigate impacts to fish and fish habitat, and any residual impacts that may occur after the incorporation of these measures

A meeting will be held to discuss the Project and potential for enhancement measures during the detailed design stage.

Any required permits and approvals will be obtained from applicable provincial and federal agencies, and any impacts to fish and fish habitat will be compensated if required as per the current *Fisheries Act*.

#### ***15.2.3.7 Potential Changes to Aquatic Species, as defined in subsection 2(1) of the Species at Risk Act (marine plants)***

There are no anticipated interactions with marine plants since the Project is in a freshwater environment. As mentioned above, DFO has been engaged and will participate in the review of Project details and measures used to avoid or mitigate impacts related to aquatic species at risk.

#### ***15.2.3.8 Environmental Changes That May Occur on Federal Lands, In Other Provinces or Outside of Canada***

The Alexandra Bridge crosses the Ottawa River between the cities of Ottawa, in the province of Ontario, and Gatineau, in the province of Québec. No direct environmental changes to other provinces or on lands outside of Canada are anticipated.

Depending on the final bridge design, the Project footprint may extend beyond the existing Alexandra Bridge footprint. There is potential for temporary environmental changes (for example, vegetation loss) to federal lands during construction due to equipment and material storage and movement. These changes will be minimized wherever possible, such as staging on paved areas and protecting trees, and the site will be reinstated at the end of the construction stage.

The potential for minor temporary adverse impacts (such as erosion, etc.) during construction will be addressed through appropriate mitigation measures such as the use of erosion and sediment control measures and cutting of vegetation outside of the breeding bird season. The loss of vegetation will be adequately compensated (e.g., trees will be replaced at a minimum ratio of 2:1), as will impacted shorelines and/or fish habitat (e.g., through habitat restoration). In addition to the potential impacts on the environment and related mitigation measures outlined throughout Section 15, additional mitigation measures will be developed during detailed design to address potential environmental impacts on federal lands.

## 15.3 Future Studies

To address the data gaps identified in this section, there are a number of studies that are being scheduled within the next two to four years to inform the Project plan development and future regulatory requirements. Further details regarding the design and methods of construction will be developed in the design stages of the Project. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed.

Table 15-9 provides a summary of these planned studies. It should be noted that the timing may change depending on expert recommendations and Project progress.

**Table 15-9: Planned studies**

Alexandra Bridge Replacement Project (For reference - Section Titles of the Tailored Impact Statement Guidelines are in bold)	
Studies and plans	Estimated Timeline
<b>Baseline Condition: Biophysical Environment</b>	
<b>Atmospheric, acoustic, and visual environment</b> <i>Air quality</i> (Deconstruction and Construction) <i>Greenhouse Gas (GHG) Analysis</i> (Deconstruction and Construction) <i>Acoustic Impact</i> (Deconstruction and Construction period)	Information will be updated once details of the Project are known.  GHG Analysis planned for 2025
<b>Meteorological Environment</b> (Temperature, Precipitation, Wind, Visibility)	Update information if required based on climate risk assessment, desktop review or monitoring station data and analysis 2025
<b>Climate Change</b> - Climate Risk and Vulnerability Assessment	2023/spring 2024 Terms of reference currently under development
<b>Geology, geochemistry and geological hazards</b>	Phase II ESA analysis completed by WSP, 2021a Geotech Analysis completed by WSP, 2021c Additional work completed as part of the design of the bridge, if needed.
<b>Topography, soil and sediment</b> <i>Topographic Survey of the PDA, including bathymetric survey of the Ottawa River</i>	Geotech Analysis completed by WSP, 2021c Phase II ESA analysis completed by WSP, 2021a Additional work completed as part of the design of the bridge, if needed.
<b>Riparian and wetland environments</b>	Field work will be part of surface water studies

**Alexandra Bridge Replacement Project**  
**(For reference - Section Titles of the Tailored Impact Statement Guidelines are in bold)**

Studies and plans	Estimated Timeline
<p><b>Groundwater and surface water</b></p> <p><i>Hydrogeological assessment</i></p>	<p>Geotech Analysis completed by WSP, 2021c            Phase II ESA analysis completed by WSP, 2021a</p> <p>Hydrogeological assessment will be completed as part of the design of the bridge.</p> <p>Surface water quality sampling and assessment</p> <p>Summer/fall 2025</p>
<p><b>Hydrology</b></p> <p><i>Hydrology assessment</i></p>	<p>Hydrology assessment will be completed as part of the design of the bridge.            Anticipated 2024/2025</p>
<p><i>Ecological characterization of terrestrial and aquatic Project area (both shores, including staging areas and other potentially impacted lands), including ecological land classification (ELC), vegetation surveys, tree inventories, wetlands, terrestrial fauna, and fish and fish habitat, including species at risk.</i></p> <p>Breakdown of specific studies are provided below.</p>	
<p><b>Vegetation</b></p> <p><i>Inventory for potential plant SAR/SOMC (or their suitable habitat) and invasives.</i></p> <p><i>Detailed vegetation surveys (including tree inventories, identification of ecological communities) within the proposed development footprint and other impacted sites.</i></p> <p><i>Butternut health assessments (as required)</i></p>	<p>Spring/Summer/Fall 2023            Additional work in 2024 as required</p> <p>Once the adjacent impacted lands have been confirmed</p> <p>Following the detailed vegetation surveys (as required). Must be completed between May 15 and August 31 to be valid.</p>
<p><b>Birds, migratory birds and their habitat</b></p> <p><i>Inventory of birds, including surveys for SAR/SOMC, migratory birds and their habitat use, breeding birds, winter bird surveys, and studies to determine seasonal and annual variation in bird populations.</i></p> <p><i>Bird nest searches prior to vegetation removal</i></p> <p><i>Scans for migrant birds using the area as a stop over</i></p>	<p>Spring/Summer/Fall 2023 and Winter 2024</p> <p>Within 48 hours of vegetation clearing if occurring during the breeding bird season</p> <p>Spring and Fall 2023 (if required)</p>

**Alexandra Bridge Replacement Project**  
**(For reference - Section Titles of the Tailored Impact Statement Guidelines are in bold)**

Studies and plans	Estimated Timeline
<p><b>Terrestrial wildlife and their habitat</b> (mammals and herpetofauna)  <i>Inventories of potential animal SAR/SOMC (or their habitat)</i></p> <p><i>Studies of the seasonal and annual variations in SAR occurrence and/or habitat use.</i></p> <p><i>SAR bat colony/maternity roost surveys, including a tree bat habitat maternity roost assessment and bat exit survey at the bridge.</i></p> <p>Studies of bat migration in the Project area and overwintering use by SAR wildlife</p> <p><i>Turtle emergence and basking surveys</i></p> <p><i>Turtle nesting site characterization and surveys</i></p> <p><i>Snake emergence surveys</i></p> <p><i>Amphibian surveys</i></p> <p><i>General mammal surveys (not including bats)</i></p>	<p>Spring/Summer/Fall 2023 + Winter 2024</p> <p>Spring/Summer/Fall 2023 + Winter 2024</p> <p>June/July 2023</p> <p>Spring/Fall 2023 + Winter 2024</p> <p>May/June 2023</p> <p>June 2023</p> <p>May/June 2023</p> <p>Spring/Summer 2023</p> <p>Spring/Summer/Fall 2023 and winter 2024 (during other surveys and inventories)</p>
<p><b>Fish and fish habitat</b>  <i>Field surveys to ID the presence of fish (including SAR/SOMC) and fish habitat (including aquatic, semi-aquatic and riparia habitats) within the Project area. Includes the description of the aquatic habitat (substrate type, aquatic vegetation, riparian vegetation), DFO Species at Risk mapping, electrofishing survey (if required) and SAR mussel inventory (to support the DFO Request for Review).</i></p> <p><i>Potential additional areas of study to assess alternative temporary wharf locations and other impacted lands if required.</i></p>	<p>Spring/Summer/Fall 2023</p>
<p><b>Cumulative Effects</b>  <i>Cumulative effects assessment for Valued Components (VCs)</i></p>	<p>2024-2025</p>

**Baseline Condition: Human Health**



**Alexandra Bridge Replacement Project**  
**(For reference - Section Titles of the Tailored Impact Statement Guidelines are in bold)**

<b>Studies and plans</b>	<b>Estimated Timeline</b>
<i>Assessment of benefits/impacts to human health of new structure</i>	Completed by PwC in 2021
<i>Human Health Risk Assessment (HHRA)</i>	An HHRA will be completed, if required.
<b>Baseline Condition: Social</b>	
<b>Cultural Heritage</b> <i>Heritage Impact Analysis (HIA)</i>	Winter 2022 to Winter 2024 Terms of Reference currently under development
<i>Bridge Heritage Recording and other mitigation work</i>	On-going
<i>Land-based Archeological inventories (for defined areas if required)</i>	Summer/Fall 2023
<i>Underwater archaeological survey of the riverbed near the shoreline (for defined areas as required)</i>	Summer/Fall 2023
<i>Adjacent Impacted Lands Study</i>	On-going
<i>Transportation Impact Assessment</i>	2024-2025
<b>Baseline Condition: Economic</b>	
<i>Cost/Benefits analysis of new structure</i>	Completed by PwC in 2021
<i>Study of the current socioeconomic conditions within the Project area</i>	Information will be updated, if required, once details of the Project are known.
<b>Baseline Conditions: Indigenous Peoples</b>	
<i>Physical and Cultural Heritage</i>	All information will be gathered through ongoing engagement and will vary for each Indigenous community.
<i>Current Use of Lands and Resources for Traditional Uses</i> - <i>Survey of traditional plants</i> - <i>Health, social and economic conditions</i>	
<i>Conditions related to the Rights of Indigenous Peoples</i>	
<i>Predicted Changes to the Physical Environment</i>	
<i>Predicted Changes to Valued Components</i>	Discussed based on results of studies completed

Other studies could be added as the Project progresses.

Continued engagement with Indigenous communities will help to contribute Indigenous Knowledge, identify concerns and determine some of the studies that may be needed.

The nature of their participation will be determined by the Indigenous communities themselves, including:

- reviewing draft Terms of References for studies
- leading studies with financial support from the IPT and providing the results to the IPT
- participating in parallel with the work of external experts hired by the IPT
- reviewing the results of studies undertaken under the direction of the IPT and providing comments and guidance.

The following Indigenous communities have expressed initial interest in participating in or leading various studies:

- **Algonquins of Ontario (AOO)**
  - The IPT and the AOO have agreed on a multi-year work plan and budget that will support the completion of several studies of interest to the community.
  - The community has requested that the Kichi-Sibi Guardians participate in the development and implementation of fish surveys, the review of reports and various environmental monitoring efforts.
  - The community will conduct its own AOO Health and Socio-Economic Study and Algonquin Knowledge and Land Use Study (AKLUS).
- **Algonquins of Pikwakanagan First Nation (AOPFN)**
  - The community will conduct its own studies, including a cumulative effects assessment, and will determine at a later date how it will participate in studies led by the IPT.
  - AOPFN will share valuable Indigenous Knowledge to help support the development of the Climate Risk and Vulnerability Assessment.
  - The community has expressed a desire that AOPFN Knowledge Keepers participate in several biophysical studies, including:
    - The design of the bird field surveys
    - The creation of the list of species
    - The identification of the scale and scope of aquatic and semi-aquatic plant community surveys and contribution of Indigenous Knowledge to various aquatic surveys.
- **Kebaowek First Nation (KFN)**
  - The First Nation has indicated that it will conduct its own studies, including a cumulative effects or regional assessment of the Ottawa River watershed.
- **Kitigan Zibi Anishinabeg First Nation (KZA)**
  - The community is interested in all archaeological digs that may take place as a result of the Project.
- **La Nation Huronne-Wendat**
  - The Nation has expressed an interest in participating in and/or leading various environmental and cultural impact studies.
  - The Nation is particularly interested in reviewing the archaeological/heritage studies that have already been completed, including supplementing existing data and studies with their own as needed, as well as participating in the development of future studies.
- **Timiskaming First Nation**

- The community has requested involvement in reviewing the terms of reference and participating in project studies. Species studies are of particular importance to the community.
- The community also requested that communities be invited to help return aquatic species to the river during de-watering activities, as well as the opportunity to harvest any deceased organisms for possible consumption or use in traditional crafts.
- **Wahgoshig First Nation**
  - The community would like to create a workplan and budget to support their participation in the Project.



### 15.3.1 Climate Change Assessment

A climate risk and vulnerability assessment (CRiVA) study of the Alexandra Bridge will be performed to identify and assess potential site vulnerabilities to climate change and extreme weather and to make recommendations on adaptation measures that can be incorporated into the infrastructure engineering design to address the risks and vulnerabilities.

This CRiVA study addresses commitments in the Federal Sustainable Development Strategy for Canada, 2019-2022 (ECCC, 2019) and the Greening Government Strategy: A Government of Canada Directive (TBS, 2020). The Federal Sustainable Development Strategy outlines a commitment for the Government of Canada to: *“...take action to understand a wide range of climate change impacts that could potentially affect federal assets, services and operations across the country.”*

In addition, *“All major real property Projects will integrate climate change adaptation into the design, construction and operation aspects.”*

The Greening Government Strategy: A Government of Canada Directive states that: *“Departments will ensure that all new buildings and major building retrofits prioritize low-carbon and climate resilience. Investment decisions will be based on total cost of ownership: all new federal buildings, infrastructure and major building retrofits, including significant energy performance contracts, require a climate risk assessment that incorporates both current and future climate conditions in the analysis.”*

To this end, a study of the crown-owned properties (Directory of Real Property sites 23280, 23287 and 04260) will be conducted to clarify the main climate hazards (nature and severity) to the new bridge, the vulnerability of the site, the level of risk, and strategies for mitigating the impacts of climate change.

The CRiVA study will be conducted in accordance with the Public Infrastructure Engineering Vulnerability Committee (PIEVC) protocol or Envision, which are compliant tools with ISO 31000 and ISO 14091 Risk Management and are recommended by the Infrastructure Canada’s Climate Lens Program. This is consistent with the guidance provided in the Strategic Assessment of Climate Change (SACC) *section 5.1.5 on Climate change resilience*. The study will involve a review of available documentation for the Project site from the NCC and PSPC sources, including previous studies on the climate projections and climate hazards for the region. A gap analysis will be done to obtain any relevant climate parameters that are not available from the previous studies or detailed hydraulic modeling of the Ottawa River in the area of study, if required. In addition, infrastructure elements that may present vulnerabilities to climate hazards will be analyzed to estimate the likelihood of an interaction, effects, and risks associated with the identified climate events. Finally, recommendations for the design will be presented based on the findings of the study.

The IPT looks forward working with interested Indigenous communities to develop an approach to collect Indigenous Knowledge to be integrated in the climate vulnerability and risk assessment. Then, together, determine how the knowledge will contribute to mitigating and planning for the impacts of climate change.



## 16 SOCIO-ECONOMIC SETTING

To identify potential social, economic, and human health considerations relevant to the Project, a desktop review of available information in the form of reports, maps and publicly available databases has been conducted (see Appendix F). Applicable information is provided throughout this section. It is to be noted that the IPT continues to work with the Indigenous communities to identify socio-economic benefits as a result of the Project along with impacts and appropriate mitigation measures.

Potential adverse impacts of the Project were evaluated through consideration of the interactions between the Project and the social, economic, and human health environment. Mitigation measures that could avoid or reduce potential adverse social impacts are also identified. Residual impacts along with cumulative effects (where applicable) will be further evaluated and confirmed at the design stage.

### 16.1 Social Context

This Section provides baseline information on the existing social conditions and activities for communities potentially affected by the Project. The community profile information provides a basis for a qualitative analysis of the potential socio-economic impacts associated with how diverse groups of people may experience all stages of the Project in different ways. Beyond a better understanding of potential impacts, a socio-economic analysis can help in identifying ways to manage and/or mitigate said impacts.

The Alexandra Bridge is the thread tying together the heart of Canada's National Capital Region (NCR) from Major's Hill Park to Jacques-Cartier Park, to the Voyageurs Pathway and the Ottawa River Pathway. The bridge serves a function, but its splendor lies in the convergence of its site and place in the Nation's Capital. The NCR covers an area of 4,715 km<sup>2</sup> in both Québec and Ontario along the Ottawa River. The region is located within the traditional territory of the Algonquin people. This area is composed of several jurisdictions, including the City of Ottawa, Ville de Gatineau, and the Municipalité régionale de comté (MRC) des Collines-de-l'Outaouais (and its member municipalities of Chelsea, La Pêche and Pontiac). Transportation to the NCR is served by multiple airports, railways, and interprovincial highways. There are two rapid-transit public transport networks in the NCR: the Rapibus system (SRB) operated by the Société de transport de l'Outaouais (STO) in Gatineau and the O-Train Light Rail Transit system (LRT) and city bus system operated by OC Transpo in Ottawa.

The Alexandra Bridge, along with the Portage Bridge, are integral parts of Confederation Boulevard's Ceremonial Route. Confederation Boulevard, owned and managed by the NCC, is a key feature of the Capital Core that is not only closely identified with the National Symbols, but also widely recognized as a destination in its own right. Alexandra Bridge is a national asset, integral to Confederation Boulevard and its replacement must complement its role as part of the Confederation Boulevard Ceremonial route. The primary components of the ceremonial route include the Grand Esplanade (pedestrian promenade), Links, Nodes and Gateways. Full description of these components and a map are provided in the Planning and Design Principles (refer to Appendix G). The NCC's Confederation Boulevard Guidelines, Management and Stewardship of Our Capital Legacy report (NCC, 2011) defines major components that reinforce the image of a continuous circuit around the Capital Realm.

Alexandra Bridge is a unique place that offers an important vantage point affording significant views, drawing visitors and residents to experience the panoramic views of the Parliament Buildings, as well as national cultural symbols such as the Rideau Canal locks, Kiwexi Point (formerly named Nepean Point), Major's Hill Park, Lady Grey Drive, Jacques-Cartier Park and the Ottawa River. As per the NCC's Canada's Capital Views Protection Plan (2007), preserving the visual integrity of these symbols for future generations is of the utmost importance in planning for the NCR. This includes not only the symbols from key viewpoints located on and around the bridge itself, but also in protecting the views of foreground areas (including central and lateral foreground areas), when considered from points along Confederation Boulevard and from the public parklands and pathways along the Ottawa River shoreline.

Moreover, the existing bridge is vital to creating and maintaining social links between Ottawa and Gatineau and provides a major symbolic connection between the two provinces and their unique histories, languages, cultures and other social characteristics. The Alexandra Bridge is a key element of the multi-use pathway system, part of the Trans Canada Trail system, that connects the NCC's Capital Pathways in downtown Ottawa to Gatineau's Voyageurs Pathway. Through collaborative efforts with provincial and territorial trail partners, as well as corporate partners and patrons, the Trans Canada Trail is made available for use and maintained through weather incidents and road closures as required. The interactive map available online is a tool which is used to provide warnings or road information to users of the trail system (TCT, 2022). This pathway passes under the bridge connecting Jacques-Cartier Park South with the Canadian Museum of History lands. It also connects to the De l'île Pathway which links Jacques-Cartier Park through Laurier Street to the Ruisseau de la Brasserie Pathway, running through the heart of old Hull. These are important links to support key planning direction expressed by both Ottawa and Gatineau.

One of Ottawa's key mobility policy directions is to actively work with the Federal Government, the provinces and the City of Gatineau to improve inter-city rail, light rail, and a stronger regional transit network. This includes improving pedestrian and cycling networks and connections to transit, creating a multimodal transportation network that supports the image and stature of Ottawa-Gatineau as an important metropolitan region, where it is possible to live a car-light and car-free lifestyle.

Part of Gatineau's overall vision seeks to prioritize an urban fabric based on sustainability and mobility, including intensification of the urban core and transit-oriented development to connect residential and employment lands. The plan also emphasizes the protection of cultural and natural heritage resources, such as the Quartier du Musée and Jacques-Cartier Park – both of which are located on Hull Island and flank the Québec-side portion of the Alexandra Bridge.

In Ottawa, the Project is located adjacent to the historic Byward Market district which is a major local tourism hub with retail, agricultural and entertainment attractions (refer to Figure 14-6). The Alexandra Bridge is also located near to the entrance to the Rideau Canal, a National Historic Site of Canada, a Canadian Heritage River and a UNESCO World Heritage Site. To the East, the neighbourhood of Lowertown is a vibrant urban residential area and a Heritage Conservation District. To the West, is the core of the downtown business district. The Parliamentary Precinct, the seat of Canadian federal politics directly overlooks the Alexandra Bridge.

In Gatineau, the Project is located within the Hull sector which is the central business district as well as the oldest neighborhood of the city. Within the urban hub of the city, there is a large concentration of

Federal Government offices (e. g. Place du Portage, Terrace de la Chaudière and others). The bridge approach is directly adjacent to both the Canadian Museum of History and Jacques-Cartier Park.

Population data obtained from the 2016 census (Statistics Canada, 2017) covers the Census Metropolitan Area (CMA) which is the area nearest to the bridge but represents a smaller area than the one encompassed by the NCR. A broader segment of the population will consequently be potentially impacted by the Project and will be considered during the planning, design and construction stages.

The population of the Ottawa-Gatineau Census Metropolitan Area (CMA) is estimated to be over 1.3 million. Between the 2011 and 2016 census, the population increased by 5.5%, which is above the national average. In the CMA, approximately 992,000 people resided in Ontario and 332,000 people resided in Québec according to the 2016 census. In Ontario, 482,320 (48.6%) individuals were recorded as male and 509,405 (51.4%) were recorded as female, while in Québec, these were 162,730 (49.0%) and 169,325 (51.0%) respectively. Between 1996 and 2016, the population of the CMA increased by 32% and it was Projected to add roughly 200,000 residents by 2031.

The NCR is home to a culturally and ethnically diverse population. The languages spoken in the area are predominantly English (51.4%) and French (32.5%). The 2016 census documented notable geographic differences, where 79.9 % of Ontario residents (782,875 individuals) reported English as the first official language spoken and 80.3% of Québec residents (263,970 individuals) reported French as the first official language spoken. In 2016, approximately 18% of census respondents listed their mother-tongue as a non-official language of the Ottawa-Gatineau CMA, the most common being Arabic, Spanish and Mandarin.

In Ottawa, the 2016 census showed that 219,705 (22.6%) were foreign-born residents and visible minorities accounted for 25%. In Gatineau, nearly 36,000 (11%) foreign-born residents and visible minorities accounted for 13.5% of the Gatineau population. Women also make up a slightly higher proportion of the foreign-born and visible minorities than the city-wide average (53% vs 51% for the CMA).

In the 2016 census, residents of Indigenous ancestry numbered over 22,000 living in Gatineau and over 40,000 in Ottawa.

These cultural differences between Gatineau and Ottawa are important factors to consider during the planning, design and construction stages to help ensure that the needs of diverse groups and communities are identified and that as many of these needs are met through the development of innovative solutions to complex social challenges associated with the Project.

The IPT is sensitive to a noteworthy historical event which will be considered when engaging in stakeholder consultations with members of the LGBTQ2+ community. On August 21, 1989, a notable murder was committed on the bridge due to the murderer's assumption that the victim was homosexual. This tragedy and its causes led to widespread shock in the city, mobilization of the LGBTQ2+ community (which had long been the target of violence in the area) and the introduction of unprecedented police reforms. In its wake, the Ottawa Police Service would pioneer diversity training and become the first in the country to establish a hate crimes unit (Duffy & Smith,2014). Stakeholders

belonging to and representing the LGBTQ2+ community have been invited to engage on this Project (see Public Engagement Section 3.2 and stakeholder list provided in [Appendix A](#) and [C](#)).

As the planning and design of the new structure progresses, the IPT will be forward thinking in anticipating how the Project could potentially impact this particular segment of the population and how these impacts can be mitigated.

According to the 2016 census, 75% of the working age population from 25 to 64 in Ottawa and 67% in Gatineau have a post-secondary education of some kind. Working age population who have a postsecondary certificate, diploma or degree, often employed in the construction industries, represent 63.2% of the population in Ontario (62.3% men and 64.0% women) while in Québec, it represents 58.0% of the population (56.7% for men and 59.3% for women). Workers with university certificates, diplomas or degrees at bachelor level or above represent 36.5% of the Ontario population (36.2% men and 36.8% women) and 23.8% of the Québec population (22.1% men and 25.2% women).

The average personal income, according to the 2016 census is \$52,798 in Ontario (\$60,064 for male and \$45,437 for female respondents) while it was \$44,632 in Québec (\$48,162 for male and \$41,031 for female respondents). Income alone is not a suitably complex measure to determine the social vulnerability of communities. Using the 2016 census, a new Geographic Information System (GIS) dataset that maps the socioeconomic status of the communities on and adjacent to NCC lands was completed to fulfill a commitment under the NCC's Sustainable Development Strategy (SDS) principle of social equity.

The following seven census datasets were identified as the best indicators of social and economic vulnerability:

- Residents living in low income according to the low-income measure after taxes (LIM-AT)
- Labour force participation rate
- Lone-parent families
- Unemployment rate
- Residents aged 25-64 with no high school diploma
- Median market income before taxes
- Core housing need (averaged rate of unaffordable, unsuitable, and "inadequate" housing)

These seven indicators were combined to create the socioeconomic status (SES) index within dissemination areas. These are small areas composed of one or more neighbouring blocks, typically with 400 to 700 persons, and are the smallest standard geographic area for which all census data are calculated. A score of 1 to 5 is assigned to each dissemination area indicating the degree of socioeconomic vulnerability, with a score of 1 representing the least vulnerable and a score of 5 representing the most vulnerable.

Lowertown, Byward Market and l'Île-de-Hull are communities nearest the Project shown in the Figure 14-6. Lowertown and the Byward Market areas have a mix of areas where the SES index for the communities' ranges from moderately vulnerable to most vulnerable. The SES index for l'Île-de-Hull on the other hand predominantly ranks as most vulnerable. This will be an important consideration when evaluating options to mitigate impacts from the closure of the bridge during deconstruction and

construction activities. The differences across communities, particularly considering those most vulnerable ones, will be taken into consideration during the design stages. Understanding potential impacts from bridge closures and other deconstruction and construction activities on vulnerable communities will assist in the development of appropriate mitigation measures.

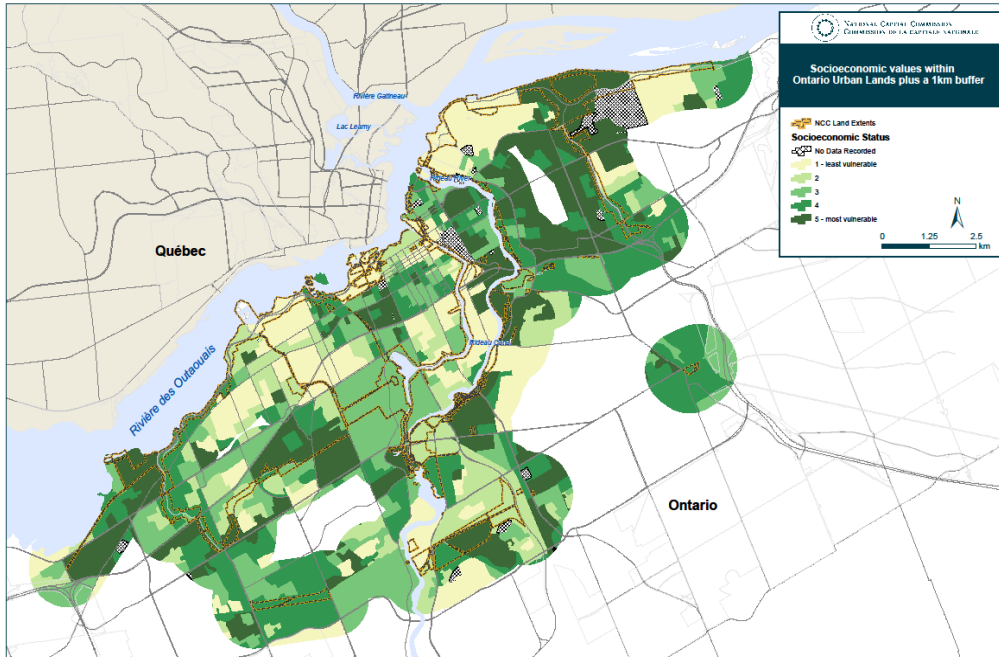
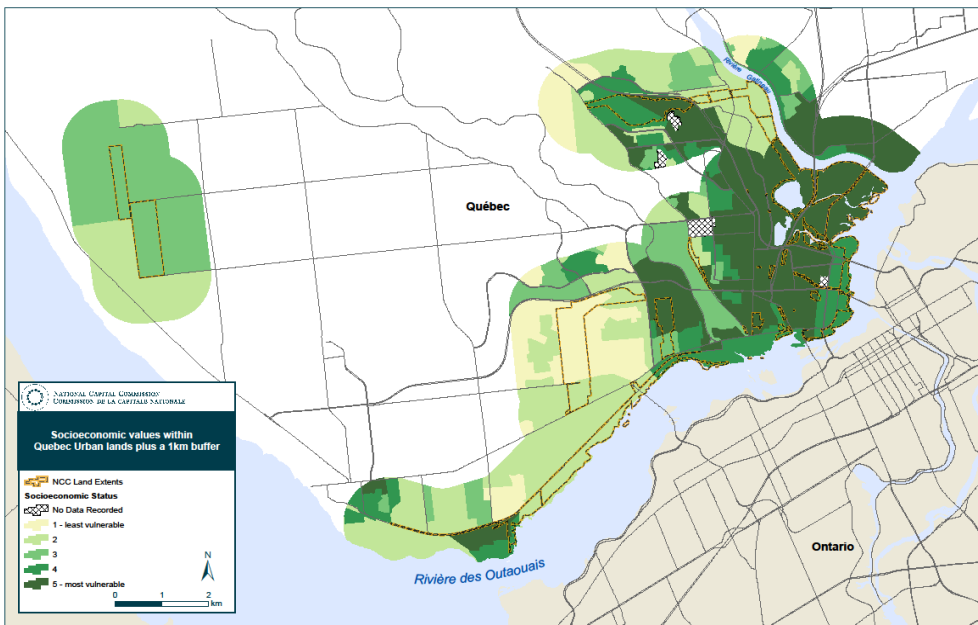


Figure 16-1: Socio-economic status of communities near the bridge – Ottawa



## Figure 16-2: Socio-economic status of communities near the bridge - Gatineau

### 16.1.1 Potential Impacts

Potential impacts and the mitigation measures discussed in this section are those anticipated from the Project as defined to date and include the comments received from respondents to public consultation outreach. Additional potential impacts will be identified as planning and design for the new structure progresses. These will be addressed as they are documented to ensure that the Project remains responsive to changes.

The enhancement measures described in Section 16.1.3 are drawn from the Planning and Design Principles (full text provided in Appendix G) because they provide a cohesive vision for the replacement of the bridge including its integration with the surrounding transportation network and public spaces.

#### 16.1.1.1 Deconstruction and Construction

##### Impacts on Mobility

During the deconstruction and construction stage of the Project, it is anticipated that the crossing will be closed to traffic, including active mobility transportation, for approximately three to four years between 2028 and 2032. Disruptions will be different for those who own their own vehicle and are able to change their commuting or travel habits compared to individuals who rely on public transit or active modes of transportation. There will be consideration of the temporary relocation of the Trans Canada Trail to the Macdonald-Cartier Bridge. This option would connect the existing trail near the north end of Jacques Cartier Park with Sussex Drive, which also forms part of the trail system.

Based on initial public consultation, widely shared concerns about the Project involved the effects of deconstruction and construction activities including the duration of the bridge's closure and the adequacy of alternative transportation routes particularly for active mobility users. The Public Consultation Report is provided in Appendix B for reference to additional details.

Concerns expressed by participants in public consultation events included that the closure will likely significantly disrupt the flow of vehicular, active mobility, and commercial transportation. In addition, concerns were expressed that the closure will likely negatively affect tourism in the region by limiting circulation between tourist destinations.

Concerns related to travel across the river were also widely shared by respondents. Fifty-four percent indicated that the length of time during which the bridge would be closed was one of the issues they were most concerned about. The effects of the closure on active mobility in particular weighed heavily on the minds of many participants. Alternative routes for active mobility during construction was the fourth-most widely shared concern, with many respondents specifying in their comments that they considered the Alexandra Bridge to be the safest crossing for active mobility. Its loss, they contended, would make it not only more inconvenient to cross the river, but also more daunting and dangerous. Longer travel times and increased traffic congestion were also identified as significant concerns by respondents.

Careful consideration must be given to the impact that construction activities will have on all bridge users and relevant stakeholders, including general traffic, traffic management operations in communities on either side of the river, public and private transit operators, emergency services, police departments, cyclists, pedestrians, and other institutional and commercial operators in the vicinity of the bridge.

Disadvantaged or vulnerable individuals who predominantly use active modes of transportation may be more significantly impacted by the closure of the bridge and may require special mitigation measures tailored to their needs.

### **Impacts to Views and Public Spaces**

Concerns were expressed regarding the potential loss of the bridge's defining role in maintaining the area's visual identity, and in connecting residents and visitors to the past. For many respondents to initial public consultation outreach in October 2020, the most appealing features of the Alexandra Bridge are tied to the sense of place it creates and the enjoyable, sensory experiences it facilitates. Respondents also spoke of the bridge's simple emotional and aesthetic appeal – its beauty, charm, elegance, timelessness, among other qualities. In this perspective, the Alexandra Bridge is not just a way to get from point A to B, but a destination in its own right whose use is associated by many with strong and pleasant memories. Access to, and enjoyment of, nearby public spaces was an issue of concern for 34% of respondents to public consultation outreach.

Given the location of the bridge, significant changes to the structure, height or proportions of the new bridge could have impacts on this key feature of the Confederation Boulevard's Ceremonial Route. Concerns were expressed that the replacement bridge would, in sharp contrast with the Alexandra Bridge, end up being utilitarian and visually uninspiring. Loss of the charm of the bridge was expressed as a concern.

A new bridge set within the Capital's cultural and natural landscape will require consideration of its impacts on views to ensure that existing protected views and viewsheds are not dominated by a future bridge design and that the openness of the Ottawa River corridor is maintained. Creating alternative active mobility routes and connections, protecting views and potentially enhancing the experience of the bridge for diverse groups of users are important aspects that can contribute to increasing the sense of place and quality of life for all residents and visitors of the capital.

### **Impacts to Landmark and Scenic Heritage**

Initial public consultation also revealed widely shared concerns about broader implications and risks tied to the bridge's role as a landmark and destination, the loss of the unique character and heritage of the bridge and loss of scenic views. Due to the bridge's heritage values and importance, the design and heritage aspects related to this Project are addressed in more substantive details in Section 16.4.

Not all improvements recommended by participants in public consultation outreach were of a functional nature. Some thought that the new bridge should be designed to attract tourists, with space to take pictures, sit down, and enjoy the views (131 mentions).

### 16.1.1.2 Operation

With the Planning and Design Principles in hand, future bridge designers and engineers are invited to introduce a world-class, signature bridge befitting the setting of our national symbols. The minimum functional requirements for the new bridge are not anticipated to increase vehicular capacity and may significantly enhance opportunities for active modes of transportation, and potentially transit.

## 16.1.2 Mitigation and Protective Measures

The Planning and Design Principles define the new bridge as functioning as both a link between vital public spaces along Confederation Boulevard and as a dynamic public space in its own right. The Alexandra Bridge offers a unique platform from which residents, tourists and visitors can stop and take in views of emblematic and symbolic elements, and ponder while observing the national treasures of the Capital and panoramic views of the River. It must continue to be the cornerstone of connection between parts of the Capital that are dominated by the National Capital function or presence, with those parts of Ottawa and Gatineau that are more local and civic in nature.

The bridge has multiple entry points and must be designed to accommodate a multitude of uses both in motion and stationary including utilitarian travel, recreation and tourist travel, sightseeing and resting. At special celebratory times, the bridge may also function as a gathering place, accommodating and supporting active uses during year-round special events such as the Capital's Winterlude Festival or Canada Day celebrations.

Whether as a crossing, a landmark, or a public space, public consultation participants made it clear that the Alexandra Bridge cannot be thought of as just any other bridge. The concerns and aspirations articulated by participants regarding the replacement Project are closely tied to what, in their eyes, makes the Alexandra Bridge unique. Depending on who you ask, the Alexandra Bridge is:

- A nationally significant heritage structure that represents a link to the past
- The safest active mobility crossing between Ottawa and Gatineau
- The most picturesque and interesting Bridge in the area
- An iconic landmark and defining feature of the Ottawa-Gatineau skyline
- Not just a crossing, but a destination in its own right for residents and visitors alike
- The shortest and most conveniently located route between the downtown cores of Ottawa and Gatineau

Together, these elements contribute to the creation of a sense of place that enriches the overall users' memorable experience of the current bridge. The Planning and Design Principles provide direction to the design team to ensure that these elements are considered in the design of the new bridge, while measures are also being considered to mitigate for the potential impacts from the deconstruction of the current bridge.

### Mobility Mitigation Measures

In response to expressed concerns, development of appropriate mitigation measures to support active mobility users during the deconstruction and construction period are key considerations in the planning process. Ideas for potential mitigation provided by participants in public consultation events included:



- Make the planning and implementation of active mobility detours a priority rather than an afterthought
- Enhance ferry service while the bridge is closed
- Add shuttles on other interprovincial bridge crossings to reduce added congestion
- Make active mobility as big of a priority as vehicular traffic in your construction milestones. Do not neglect the active mobility lane in favour of vehicular lanes
- Work collaboratively with the community to develop mitigation measures

Most of the measures proposed by respondents aim to mitigate disruptions to the flow of traffic across the river during deconstruction and construction years. In keeping with the widely shared concerns related to active mobility, the most frequently mentioned of these proposed measures was to provide adequate alternative routes for active transportation (361 mentions), including measures like expanding the carrying capacity and enhancing the safety of active mobility lanes on other interprovincial bridges. In a similar vein, some respondents proposed keeping the Alexandra Bridge open for active mobility during construction (69 mentions) and clearing pathways identified as alternative routes for active mobility during the winter (10 mentions).

IPT is working to assess viable options and determine required supporting infrastructure or services needed to implement suitable mitigation measures. Ideas being evaluated include enhancement to existing pathways to improve usability and serviceability including in winter and development of temporary structures to remove potential barriers for all users including those with reduced mobility. Conditions on the bridge may be especially difficult during winter months for those who use assistive devices and/or technology that could be impacted by snow. Preparing for additional costs or design features that can facilitate snow removal and equipping the structure for winter conditions will help ensure the infrastructure and active transportation routes are accessible to all groups year-round. Potential costs to users associated with alternatives such as ferry or shuttle services, and length of detours are factors under consideration particularly considering potential financial burden on individuals from disadvantaged communities.

During the deconstruction and construction years, the other interprovincial crossings are expected to be able to compensate for re-routed traffic outside peak hours. Length of detours will be considered to manage the volume of additional emissions created by longer trips. During peak hours, special traffic management measures may need to be implemented to reduce congestion and reduce idling. IPT will work with both the Cities of Ottawa and the City of Gatineau to develop appropriate traffic management strategies. Strategies will also take into consideration specific needs to support circulation between tourist destinations to mitigate potential impacts to business operations on both sides of the river. Different user groups will also be engaged to find workable solutions to transportation challenges.

In the design of the new bridge, active mobility was again the focus of many proposals. Suggestions to improve safety and mobility on the bridge included:

- Better separation of cyclists and pedestrians (615 mentions)
- A smoother surface for active mobility than that of the existing wooden boardwalk (172 mentions)
- Dedicating the bridge entirely to active mobility (113 mentions)
- Installing rest stops (36 mentions)
- Covering the active mobility lane to shelter its users from the elements (11 mentions)

The existing segregated pathway is a highly prized feature that many public consultation participants hope will be enhanced for the experience and safety of active mobility users and to promote sustainable transportation throughout the region. The things that participants would most like to see improved in the new bridge are primarily functional in nature:

- Separation of pedestrians and cyclists
- Better surfaces
- Enhanced public transit integration
- Expanded carrying capacity
- Overall, ensuring that the bridge meets the highest design and construction standards

The inclusion of a separate and protected laneway for mixed-use active transportation methods is suggested to increase the use of alternate modes of transportation, such as biking or walking. The Planning and Design Principles for the bridge will require the pedestrian area of the bridge to meet the highest standards of accessibility in the bridge's function as both an active transportation connection and as a contemplative space, such that all Canadians and visitors can benefit from a full and equitable experience of the bridge. This includes requirements regarding travel lanes, rest areas and interpretive elements to be installed on the bridge. Refer to Figure 8-1, which provides a conceptual section of the potential future traffic lanes.

The new bridge will be designed to accommodate all vehicles, including trucks and tour buses. However, as it is part of Confederation Boulevard, commercial trucks would be rerouted to other bridges, such as the Macdonald-Cartier Bridge. Notwithstanding any future changes, it is unlikely that commercial trucks would use the new bridge. The current approaches limit the amount of traffic that can flow across the bridge. Traffic volumes on the new bridge are not expected to increase greatly given the network to which it is connected, and the Functional Requirements (see Section 8.3) established for the new bridge.

The replacement bridge design is expected to ensure the physical continuity of its unique and symbolic character, connectivity for pedestrians, cyclists and drivers and a seamless connection between two cities and two provinces in Canada's Capital.

### **Mitigation Options for Loss of Public Spaces**

During the deconstruction and construction years when the bridge and adjacent areas are not safely accessible to the public, there will be a loss of the public space currently provided by the bridge. Other nearby public venues such as Kīwekī Point (formerly named Nepean Point), Jacques-Cartier Park and the grounds of the Canadian Museum of History will play key roles in providing temporary venues for celebrations and events.

Measures to mitigate the loss of aesthetic and heritage values related to this Project are further discussed in more substantive details in Section 16.4.

The Planning and Design Principles describe concepts that will help to mitigate for the potential loss of the bridge's defining role in maintaining the area's visual identity and provide guidance as to the design of the new bridge in hopes of addressing concerns regarding its physical and aesthetic characteristics.

In keeping with recommendations for improvements provided by public consultation respondents, the new bridge should be designed to attract tourists, with space to take pictures, sit down, and enjoy the views (131 mentions). Respondents also emphasized the importance of beauty in the bridge's design, of a kind that would blend in harmoniously with the architecture of nearby historic sites (59 mentions). A small number of respondents recommended integrating nature into the design, including trees and green strips (11 mentions). These recommendations along with additional public comments will be used to direct mitigation efforts during deconstruction and construction and will influence the design of the new bridge.

### **Protection of Landmark and Scenic Heritage**

The bridge boardwalk offers spectacular panoramic views towards the River shorelines and upriver, with these views encompassing the Chateau Laurier, the Rideau Canal, Parliament Hill and the whole Parliamentary Precinct, the Supreme Court, Library and Archives Canada, and beyond to the Islands and the Portage Bridge.

Protection of scenic views is directed by the NCC's Canada's Capital Views Protection Plan, (NCC, 2007), which mandates that views from key viewpoints shall be preserved and enhanced to ensure the visual integrity and symbolic primacy of the Parliament buildings (Centre Block, Parliamentary Library, Peace Tower) within the setting of the Ottawa River corridor.

Of these key Viewpoints, Viewpoint #6 located on the existing Alexandra Bridge boardwalk close to the Québec approach, is a "Control Viewpoint" that is used to establish maximum background heights within the City of Ottawa's Core area, west of the Canal, to ensure that no background buildings impact views of the silhouette of the Centre Block and Peace Tower. Future bridge design development will be required, through views analysis, to ensure that this viewpoint is maintained for the full enjoyment of Canadians and visitors of the Capital.

### 16.1.3 Enhancement Measures

The six guiding principles described in Planning and Design Principles are based on the Project mission statement:

*“To create a sustainable interprovincial transportation connection that will prioritize active mobility and highlight the symbolic importance of the site to all Canadians for many generations to come.”*

They will guide the design development of the replacement bridge and are based on federal plans, policies and studies prepared for the areas in and around Alexandra Bridge and Confederation Boulevard within the Capital Region. The Principles incorporate feedback received through the first phase of the stakeholder and public consultations conducted in 2020 and through a peer review exercise internal to PSPC and NCC, including review by the NCC’s ACPDR and ACUA, which respectively provide recommendations on design excellence as well as inclusive and universal accessibility.

The Planning and Design Principles, provided in Appendix G, offer a vision for the future operation and enhancement measures of the new bridge.

*Principle (1): Mobility and Continuity of the Urban Fabric*

**The new bridge must provide better connections for pedestrians and cyclists at the Gatineau approach to the riverbank, Jacques-Cartier Park, and the grounds of the Canadian Museum of History.**

Improvements in public access to the shorelines through pathway improvements for pedestrians and cyclists around the new bridge must increase permeability and unification of the shoreline areas and the adjacent urban fabric to increase use of these spaces.

- A bridge design must facilitate connectivity by providing safe, direct, visible links (i.e., indications marking sites and distances between them) that are usable throughout the year, including during winter months.
- Design solutions must resolve elevation differences between the bridge and shorelines, and the diagonal crossing pattern at the Laurier Avenue and des Allumettières Boulevard intersection to access De L’île pathway.
- Bridge design must accommodate proposed municipal road network configurations at the intersection at Laurier Street/des Allumettières Boulevard which reclaims space from the roadway (i.e., removal of right-hand turn lane onto Alexandra Bridge), simplifies pedestrian crossings and integrates with the bikeway along Laurier Street.
- Design concepts should consider the public realm and prioritize active users by visually shielding and better integrating the existing marina parking and museum service vehicle requirements.

**The design of the new bridge must provide direct pedestrian connections to other important urban elements in its immediate context taking into consideration challenges due to the steep, vegetated rock escarpments of the Ottawa River shoreline.**

- The design of the new bridge must consider and complement the design proposal for Kiweki Point (formerly named Nepean Point), which includes the Pìdàban pedestrian bridge (vertical clearance height of 5.3 metres) over St. Patrick’s Street, linking the Point to Major’s Hill Park.
- A new bridge design must review and ensure integration with the NCC’s redesign plan for Major’s Hill Park, which includes reclaiming spaces along Pioneer way (the former rail corridor),
- improved universal accessibility between the park plateau and the shoreline, as well as improvements to interfaces and connections along Confederation Boulevard.
- Pedestrian connectivity from the bridge must include safe, universal accessible linkages to locations below the embankment on the southern approach of the existing Alexandra Bridge to provide access to the Rideau Canal Locks and the Ottawa River Pathway. These linkages must be consistent with the NCC’s vision for a long-term Waterfront Promenade between the Rideau Canal Locks and Rideau Falls.

**Alexandra Bridge replacement offers the opportunity to accommodate a multitude of active uses such as sightseeing, resting, strolling, jogging and cycling, as well as lookout points for viewing scenic features.**

- The design of the new bridge must provide generous pedestrian and cycling spaces, with streetscape elements that should be custom designed to ensure integration of the Grand Esplanade, reflective and well-coordinated with Confederation Boulevard designs.
- Priority must be given to the comfort, safety, and well-being of pedestrians, as well as to the movement of cyclists (tourists and commuters), ensuring fluidity throughout the year through well-defined exclusive corridors free of elements that impede movement, with adequate buffers where appropriate.
- A thoughtful and cohesive design of the pedestrian esplanade on the interprovincial bridge must meet the guidelines of the Capital Pathway Strategic Plan (NCC, 2020a), as well as the Confederation Boulevard Guidelines, Management and Stewardship of Our Capital Legacy (NCC, 2011). A minimum width of four metres and a separation of pedestrians from bidirectional bikeways with a focus on the esplanade’s quality for user experience (sights and sounds) must be incorporated.
- Cycling slowdown zones at the bridge’s approaches should be provided.

#### *Principle (2): Public Spaces and Civic Experiences*

The visual integrity of the cultural landscape shall be preserved with a seamless integration of the new bridge into the existing and evolving urban and natural environment context. The new design must provide continuity with the existing urban fabric, with materials and scale appropriateness contributing to the seamless visual integration. Landscape integration along the shorelines and approaches shall maintain the green cohesiveness of the Ottawa River corridor.

**Beyond being a civic space in its own right, the new bridge must function as a multimodal transportation connection and a connector of major civic and public spaces.**

- The new bridge must continue to serve as a vital link between communities, as a public space to move-through and go-to.
- In keeping with the bridge's role and purpose of linkage between entry gateways and nodes of Confederation Boulevard, the new bridge design must integrate with the future design of the Gatineau node at the intersection of des Allumettières Boulevard and Laurier Avenue.
- As a vessel, the bridge must visually and structurally support the vitality of the Capital Realm.
- Lookouts, rest areas, and programmable areas outside the travel lanes should be flexible and safe to allow for gatherings and circulation of various sized groups, including the infrequent large public gatherings that may occur on the bridge.

**The Bridge should be designed as an urban agora and reminders of the Indigenous community should be incorporated into the development of public space. The outcomes of ongoing discussions with the Algonquin Nation will play a key role.**

*Principle (4): Preserve Views and Celebrating the Legacy*

The Algonquin Nations have been stewards of the Ottawa Valley since their ancient oral history records their stories of creation in the territories and waterways of the land. The design process of the bridge will provide opportunities for Indigenous engagement and dialogue throughout all development phases. Designers must seek to understand traditional knowledge and incorporate the Algonquin Nation's perspectives and values.

*Principle (6): Universal Accessibility, Legibility and Wayfinding*

In keeping with the principle of creating an interprovincial transportation connection that prioritizes active mobility, accessibility must be intrinsic to the bridge design of all pedestrian and cycling accesses at the approaches and along the length of the bridge, as well as in connections to other surrounding urban features and structures (parks, museums, etc.). Accessible and inclusive design must follow the recommendations of the Best Practices Guide to the Accessible Design of the NCC's Outdoor Spaces, as a minimum, as well as requirements of the Accessible Canada Act and any applicable regulations.

**In addition, any spaces dedicated to pedestrian usage (including lanes and lookout spaces) on the bridge should be accessible to all users by following the Universal Design principles. Universal Design encompasses seven general principles:**

- Equitable Use
- Flexibility in Use
- Simple and Intuitive Use
- Perceptible Information
- Tolerance for Error
- Low Physical Effort
- Size and Space for Approach and Use

Bridge design features must ensure inclusive, safe, equitable and universally accessible gathering public space(s), exemplified through attention to lighting, interfaces that include pathways or railings, viewing areas, visual sightlines, furnishings, structural features and impacts of inclement weather, amongst others.

Designing the bridge in parallel with a universally accessible wayfinding system would allow ease of access to important information whether it be to historical facts on an interpretation panel, orientating signs or security information.

Current redevelopment plans are underway to enhance the landscape experience and observation points, including universal accessibility and the reestablishment of a pedestrian connection between Kìwekì Poooint (formerly named Nepean Point) and Major’s Hill Park. The “Big River Landscape” concept plan for Kìwekì Point (Janet Rosenberg & Studio) began construction in 2019 following an international design competition in 2017. It is anticipated that this project will be completed in late spring 2023 – several years prior to the start of the Project.

**Signage on the new bridge structure (site identification, wayfinding, operational, regulatory, interpretative) is required to be developed through an integrated design approach, providing specific locations for implementation during the design process to avoid after-thought solutions.**

- Signage should contain clear and easy-to-understand information for all, and text must be provided in both English and French. The Algonquin language may be incorporated in pedestrian-focused signage to raise awareness, encourage, and strengthen its revival.



## 16.2 Economic Context

The following information provides a brief overview of the Canadian economic system as a whole and highlights economic activity within the NCR (the Project footprint) and where applicable, identifies potential impacts on the labour force and the Gross Domestic Product (GDP) growth, as they relate to the Project. This section also includes a summary of proposed mitigation and enhanced measures.

### Canadian Economy

Canada is one of the largest economies in the world, forming part of the globe's wealthiest nations. In 2020, the country's population was reported at 38 million. Canada's labor force is relatively small, in comparison to larger economic powers, slightly under 19 million. The economy is largely influenced by foreign trade and the service industry, which employs approximately  $\frac{3}{4}$  of Canadians. Overall, the economy is healthy, with the GDP reported at 1.647 trillion (Canadian dollars) in 2020. It is expected to remain stable over the coming years.

There are several indicators that can be attributed to a healthy economy. For the purposes of this preliminary analysis, a brief overview of the Gross Domestic Product (GDP) and the labour force (employment) is highlighted below.

It is noted that the Project will have an indirect impact on Canada's economy as a whole, and a direct impact on the NCR.

### Gross Domestic Product

Amidst the pandemic, the Canadian economy has experienced a sharp decline (2020), reported at **-5.4%** (refer to Figure 16-3). Currently, the economy remains steady (healthy), with growth reported at 5.05% in 2021 and forecasted at 4.65% in 2022.

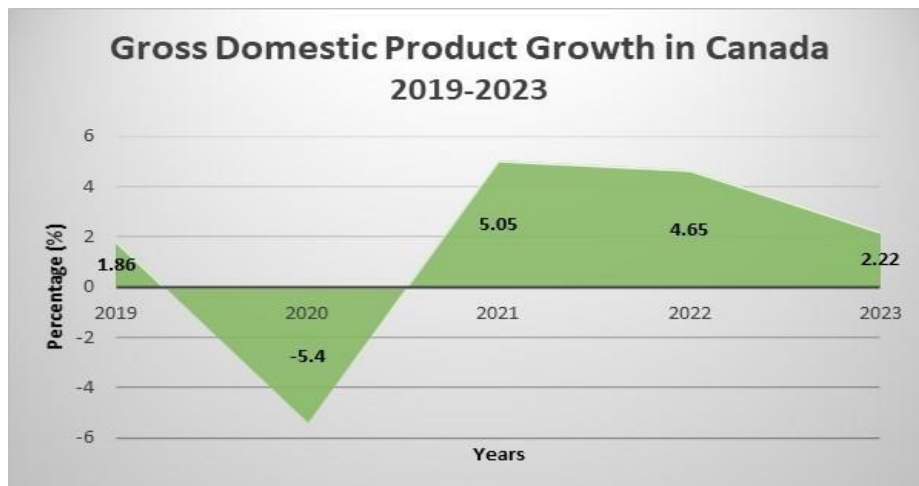


Figure 16-3: Gross Domestic Product Growth in Canada (2019-2023)



Within the province of Ontario – the GDP (2019) was reported at \$798 billion. At the onset of the pandemic, the GDP experienced a significant decline, decreasing by \$41.4 billion.

The GDP in the NCR also experienced a decline in 2020, reported at **-3.2%**. In 2017-18, the GDP growth within the NCR was reported as the seventh (7) highest amongst twenty (20) major cities in Canada. Major contributors to the GDP are High Technology and the Federal Government sectors, which account for about \$25 billion or slightly over 37% of the total GDP (in the NCR). As of 2019, Ottawa-Gatineau’s real GDP was reported at approximately \$67.24 billion (Statistics Canada, 2021).

Table 16-1 highlights the current main drivers of the economy with the NCR.

**Table 16-1: Industry Sectors that Contribute to the NCR’s GDP (in \$ billions)**

Industrial Sectors (in decreasing contribution)	Contribution in Millions (~\$)	Percentage (%) of GDP
High Technology	12.71	18.9
Federal Government	12.23	18.2
Finance, Insurance, real estate	6.99	10.4
Trade	6.32	9.4
Health and Education	5.04	7.5
Construction	2.69	4.0
Tourism	1.35	2.1
Others	19.83	29.5
<b>TOTAL</b>	<b>\$67.2B</b>	<b>100</b>

Source: Conference Board of Canada, Metropolitan Outlook (accessible online at: [City of Ottawa Webpage](#)).

Notably, the NCR experiences minimal economic flux (aside from during the current pandemic), contrary to other municipalities, due primarily to the Federal Government sector which has been stable over the years.

### Labour Force in Canada and Ontario

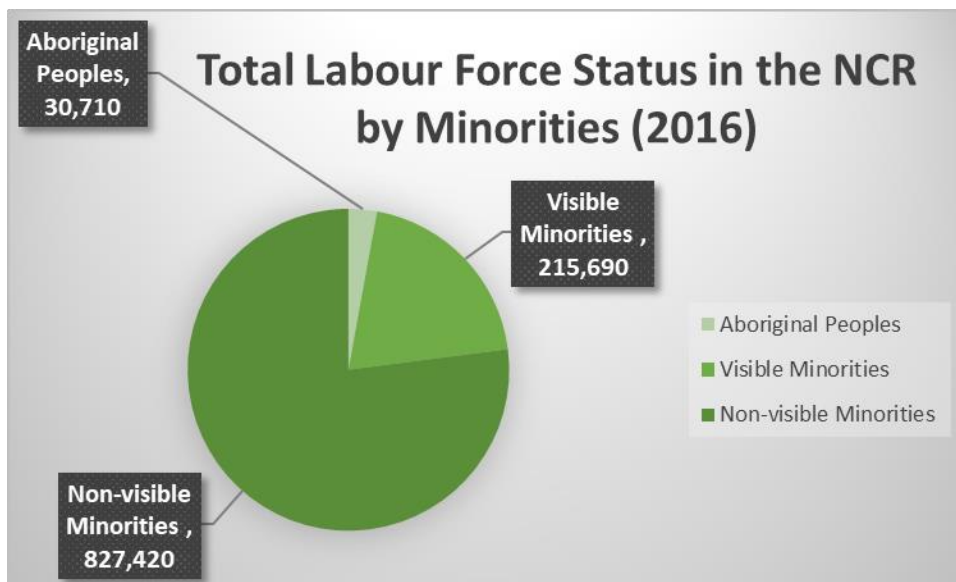
The COVID-19 pandemic has severely affected the labour market, with millions of Canadian workers experiencing either loss of employment or reduced working hours.

Prior to the pandemic, the labour force in Canada grew by +1.1% in 2018-19 from the previous year (\$19.7M) all provinces during this time reported moderate growth. Notably, Ontario experienced the largest increase, during this year at +1.8%, with the total labour force was reported at 7.3M in 2019 (Statistics Canada, 2021).

## National Capital Region

Within Ottawa-Gatineau (NCR), the labour force reflects the diversity of the region, which includes Aboriginal peoples, visible and non-visible minorities, male, female, transgender and non-binary workers (refer to Figure 16-4: Total Labour Force Status in the NCR by Minorities). In 2016 the total labour force comprised of approximately 1.1million workers, whereby females formed slightly higher than 51% of the overall force. Males accounted for a higher percentage of those employed – 51% vs female at 49.2%.

Of the 1.1 million people, Aboriginal peoples accounted for approximately 30,710 or 2.85%, visible minorities accounted for 215,690 individuals or 20%, and non-visible minorities 827,420 individuals or 77%. Of note, data on non-binary and transgender status within the labour force was not reported (Statistics Canada, 2017).



Source: Statistics Canada, 2016 Census of Population.

**Figure 16-4: Total Labour Force Status in the NCR by Minorities**

From January 2016 to March of 2016 unemployment rates remained relatively stable. There was a slight increase in unemployment from April to October of 2016. During this time, it was reported that women were unemployed at rate marginally higher than men. Table 16-2 below highlights the total labour force status in 2016 (Statistics Canada, 2017).

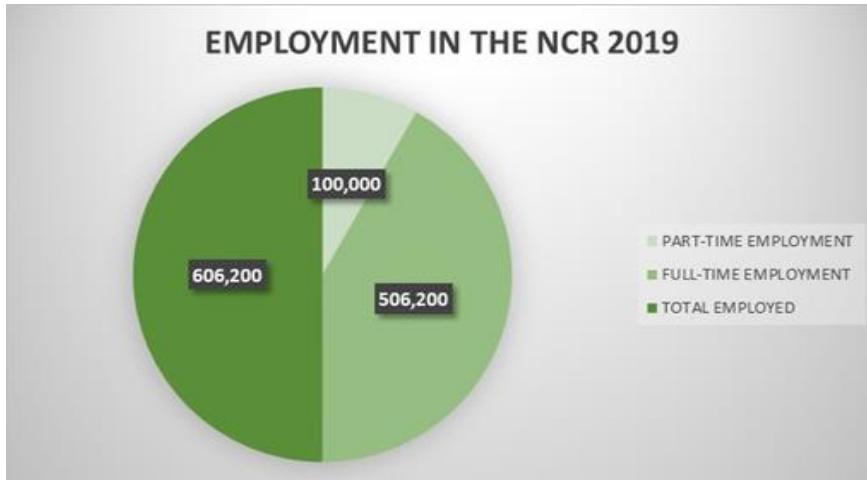
**Table 16-2: Ottawa-Ontario Census Metropolitan Area Labour Force Breakdown by Gender**

Labour force Status 2016	Ottawa - Gatineau / Ontario - Quebec Census Metropolitan Area		
	Total	Male	Female
<b>Total - Population aged 15 years and over by labour force status</b>	1,073,820	519,960	553,860
<b>In the Labor Force</b>	727,050	370,620	356,425
<b>Employed</b>	676,480	343,175	333,300
<b>Unemployed</b>	50,570	27,445	23,125
<b>Not in the labor force</b>	346,770	149,340	197,430
<b>Participation rate</b>	67.7	71.3	64.4
<b>Employment rate</b>	63	66	60.2
<b>Unemployment rate</b>	7.0	7.4	6.5

Source: Statistics Canada, 2016 Census of Population.

In the first reporting quarter of 2017, both the employment and unemployment rate remained relatively stable. As of the last reporting quarter, the unemployment rate experienced a slight increase in comparison to the unemployment in 2018 at approximately 4.5%.

As reported in Ottawa's employment business journal, (Ottawa Business Journal. 2018), the employment rate (Ottawa-Gatineau) remained stable. In the third reporting quarter of 2018, approximately 558,000 people were employed - 79% identified as female and 88% identified as male. In 2019, pre-pandemic, the total number employed increased by 48,200 or about 9%, as highlighted in the adjacent graph. The total employed during 2019 was reported at 606,200 people (Statistics Canada, 2017).



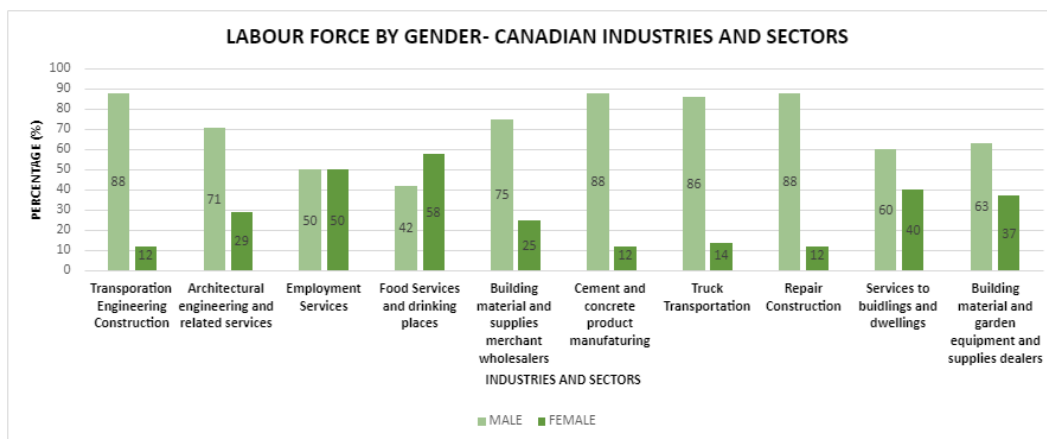
Source: Statistics Canada, 2016 Census of Population.

Figure 16-5: Employment in the NCR (2019)

The labour force experienced a sharp decline in 2020, as a result of the pandemic.

Statistics highlight that there is a disparity within the labour force amongst male and female. Figure 16-6 captures the ratio of male to female in select industries and sectors. Primarily, the largest disparity evidenced by the data below is within the following industries/sectors:

- Transportation Engineering Construction
- Cement and concrete product manufacturing
- Repair Construction
- Building material and garden equipment and supplies dealers



Source: PwC, 2021

Figure 16-6: Labour force by gender

An important aspect of the pandemic is its disproportional impact between genders (Statistics Canada, 2021). Gender employment gaps are evident in various industrial sectors - women being more affected than men.

The potential impacts on employment and the labour force, including the real GDP, within the NCR, are further described in Section 16.2.1. These impacts and how they may affect women, men and gender diverse people are important conversations during the impact assessment stage and throughout the Project. Significant efforts will be made to minimize potential impacts to all marginalized groups.

### 16.2.1 Potential Impacts

As part of the Project, a socio-economic study was commissioned by PSPC. The study (produced by Price Waterhouse Cooper (PwC, 2021), assessed the economic footprint of the Project (and surrounding areas) and provided a quantitative assessment on the GDP, and employment indicators within the NCR.

- **Employment:** The Project will primarily influence the construction industry and its specialized sub-industries. It is expected that there will be a greater demand for labour and raw materials (at the start of construction in 2028), which in turn generates additional demand for the workers within this employment sector. The potential impact on employment is further elaborated upon in the deconstruction/construction and Operation stages.
- **GDP:** It is expected that the economic activity generated by the Project will significantly impact the Ottawa-Gatineau GDP. As of 2019, the construction sector accounted for approximately \$2.69 million or 4% of Ottawa-Gatineau's GDP (\$67.24 billion).

The economic impact of the Project has been analyzed using the Input-Output approach. How various economic indicators, such as employment and GDP, are affected directly, indirectly and at an induced level is captured below. For the purposes of assessment, direct, indirect and induced are defined as follows:

- **Direct:** Generated from firms' expenditure on employees and suppliers
- **Indirect:** Generated from business-to-business expenditure associated to the Project
- **Induced:** Generated from household spending (or employees within business' supply chain spending)
- The sum of the direct, indirect and induced impacts yields the total economic impact

The Project will encompass the deconstruction of the existing bridge followed by the construction of the new bridge. Deconstruction and Construction timeline is anticipated to be approximately four (4) years (2028-2032). Once the deconstruction/construction is completed, the operation and maintenance stage will commence (2032). Both stages are expected to create some economic activity as explained in the sections below.

It is recognized that the construction and deconstruction as well as the operation and maintenance of the bridge will require capital expenditures. Such expenditures may be viewed as negative impacts

however, economic activity including GDP growth and the creation of employment is expected to off-set costs related to deconstruction and construction.

### 16.2.1.1 Deconstruction and Construction

#### Impact on Employment

The deconstruction and construction of the bridge is anticipated to generate economic activity within the industries identified below. Approximately 45% or 2,990 full time equivalent (FTE) employment opportunities will be created by this Project in the transportation engineering construction within the Ottawa- Gatineau area.

In addition to the above, approximately 43% or 2,571 employment opportunities will also be created by this project within other industries such as cement and concrete product manufacturing, truck transportation, and banking.

Table 16-3 highlights the potential impacts on employment within the Ottawa – Gatineau area, by industry.

**Table 16-3: Annual employment impact of Alexandra Bridge Replacement Project construction for Quebec, Ontario and Canada in FTE per year, by industry**

Industry	Employment (FTE, person-years)				Percentage of generated Employment by Industry
	Quebec	Ontario	Rest of Canada	Total (FTE)	
Transportation engineering construction	1,679	1,311	1	2,991	45%
Architectural, engineering and related services	115	114	16	245	4%
Food services and drinking places	69	66	17	152	3%
Building material and supplies merchant wholesalers	57	75	6	138	2%
Cement and concrete product manufacturing	56	79	1	136	2%
Truck transportation	62	43	8	113	1%
All other industries*	1,167	1,404	243	2,814	43%
<b>Total</b>	<b>3,205</b>	<b>3,092</b>	<b>292</b>	<b>6,589</b>	<b>100%</b>

Source: PwC, 2021

\* Other top industries include cement and concrete product manufacturing (2%), truck transportation (2%) and banking and other depository credit intermediation (1%).

## Direct, Indirect and Induced Impact on GDP

In addition to the impact on employment, it is anticipated that the Project will contribute to the growth of the GDP within the Ottawa-Gatineau area. The demand for supplies and construction/trade workers is expected to rise significantly during the deconstruction and construction stage along with the operation and maintenance, which will be further discussed below.

Table 16-4 summarizes the direct, indirect and induced impact on the GDP (construction industry) within Ontario, Quebec and Canada as a whole. As highlighted the project will inject, over a period of four (4) years, about \$675 million into the Ottawa – Gatineau GDP.

**Table 16-4: Alexandra Bridge Replacement Project Impact on GDP (\$ millions)**

Industry		Ontario	Quebec	Rest of Canada	Total (Millions)
<b>Construction (Cumulative, 4 years)</b>	<b>Direct</b>	124.9	148.8		273.7
	<b>Indirect</b>	142.3	107.7	26.4	276.4
	<b>Induced</b>	84.4	66.7	16.6	167.8
<b>Total construction</b>		351.6	323.2	43.0	717.9

Source: PwC, 2021

Given the scale and significance of the Project, the total deconstruction and construction of the bridge will fundamentally require strategic planning and sound capital expenditures (estimated at \$350M year (1) one). Cost associated to this stage of the Project will be off-set by the positive economic activity generated through GDP growth (approximately \$675 million in the Ottawa-Gatineau area) and the creation of employment (approximately 6,297 FTE). The IPT will ensure that all stages of the Project align with Treasury Board Secretariat’s directives and policies. Throughout the life of the Project, PSPC and NCC will demonstrate sound stewardship and implement financially responsible management practices that maximize the long-term economic advantage to the Crown and provides best value to the Canadian taxpayer.

### 16.2.1.2 Operation and Maintenance

#### Impact on Employment

The operation and maintenance of the bridge may generate economic activity within the Ottawa – Gatineau area. Table 16-5 highlights a total of about 6 FTE opportunities will be created within the repair construction industry and about 3 FTE opportunities in other related industries.

**Table 16-5: Annual employment impact of Alexandra Bridge Replacement Project – Operating and Maintenance for Quebec, Ontario and Canada, in FTE per year\***

Industry	Quebec	Ontario	Rest of Canada	Total (FTE)
Repair construction	2	4	1	7
All other industries	2	1	0	3
<b>Total</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>11</b>

Source: PwC, 2021

\*Due to rounding, total impact value may not equal the sum of direct, indirect and induced footprints.

### Direct, Indirect and Induced Impact on GDP

The operation and maintenance of the bridge is also anticipated to create a certain economic activity throughout the years of operation. It is worth noting that the economic activity created by this stage will not yield the same activity created by the construction stage. Notwithstanding, it is important and will be discussed accordingly. Operations and maintenance impacts are calculated based on the annual average impacts over the life of the Replacement Bridge. The average Direct, Indirect, and Induced economic impacts of the Project on the GDP are outlined in millions in Table 16-6.

**Table 16-6: Alexandra Bridge Replacement Project Impact on GDP (\$ millions) \***

Industry		Ontario	Quebec	Rest of Canada	Total (Millions)
Operations and maintenance (average annual)	Direct	0.4	0.3		0.6
	Indirect	0.1	0.1	0.2	0.2
	Induced	0.2	0.1	0.2	0.3
<b>Total annual operations and maintenance</b>		<b>0.6</b>	<b>0.5</b>	<b>0.4</b>	<b>1.1</b>

Source: PwC, 2021

\*Due to rounding, total FTEs and total impact value may not equal the sum of direct, indirect and induced footprints.

In summary, the Project will impact the NCR's economy and Canada, as a whole. Impacts specific to infrastructure investment and the construction sector (increased employment and activity) are expected. The total contribution to the GDP during construction (2028 to 2032) is estimated at \$718 million, generating 6,589 jobs in Ottawa and Gatineau and Canada. In addition to these positive impacts, it is anticipated that there will be lower operation and maintenance costs.

## 16.2.2 Mitigation and Protective Measures

It is important to note that the bridge closure will affect the NCR's population, the active users, and businesses within proximity to the bridge including the wharf and the boat launch. The active users such as cyclists and pedestrians who utilize the bridge will be required to use detours that have been put in place and rely on the availability of other means of transportation to cross the river.



The bridge closure has the potential to reduce tourism (contributor to the NCR's GDP) in the area which will affect the businesses operating within proximity to the bridge. This includes NCC tenants as well as the wharf, boat launch and marina in Jacques-Cartier Park. All NCC commercial leases are expected to continue during the construction period. The IPT is dedicated to working with all small business owners, including NCC tenants, to develop strategic plans to mitigate impacts.

To mitigate the negative impacts of the bridge closure on the active users and on affected businesses, the IPT will explore a few different measures including:

- Alternative temporary relocation option for important infrastructure such as the wharf, boat launch, marina and parking areas to support continued operations during the construction period will be assessed as part of the Project
- The implementation of water taxis or ferry services
- The planning of rerouting strategies and detours
- The implementation of a comprehensive bypass system
- The development of a Construction and Traffic Management Plan

The Project has the potential to have a positive economic impact on Indigenous communities. In fact, and as mentioned in Section 5.6, the significant amount of contracting and employment associated with the bridge planning, construction and operations will offer many opportunities for Indigenous workers and companies to obtain economic benefits from the Project.

### 16.2.3 Enhancement Measures

As identified in the above-mentioned PwC socio-economic study (PwC, 2021), this Project has the potential to generate wider socio-economic impacts not captured in the assessment above. The wider socio-economic benefits have been highlighted throughout the DPD, specifically in Section 19.2.3 as it relates to Indigenous communities and in Section 16.1 as it relates to social benefits.

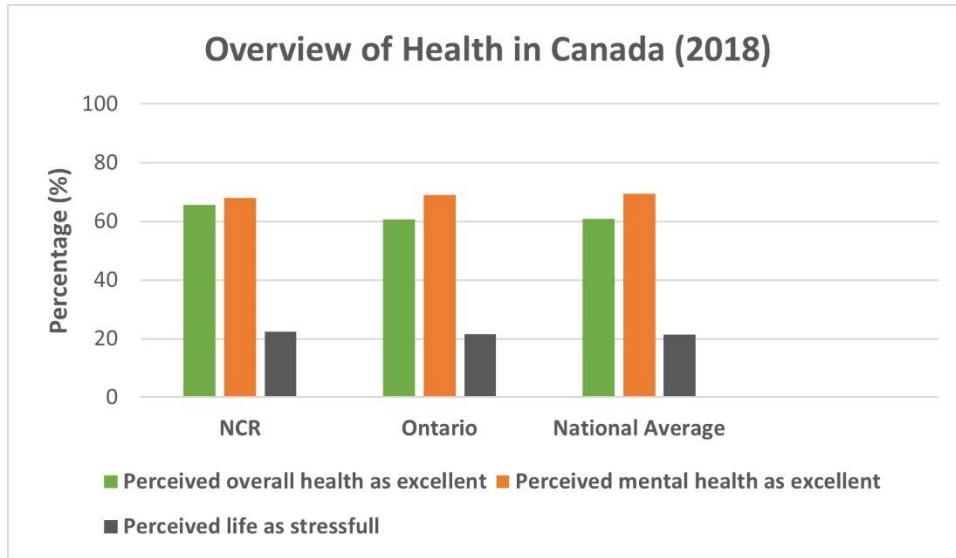
## 16.3 Human Health Context

This section provides a brief overview of the human health of residents in the NCR, including physical and mental, as well as how these may be impacted by the Project. Potential mitigation measures to minimize such impacts have also been highlighted. Note that the Project is in the planning stage and the full extent of impacts on such things as human health, socio-economic conditions and in some cases environmental are unknown. Extensive studies and assessments are underway to better understand potential impacts and the direct/indirect affects these will have on residents. Findings of these studies and assessment along with public consultation and stakeholder input will be utilized to form and implement sound mitigation measures.

There are various aspects which influence the health and well-being of a community and its residents. It is largely dependent not only upon the genetics of the population, but also upon the environment within which those individuals live. Health is also based on what people eat, their employment status and working environment, housing, access to healthcare, and the quality of both air and water.

As identified in Sections 16.1 and 16.2, the NCR provides a healthy stable environment for residents. Overall, the quality of life in the region is regarded as being very high. Ottawa is frequently rated as one of the top cities to live in, not just in Canada, but globally (Mercer, 2019).

Figure 16-7, highlights the percentage of Canadian residents perceived overall health in the NCR, in comparison to Ontario and the National average.



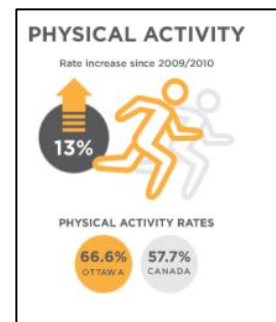
Source: Statistics Canada. 2017

**Figure 16-7: Overview of Health in Canada (2018)**

Residents have year-round access to a wide range of activities, events and spaces that help promote healthy lifestyles and choices such as multi-use pathways, rowing clubs, marathons, ski resorts, cross-country trails and greenspace, etc. The Alexandra Bridge supports various activities and closure of this will affect active transportation (cyclists, pedestrians, and others), access to public realm and greenspace in the Region which is often used for physical activity purposes.

The west deck of the bridge provides scenic views of the Ottawa-Gatineau skyline, the Ottawa River and Parliament Buildings. It is used by pedestrians, cyclists and others and notably is on the official route of the Trans Canada Trail. Its central location in the heart of both the Ottawa and Gatineau downtown core, coupled with its scale make it a key active-transit corridor for local residents and workers. The Alexandra Bridge attracts 32% of daily interprovincial bike trips while simultaneously providing one of the more scenic and low-stress routes for cyclists (City of Ottawa, 2013). Each day the bridge carries approximately 2000 pedestrians and 1300 cyclists, as of 2009.

In 2009, within the NCR, it was reported that physical activity rates had increased by approximately 13%, with 67% of Ottawa residents reporting that they are physically active during leisure time, as highlighted in the adjacent image. (Physical Activity diagram, Ottawa Community Foundation (2009))



Physical activity is an essential part of daily life, supporting good health, both physical and mental. The bridge provides access to greenspace, the National Gallery of Canada, the Canadian Museum of History and the Mint Museum as well as two major parks: Major's Hill Park (Ottawa) and Jacques-Cartier Park (Gatineau) which are venues for celebrations such as the Canadian Tulip Festival and the Canada Day festivities.

Academic scholars report that the reduction of various chronic diseases and associated symptoms, including anxiety, obesity and cardiovascular disease, has been associated with the presence of and access to green space. Such space also provides a number of environmental health benefits and has been shown to minimize the likelihood of flooding, improve air quality, reduce traffic noise and provide cooling and shade. Additionally, studies have shown that greenspace(s) reduces stress and also bolsters good mental and physical health. Most communities encompass green space, for the reasons identified above.

The Alexandra Bridge and surrounding areas were built to support and promote active transportation. Many communities are being built in keeping with the Government of Canada's commitment to support and facilitate active healthy living. Mobilizing Knowledge for Active Transportation (MKAT) is one of the collaborative projects that aims to gather and share knowledge that accelerates effective approaches to active transportation across Canada. MKAT recognizes that designing communities to support active transportation is key to fostering physical activity and producing a variety of public health benefits. The bridge plays a fundamental role in this.

It is worth noting that the population of Ottawa is projected to grow by 43.7% from ~1.3 million in 2020 to 1.50 million in 2046. This growth will have a direct impact on the region's overall population and specifically on the densification of the city, impacting human health. With the expected rise in the population there is a heightened requirement to focus on increasing active transportation that identifies multi-sectoral benefits (e.g., economy, health and environment).

The newly constructed bridge will comprise of additional and wider laneways which will further support physical activity for cyclists and pedestrians alike.

### 16.3.1 Potential Impacts

As mentioned, the Project is centered in the heart of Canada's NCR, which means its closure and replacement will have impacts on the various commuters, communities, and surroundings. During deconstruction and construction stages, some of the main concerns related to the residents' health and overall well-being are Noise/vibration, Air quality/Dust, loss and/or decreased access to public realm and green space and longer commute times. These impacts are further discussed under the deconstruction and construction section as they form part of concerns expressed by residents.

In addition to the impacts highlighted above, during the operation stage, one of the main concerns is for residents' safety and overall well-being including their protection from violence or specifically gender-based violence in public spaces. This is further discussed under the operation section as it is one of the main concerns during that stage.

### 16.3.1.1 Deconstruction and Construction

The deconstruction of the Alexandra Bridge will affect the following in relation to the health of residents and their communities:

- Noise and Vibration
- Air Quality/Dust
- Loss and/or decreased access to public realm and greenspace within the area
- Longer commute times

#### Noise and Vibration

The construction process is expected to marginally increase noise levels above existing conditions. Varied construction activities are expected to create isolated and short-term noise, and potential vibration impacts on the environment. These have the potential to induce adverse health effects. Health Canada reports that exposure to noise for long durations can contribute and cause such things as:

- Sleep disturbance
- Lack of concentration
- Low tolerance/high annoyance

The effects of the above have been linked to increased fatigue irritability, which have been linked to broader health effects – namely, mental health, cardiovascular effect and in some cases accidents.

#### Air Quality/Dust

The construction process is expected to marginally increase air pollution and dust in the region. Residents with underlying breathing conditions and or heart conditions are more susceptible to experiencing short term health effects from air pollution and/or dust. Health Canada and the Public Health Agency (Health Canada, 2021) report that air pollution can cause and/or contribute to:

Breathing and lung conditions, such as:

- asthma
- allergies
- chronic obstructive pulmonary disease (COPD)

Heart conditions, such as:

- angina
- Arrhythmia
- heart attack
- heart failure
- hypertension

As a result of these impacts, individuals affected by the Project may experience

- Tiredness
- Headache or dizziness
- Coughing and sneezing
- Wheezing or difficulty breathing
- More mucous in the nose or throat
- Dry or irritated eyes, nose, throat and skin

Overall, these are expected to be short term impacts nevertheless, will affect the well-being and health of those living in proximity to the bridge, and regular users of the bridge.

### **Temporary decrease in access to public realm and green space**

The construction stage, including the requirement for staging areas, will result in and contribute to the loss and/or decrease of access to public realm and green spaces within the Project footprint and other areas in close proximity. Such loss, is directly linked to a potential decrease in physical activity amongst residents, such as biking or outdoor sports (e.g., soccer, yoga), which can be attributed to the following:

- Obesity
- Change in energy levels
- Depression
- Cardio-vascular diseases

#### **16.3.1.2 Operation**

Once the construction phase is complete and the bridge is operational it will be considered a public space. The behavior Survey for Safety in Public and Private Spaces (Statistics Canada, 2019) defines *public spaces* as anywhere the public is able to access with little or no restriction (e.g., coffee shops, the street, shopping malls, public transportation, bars and restaurants). In some instances, public spaces can become unsafe spaces, especially if/when any violence or unwanted comments or behaviors are displayed. There are sensitivities towards a historical event which occurred on the bridge in 1989 (see Section 16.1).

It is worth noting that, *“unwelcome comments, actions or advances while in public may cause individuals to withdraw or to not otherwise fully engage in their daily activities or access spaces in which they have the right to freely use and enjoy.”* (Bastomski & Smith, 2017). Additionally, residents of the NCR (and any and all Canadian cities) have the right to live free from violence in general, and Gender-Based violence in particular. Gender-Based violence is defined as violence that is committed against someone based on their gender identity, gender expression or perceived gender. In fact, this kind of violence can have serious long-term physical, economic and emotional consequences for victims, their families, and for society more broadly (WAGE, 2018).

The data below (Statistics Canada, 2019) highlights the percentage of unwanted sexual behavior, unwanted physical contact and unwanted comments in women, men, LGBTQ+ community, and Aboriginal women occurring in public spaces.

- 32% of women 15 years of age or older in Canada, experienced some form of unwanted sexual behavior while they were in a public place in the past 12 months
- For men, 6% of men reported experiencing at least one unwanted physical contact, unwanted comments about their sex or gender, or unwanted sexual attention
- Unwanted behaviors were experienced by the majority of bisexual women (76%), women 15 to 24 years of age (61%), women currently attending school (57%), women who were single and never married (54%), lesbian women (51%), and half of 25-to-34-year-olds (50%)
- Compared to women overall, the prevalence was also higher among women who were First Nations (40%), Métis (40%), had a disability (39%), or who were currently employed (37%)
- Finally, four in ten gay (38%) or bisexual (41%) men experienced one or more types of unwanted sexual behavior in the past 12 months, three times the proportion of heterosexual men (12%)
- Men who were attending school (25%), those who were 15 to 24-years-old (24%), and those who were single (22%) reported a higher prevalence of unwanted sexual behavior than men overall, similar to the findings among women

### 16.3.2 Mitigation and Protective Measures

As mentioned above, the implementation of the Project will have an impact on the air quality of the region, increased noise and vibration, and the loss of public realm and green spaces. To that effect, the IPT is exploring and developing a strategy for mitigating the effects according to the Best Management Practices (BMPs) intended to satisfy safety thresholds by limiting dust, and vibrations as specified in any applicable regulating standards, Health Canada's regulations and by-laws.

Below are some mitigation measures that the IPT will be exploring to address the impacts of the Project on the residents.

#### Noise Vibration

Some of the proposed mitigation measures to minimize the impacts that noise and/or vibration will have on the residents' health include:

- Limiting the speeds of heavy vehicles within and around the site
- Providing compacted smooth surfaces and avoiding abrupt steps and ditches
- Utilizing movable noise barriers and/or temporary enclosures
- Keeping equipment and maintained as per manufacture's recommendation

Mitigation measures will align with best management practices (BMPs), and health Canada's guidance as well as any other applicable regulations and by-law.

## **Air Emissions and Dust**

Some of the proposed mitigation measures to minimize the impacts that air emissions and dust will have on the residents' health include:

- Monitoring wind conditions, and planning operations accordingly
- Minimizing storage of any granular material in heights and/or un-covered on site
- Ensure movable wind breaks are available on site
- Use water spray and suppression techniques to control fugitive dust
- Cover haul trucks and keep access routes to the construction site clean of debris

Mitigation measures will align with best management practices (BMPs), and Environment and Climate Change Canada's guidance as well as any other applicable regulations and by-law.

## **Loss and/or Decreased access to Public Realm and green Space**

It is acknowledged that temporary loss and or decreased access to green space will have an impact on residents' health. The IPT will work with the public and key stakeholders, during public consultations and other engagements, to develop a strategic action plan to address concerns related to the loss of such space. Specific mitigation measures will be made public and/or available as part of the design process.

## **Gender-Based Violence:**

In an effort to discourage any gender-based violence, which can affect victims on an economic, emotional and mental health level, the IPT will explore the following options to ensure the real and perceived safety of individuals crossing or using the bridge:

- Consider incorporating into the bridge design panic buttons and camera surveillance
- Illumination/ lighting of the bridge and surrounding area(s) will follow the principles and guidelines described in the Capital Illumination Plan (NCC, 2017a), particularly to address safety concerns
- Include in the design a segregated pathways/ boardwalk: The functional requirements (see Section 8.3) provide for both a cycling lane and pedestrian boardwalk. The new design will provide enhanced opportunities to support active mobility, providing segregated safe lanes for cyclists, pedestrians, and motorists
- Accessibility: To ensure that active mobility users have access to the bridge and can use it as a safe connection across the river, the Planning and Design Principles for the bridge require that the highest standards of accessibility be met, and that safe and segregated travel lanes be provided for pedestrians and cyclists respectively

In the design stages of the project when more detailed information is known about the project components, a Human Health Risk Assessment (HHRA) will be completed following Health Canada Guidance documents, if required. Specifically, the following guidance documents will be referenced to determine the need for additional assessments:

- Health Canada, 2017. Guidance for evaluating human health impacts in Environmental Assessment: Drinking and recreational water quality.
- Health Canada, 2017. Guidance for evaluation human health impacts in Environmental Assessment: Country foods.
- Health Canada, 2019. Guidance for evaluating human health impacts in environmental assessment: Human health risk assessment.

### 16.3.3 Enhancement Measures

The construction and operation of the new bridge will have a positive impact on the community. This Project will be designed to support active mobility and enhance the bridge's walkability compared to the current structure. Widened and segregated cyclist and pedestrian lanes are expected to promote use of active transportation modes and enhance the overall community's health condition.

In addition, the new bridge will be designed, as per the six Planning and Design Principles, to create a sustainable interprovincial transportation connection that will prioritize active mobility and highlight the symbolic importance of the site to all Canadians for many generations to come. The six planning and design principles are further described in Section 10.3 and available in [Appendix G](#).





## 16.4 Design and Heritage of Structure

### A short history of the Alexandra Bridge

In a time when shipping still reigned supreme, it was not without its drawbacks – most notably, the challenging and unpredictable Canadian winters. As the provinces of Ontario and Québec were developing rail networks of their own, the same waters that served as borders and a crucial shipping link in the early development of Canada now posed a new challenge for industry and nation-building alike. Stimulated by the desire for regional railway linkages as rail became increasingly important, the Alexandra Bridge was initiated as the second rail link across the river (the Prince of Wales Bridge, now William Commanda Bridge, opened in 1880 was the only one until then).

Local support for the new bridge, including a cost-sharing arrangement with the city, led to an altered bridge design consisting of a widened deck to accommodate two electric streetcar tracks, two carriageways and ample pedestrian pathways, in addition to the planned railway. The bridge became the second crossing for people – only the Chaudière Bridge existed at the time to allow people/goods to travel across the river.

While the bridge was upgraded in the 1950s to carry pedestrian and vehicular traffic alongside the existing rail service, the development of a new, suburban train station in 1966 ushered in the end of rail for the Alexandra Bridge. In 1970, as part of the implementation of the Gréber Plan, the Canadian Pacific Railway ceased rail service on the bridge and the rails were removed. The Alexandra Bridge, about 70 years after becoming the first interprovincial rail bridge, was fully modernized for the age of the automobile and the expectations for the 21st century. Over 50 years after the last conversion of the bridge, the conversation has once again shifted to the future of the bridge and its role as a national symbol and vital piece of infrastructure.

### Heritage significance

The Alexandra Bridge is a unique and nationally significant engineering structure, a heritage and historical landmark, and a key element of some of the Capital's most iconic views. The bridge is an important example of a significant engineering work conceived by Canadian interests, designed by Canadian engineers and built by Canadian companies at a time when American and British expertise was dominant. It represents a major innovative engineering achievement for the era in which it was built, using leading-edge technology including all steel construction and the use of a through truss cantilever system with the deck carried mid-truss through the anchor and cantilever spans. It was the fourth largest span in the world in 1900.

The Alexandra Bridge has been designated as a National Historic Civil Engineering Site by the Canadian Society for Civil Engineering. The plaque mounted on the bridge reads as follows:

*Constructed using the most advanced technology available at the time, the Alexandra Bridge stands today as evidence of the outstanding ingenuity and foresight of Canadian engineers. G.Dunn Chief Railway Engineer, H.J. Beemer General Contractor, C.H. Deans Contractor Piers, Start of construction, February 1898, Inauguration March 1901, Commemoration, June 1995.*

## Bridge design

The setting for the bridge was a challenge from the outset, as construction was hampered by ice conditions, and the riverbed offered an unusual, unstable surface of saturated sawdust and other by-products of the lumbering industry to a depth of up to 60ft. (18.3m). The choice of a cantilever design for this location was in part to reduce the number of piers that would be exposed to extreme ice conditions, particularly in the deepest part of the channel, and to minimize the challenges associated with the construction conditions. Other factors influencing the choice of structural system were the government requirement for a clearance of 45ft (13.71m) above the average water line, and the restrictions on the grade imposed by the railway (Sherwood, 1901).

A specific innovation associated with the Alexandra Bridge that was also employed previously on the Forth Rail Bridge in Scotland (today a UNESCO World Heritage Site), is the placement of the deck “mid truss” within the structure. By this it is meant that the deck sits neither at the top nor at bottom of the truss. Rather the deck traverses the truss at a point above the lower chords. This placement effectively lifts the deck off of the piers and allows for greater clearance below the deck and suspended truss for the passage of large vessels. It also reduces the overall height of the bridge and requires less massive piers while maintaining the required clearance (Sherwood, 1901).

The bridge has a PSPC Rated “Level II” heritage rating (National Historic Importance) as it was deemed an outstanding example of the work of the Dominion Bridge Company, an internationally significant Canadian company that was responsible for the design and/or construction of some of the most important works of engineering in Canada from the 1880s through the 20th century.

As such, careful consideration must be given to the documentation and recording of the existing bridge, the preservation and enhancement of current views to and from the bridge, as well as to the use of materials (such as local stone in piers, steel in the structure) that take inspiration from and/or reuse of materials from the structure.

## The cultural landscape context

In addition to its design and aesthetic values, the Alexandra Bridge also forms part of a broader cultural landscape that includes the Parliamentary Precinct, numerous national cultural institutions, the Rideau Canal Locks (part of a UNESCO designated World Heritage Site and a National Historic Site of Canada: Rideau Canal WHS and NHSC) and the Ottawa River itself (which has been designated a Canadian Heritage River).

The Heritage Value Assessment Report (URS, 2010) identifies the following significant views from the bridge:

- The ascending ramp of the boardwalk along the bridge, just east of Laurier Street in Hull
- The high point of the ramp of the bridge’s boardwalk, where a pedestrian obtains the first panoramic view of the Parliament Buildings and other national symbols
- Approximately mid-point on the bridge
- The viewing platform at the bridge’s south end

The bridge has become integrated as an important part of the waterfront and river panorama and has had a powerful impact on the character of the city skyline. The bridge is highly visible from the Portage and Macdonald Cartier Bridges, the Rideau Canal, Jacques-Cartier Park, the Canadian Museum of History, Parliament Hill, the Supreme Court of Canada, Kiwēkī Point (formerly named Nepean Point) and from along the Ottawa River. It also graces the cover of the NCC's Plan for Canada's Capital (NCC, 2017b). For both residents and visitors alike, the Alexandra Bridge has become a much-appreciated landmark and amenity from which to enjoy exemplary views from its wide promenade, including the entrance valley of the Rideau Canal World Heritage Site, the Parliament Buildings/Parliament Hill, the Supreme Court, the Chaudière District, and the Canadian Museum of History.

### 16.4.1 Potential Impacts

Potential impacts and the mitigation measures discussed in this section are those anticipated from the project as defined to date. Comments received from initial public consultation outreach are used to inform next steps. Additional potential impacts will be identified as planning and design for the new structure progresses. These will be addressed as they are documented to ensure that the project remains responsive to changes.

The enhancement measures described in the following section are drawn from the Planning and Design Principles (Appendix G).

#### 16.4.1.1 Deconstruction and Construction

##### Heritage

Based on initial public consultation, commemoration of the Alexandra bridge's history and built heritage were an important consideration. A strong message was received that the project represents a "loss of heritage" that will be felt in the Capital and beyond for this nationally significant bridge. A widely shared concern about the project involved the broader implications and risks tied to the bridge's role as a landmark and destination, as well as the loss of the unique character and heritage of the bridge and loss of scenic views.

The Project's implications for the bridge's-built heritage and history loomed especially large in the feedback provided by participants. Its loss was the most widely shared concern among respondents to the online questionnaire (identified by 64% of respondents), and a majority (50%) consider its commemoration to be very important.

As some respondents expressed throughout the survey, the Alexandra Bridge is, in their eyes, a national treasure and an iconic landmark whose replacement would constitute a significant loss. This was articulated both in terms of the bridge's intrinsic historical value, and the way it shapes the appearance and experience of the space it occupies.

Some respondents consistently expressed their opposition to the decision to replace the bridge and advocated instead for its restoration. A number of respondents were surprised by the decision to replace rather than rehabilitate the bridge and questioned the basis on which this decision had been made.

Respondents noted the important role that the Alexandra Bridge plays by providing beautiful views of important national landmarks, and by itself contributing to the beauty and patrimonial character of the area. Concern about the loss of these views and of the effects of replacement on the integrity of the surrounding landscape was widely shared by respondents.

History and heritage were also among the elements participants most frequently suggested that the new bridge's design should evoke, along with the surrounding landscape, sustainability, and design excellence.

## Views

Key observation points have been identified by the NCC along Confederation Boulevard, where exceptional views of the federal heritage buildings and cultural landscape of Parliament Hill can be experienced. Of these, five observation points could be affected by the project. These are the views from the approach to the Gatineau side bridge to the center of the bridge, as well as the views from the lookout near the approach to the Ottawa side.

A new bridge may impact the view protection strategy as identified in the document Visual Protection of the National Symbols in the National Capital Region, by changing the documented viewpoints and thus risking a change in the underlying premise of the view protection model. This is a very negative and serious impact that must be avoided.

### 16.4.1.2 Operation

Design features and alignment alternatives are important considerations to ensure that the new bridge reflects the history of the site and commemorates the Alexandra Bridge. The choice of alignment will also impact the quality of views from different points.

## 16.4.2 Mitigation and Protective Measures

### Heritage

Based on initial consultation outreach, a number of respondents thought that the design of the bridge should reflect the different histories that overlay the land on which it will be built within that region (309 mentions), of Indigenous Peoples (210 mentions), and of Canada (28 mentions).

Other suggestions in this vein focused instead on the bonds that have shaped collective histories, including the relationship between Quebec and Ontario (68 mentions) and the ties that contribute to unity at a national level (26 mentions). For many respondents, there is no better way to highlight local history and heritage than by having the new bridge emulate the Alexandra Bridge's design (368 mentions).

As part of the project, the IPT will document and record all elements of the existing bridge, preserve and enhance existing views to and from the bridge, and will use materials (such as local stone in piers, steel in the structure) that take inspiration from and/or reuse materials from the existing structure. Where deemed appropriate (and possible) interpretive panels and other items that preserve the memory,

significance of the bridge as well as the heritage of surrounding areas, will be incorporated. The IPT will collaborate with museums to explore the possibility of a museum exhibit about the bridge.

Other ideas brought forward by participants in outreach opportunities included the reuse of material as part of the new bridge, which the IPT intends to explore. Opportunities to retain existing materials and incorporate them into the design of the new bridge is an idea also being assessed. The broader use of such material will also be explored, where possible.

Heritage subject matter experts (SMEs) form part of the IPT and will provide advice and guidance on best practices/measures to respect and preserve the heritage value of the bridge. A Heritage Impact Analysis (HIA) is planned to help inform the conservation decision-making process by assessing the value of the Alexandra Bridge within its broader cultural landscape setting, and providing a comprehensive understanding of the heritage value and character-defining elements unique to the structure and its cultural landscape setting.

Guidance on the management of the heritage resource will be drawn mainly from the *Standards and Guidelines for the Conservation of Historic Places in Canada (GoC, 2021)*. Work has begun with the Royal Architectural Institute of Canada to establish a peer review panel, which will be engaged to provide independent advice to enable an appropriate response to the requirements for the preservation of heritage elements in the new build. The heritage elements are not limited to physical elements, but can also include:

- people such as the original designer/builder or prominent figures at the time of construction
- place including the actual design or
- story of how it contributed to Canada or the local economy and culture.

The HIA is anticipated to provide the following:

- Identification and analysis of the heritage impacts for the replacement with a new alternative signature bridge
- An analysis and articulation of the Heritage Values and Character Defining Elements, including:
  - the existing Alexandra Bridge, from a local/community, National Capital Region, and national and international perspective
  - how the cultural resources within the study area contribute to the unique character of the cultural landscape within which the bridge sits
- Proposed approaches to ensure that these values and elements are protected with any future intervention, including, among others:
  - material retention/reuse
  - design considerations, (including alignment considerations)
  - interpretation/commemoration opportunities, etc.

The HIA will endeavour to highlight additional specific considerations for this cultural landscape in providing a comprehensive analysis and corresponding recommendations, reflecting the full narrative of this iconic setting. An objective list of screening criteria, specific to the context and location of the bridge, will serve to evaluate alternative options and will include important considerations, such as: functional, economic, construction, maintenance and operations, environment, aesthetics, urban

design, social and cultural significance, etc. The bridge's long service life and history of repair works is to be captured in the review and analysis of background documentation.

## Views

Contemplated changes in the alignment and the height of the bridge must consider the protection of the viewpoints as much as possible.

### 16.4.3 Enhancement Measures

The design of the new Bridge must preserve the visual integrity and symbolic importance of national treasures by protecting views to the Canadian Parliament and Parliament Hill. Existing views will be preserved and enhanced.

The visual integrity of cultural landscapes will be preserved by a harmonious integration of the new bridge with the urban and natural environment. This integration requires an appropriate mesh to the urban fabric, its scale and materiality, and underscoring the importance of the Indigenous community in this place.

The design of the new bridge will be geared towards preserving and celebrating the history of the current Alexandra Bridge, which was recognized worldwide for its innovative design at the beginning of the last century. This commemoration will be done, both by the design of an exceptional world-class new bridge, as well as by its architectural form. The bridge will also allow the installation of interpretive elements along the pedestrian route.

Building on and continuing the legacy of our national icons, the bridge will work both as foreground and a background, a sculpture and a setting to the experience of the nation's capital. Guiding Principle 4, Preserve Views and Celebrating the Legacy, of the Planning and Design Principles provide further guidance to the concepts that will be used in the development of the new bridge.

**The relationship between the bridge and its existing urban and natural environment context has been shaped by its place within the history of the capital landscape and the iconic bridge has emerged with a compatible and cohesive presentation unique to its setting.**

- Bridge designers should review heritage reports completed for Alexandra Bridge to understand the character-defining elements of the existing bridge and their collective contribution to the cultural landscape to ensure forthcoming designs do not introduce incompatible features to the setting in terms of size, scale or design.
- The visual integrity of the cultural landscape shall be preserved with a seamless integration of the new bridge into the existing and evolving urban and natural environment context.

**The new design, that will replace the existing steel structure, must build on its legacy and important historical context through a state-of-the-art world-class architectural and structural bridge design that is both a statement of the present time and reflective of the past.**

- The potential to reuse stones and other materials salvaged from the existing structure’s deconstruction to create walls, staircases, benches, interpretive elements or to create a memory wall are encouraged to build on the memory and distinctiveness of the place.
- Opportunities to pay tribute to the surrounding heritage could be expressed in aspects such as materials, form, spatial organization, and interpretation offering visitors a rich experience aimed at expanding their understanding of the region’s evolution.

There is also an opportunity to develop a legacy public history initiative in the form of a book and/or online publication, to assemble, commemorate and celebrate the history of the Alexandra Bridge:

- The project could highlight why the bridge was built, its innovative design, the challenges in its construction, etc.
- Such an initiative could build upon innovative approaches that have been compiled from elsewhere, such as the Tacoma Narrows Bridges in Seattle (<https://www.wsdot.wa.gov/TNBhistory/Connections/entry.htm>). It could include a digital (web-based) component, as well as a published book.
- It could also solicit public inputs, such as memories, photos or artworks germane to the story. This would engage the public who had expressed their concerns about the bridge as an important heritage resource.

## 16.5 Archaeological Potential

The Alexandra Bridge is located within lands identified as ancestral territory of the Algonquin Nation, with the Ottawa region considered traditional territory. Long before French explorer Samuel de Champlain arrived in the area that is now known as Ottawa in the early 1600s, the region was inhabited by Indigenous Peoples. These Peoples were the region’s first residents, often teaching skills to early newcomers such as how to navigate the mighty Ottawa River, survive the region’s harsh winters and how to harvest the natural and seasonal food sources.

The Algonquin Nation has stewarded the Ottawa River Valley for thousands of years. The river is a defining feature of the Algonquin Nation territory and was historically fundamental for trading between nations. It is also considered a meeting and gathering place, with important sacred sites located within a short distance of the bridge.

Archaeologists have found pre-contact Indigenous campsites in this area dating as far back as 8,500 years, but the ancestors of the present-day Algonquin Nation have been here much longer. Strategically located at the confluence of the Ottawa, Rideau and Gatineau rivers, the region lies at the heart of a vast pre-contact communications and trade network spanning northeastern North America. Beginning about 6,000 years ago, goods, raw materials and ideas flowed into the region over long distances for 5 millennia, with indigenous communities from geographically widespread areas continuing to frequent the region well after the arrival of European settlers.

Although a considerable amount of information has been recovered from archaeological sites, our knowledge of the long history of occupation of the Ottawa Valley by Indigenous Peoples prior to the arrival of Europeans remains incomplete. Permanent settlement of the Capital region by Euro-Canadians

began with the arrival in 1800 of Philemon Wright and his pioneers, who founded Wright's Ville on the Quebec side of the Chaudière Falls.

A major transportation route for the fur trade, missionaries and explorers during the 17<sup>th</sup> and 18<sup>th</sup> centuries, the Ottawa River also served as a principal artery for the 19<sup>th</sup> century lumber industry, fostering the construction of numerous sawmills, pulp-and-paper mills and later hydro-electric and other industrial developments with numerous docks and wharves extending into the river to support the enterprises that lined its shores in the Capital region.

The NCC's pre-contact archaeological potential map (refer to Figure 16-8) indicates that this site is situated in an area ranging from medium to high potential for pre-contact archaeological resources. In Gatineau, the registered pre-contact site closest to the study area is the BiFw-23 site, located near the Maison Charron, in Jacques-Cartier Park South, about 250 metres north of the bridge (refer to Figure 16-8). BiFw-23 is part of a complex of 18 pre-contact sites extending north to the mouth of the Gatineau River. A pre-contact ossuary is also known to have been located on the southern edge of the Canadian Museum of History grounds, roughly 325 metres south of the bridge, on an ancient portage trail around the Chaudière Falls. It is thus likely that the land crossed by the Gatineau section of the Alexandra Bridge was repeatedly occupied during that pre-contact period, but any evidence of those occupations would have been destroyed by the long history of industrial development in the area, including the construction of the bridge. An archaeological salvage excavation carried out in 1983 on the site of the Canadian Museum of Man (now the Canadian Museum of History) revealed the foundations of buildings associated with the early lumber and later pulp industries (cf., *Archéologie des sites du Musée de l'Homme et de la Galerie nationale, Les recherches Arkhis, 1984, MCH Archives, Ms. 2455*). The subsequent construction of the museum, the Hull Marina and its parking lot would have severely disturbed or destroyed any historical archaeological resources of heritage value remaining on this parcel of land.

The City of Ottawa archaeological potential map shows the land around the Ottawa approach to the Alexandra Bridge as having archaeological potential, without distinguishing pre-contact from historical potential.

The NCC's analysis of past land use and occupancy of this area does not, however, support this interpretation. The NCC's pre-contact archaeological potential map shows this area as having a low potential for pre-contact archaeological resources. As well, *The History of Major's Hill Park and Nepean Point* (Manuscript Report No. 101, 1975), mentions that the Ottawa Improvement Commission's conversion of Kiweki Point (formerly named Nepean Point) into a park between 1909 and 1912 involved grading and sodding the entire area. This work probably removed all pre-contact archaeological resources and almost all evidence of 19th century use of the point. The exception is the basement and four heating boilers of the Government Printing Bureau building, unearthed in 1983 by an archaeological salvage excavation of the proposed site of the National Gallery of Canada (see MCH Archives, Ms. 2455 cited above). Features, structures and pathways dating to the first half of the 20th century would also have been severely damaged or destroyed by later work on the Point, such as landscaping around the Champlain monument and the construction of the Astrolabe Theatre. These features included an oriental fountain constructed in Osaka, Japan. Erected in the park in 1909, this fountain was dismantled and stored in 1925, reinstated sometime afterwards and removed again in 1961. The NCC's 2017 archaeological recommendations for the *Nepean Point Revitalization Project* consist of monitoring



excavation work and landscaping around the second location of the fountain (its original location was destroyed by the construction of the National Gallery of Canada) and documentation of a lookout, latrine and associated stairs on the escarpment. However, monitoring of Project excavation work at the fountain's former location in 2021 revealed that this structure had been completely removed, thereby eliminating this area from further archaeological concern. No other locations of potential historical archaeological interest are identified on Kîweki Point (formerly named Nepean Point).

The City of Ottawa archaeological potential map suggests that remnants of historical shoreline structures as well as other archaeological remains may be present on the riverbed in the vicinity of the Alexandra bridge and Entrance Bay, leading to the Rideau Canal locks. The NCC supports this suggestion and considers the riverbed in the Gatineau portion of the study area to have similar archaeological potential. The submerged concrete piers of the bridge are also considered to be of archaeological interest.

To lay the piers directly on bedrock, special techniques were required to remove the refuse from the mills deposited on the riverbed. These deposits consisted mainly of sawdust, mixed with wood slabs and logs, and measured from 8 to 20 feet in thickness. An underwater archaeological survey of the inshore riverbed adjacent to the bridge's approaches and around its submerged concrete piers should be carried out prior to the initiation of the Project construction work.

The archaeological potential information will be validated as part of the Indigenous Community engagement process.

Although the NCC's pre-contact archaeological potential map shows the land around the Québec and Ontario ends of the Alexandra Bridge as having a low potential for pre-contact archaeological resources, several places of potential and known historical archaeological importance are located near the Ottawa approach to the bridge. These include:

- Steam ferry landing on the north shore of Entrance Bay. Ferry service between Bédard's Landing (now the site of the Canadian Museum of History), which began in the early 1820s and continued into the early 20th century. The location remained in use until at least the mid-1960s, with various structures being built along the shoreline over time.
- Lieutenant-Colonel John By's Estate. This estate included By's residence, separate quarters for his servants, a stable, latrines and several other outbuildings. Built in 1826, the house was occupied by Major Bolton after By's return to England in 1832 and was the home of Captain Ford when it burnt in 1848. In 1972 and 1973, the NCC and Parks Canada excavated the house ruins and a nearby midden, recovering 95,000 artifacts. The collection, though catalogued and well curated, has not been analyzed and no report of the excavations has ever been produced. The collection and original fieldnotes and drawings are currently housed at the NCC. Brief test pitting carried out by the NCC in 2016 indicate that the remains of the servants' quarters and the stable still exist.
- Artificial pond. A stone-lined pond was constructed over a natural spring in a ravine in the northeastern part of the park in 1876. The portion of the ravine in which the pond was built

appears to have undergone little prior disturbance during the 19th century. Disturbance has been minor following the pond's infilling in 1945 and generally limited to the fill layer (e.g., installation of the sprinkler system). The edge of the former pond may, then, be surrounded by intact natural soils. The section of the ravine extending to the northwest from the pond has undergone considerable disturbance since the first quarter of the 19th century.

Should these or other locations of historical importance be threatened by work related to the Project, appropriate measures for the mitigation of the adverse effects of this work on these resources will need to be put in place.

In some cases, archaeological salvage excavations to recover artifacts may be necessary. Areas along the shoreline within Jacques-Cartier Park, shown in the Figure 14-2 are within the flood zone of the river and are owned by the Province of Québec. The bed of the river is owned by both the Provinces of Québec and Ontario. Should artifacts be threatened by construction activities on these lands, regulatory application for permits from the Ontario Ministry of Tourism, Culture and Sport (MTCS) under the *Cultural Heritage Law, Archaeological Research Regulation* or the Ministry of Culture and Communications (Quebec) (MCC) under the *Cultural Heritage Act* will be required. For archaeological resources within the river, the IPT will work with Parks Canada and both provinces to collaborate on recovery initiatives.

### Archaeological Map



Figure 16-8: High potential for pre-contact archeological map

## 16.5.1 Potential Impacts

### 16.5.1.1 Deconstruction and Construction

Aside from the BiFw-23 site, the remainder of Jacques-Cartier Park South, including the Hull Marina, and the adjoining grounds of the Canadian Museum of History have a low potential for pre-contact and historical archaeological resources. No further archaeological investigation or monitoring of Project work in this area is recommended.

In the unlikely event that bridge replacement work extends onto Kiwèkì Point (formerly named Nepean Point), the NCC's recommendations for the *Nepean Point Revitalization Project* will, if necessary, be implemented. As monitoring of excavation work around the former location of the oriental fountain has already been carried out, the remaining recommendations comprise documenting the lookout and associated structures on the escarpment. This activity will be carried out by a professional archaeologist.

The location of the former artificial pond retains medium potential for pre-contact and historical archaeological resources. It is recommended that any excavation work in this area related to the Project be monitored by a professional archaeologist.

Lieutenant-Colonel John By's Estate is considered to have national, regional and local heritage value. To protect this site from the potential impacts of the Project, no excavation work or other activities related to the Project that may cause soil disturbance will be permitted within the limits of the site.

The shoreline of Entrance Bay bordering Major's Hill Park retains medium potential for historical archaeological resources, in spite of extensive landscaping in this area over the years. It is thus recommended that any excavation work or other activities, such as the installation of moorings, in this area related to the Project be monitored by a professional archaeologist.

The northernmost portion of Major's Hill Park has a low potential for pre-contact and historical archaeological resources. No further archaeological investigation or monitoring of Project work in this area is recommended.

The inshore portions of the Ottawa Riverbed on the Quebec and Ontario sides of the Alexandra Bridge are evaluated as having historical archaeological potential. An underwater archaeological survey of the riverbed within 30 to 50 metres of the shoreline on Entrance Bay, Kiwèkì Point (formerly named Nepean Point) and the northern end of the Canadian Museum of History grounds is therefore recommended. The submerged concrete piers of the bridge are also considered to be of historical interest and will be included in this survey.

As the Project becomes better defined, the IPT will continue to work with Indigenous communities to determine potential impacts on archeological resources and develop suitable recovery strategies.

### 16.5.1.2 Operation

Once commissioned, operation of the bridge is not anticipated to have ongoing impacts to archaeological resources. The shoreline component may undergo active erosion particularly after significant flooding events. Annual monitoring by the NCC's Assessment and Rescue of Archaeological

Legacy (ARAL) Project may be required. Any reinstatement and shoreline erosion measures proposed should be coordinated closely with ARAL rescue activities.

### 16.5.2 Mitigation and Protective Measures

In accordance with federal, provincial and municipal regulatory requirements, mitigation and follow-up program measures to minimize the effects on archaeological resources may include:

#### **Protect and showcase archaeological artifacts and resources.**

- Develop a strategy that places priority on managing sites that are prone to erosion and may contain archaeological resources
- Conduct research to more accurately determine the extent of known archaeological sites
- Manage known archaeological sites in collaboration with the Algonquin people and in accordance with the Protocol for the Co-management of Archaeological Resources (2017) and the Parks Canada's Cultural Resource Management Policy (2013)
- Recognize and promote the educational value of archaeology and heritage

To protect the BiFw-23 site and zone of high pre-contact archaeological potential in Jacques-Cartier Park South from the impacts of the Project, no construction work or other activities, such as staging areas and fence installation, related to the Project that may cause soil disturbance will be permitted within the area outlined in the Figure 16-8. Access to the shoreline of this area for the purposes of the Project will also be prohibited.

The immediate surroundings of the Alexandra Bridge share the rich and unique history of the Capital Region's core sector. The preparation of an overview detailing the prehistory, historical developments and the past archaeological investigations undertaken within those surroundings is another recommendation to be taken into consideration. A document of this nature would be a fitting contribution to the legacy of the Alexandra Bridge.

### 16.5.3 Enhancement Measures

Future bridge construction activities must protect the rich archaeological resources of the river and shoreline, with archaeological sites to be managed in collaboration with the Algonquin Nation and in accordance with the Protocol for the Co-management of Archaeological Resources, (2017) and Parks Canada's Cultural Resource Management Policy (Parks Canada, 2017).

An underwater archaeological survey of the riverbed within 30 to 50 metres of the two shorelines, along with a survey of the submerged concrete piers of the bridge, is recommended.

A detailed archaeological study will be undertaken to identify all known archaeological resources and areas of pre-contact and historical archaeological potential to be avoided by Project work as well as to determine remediation measures (e.g., rescue excavation and monitoring) for zones of archaeological sensitivity that cannot be avoided. The IPT will work with interested Indigenous communities to provide opportunities for meaningful engagement and establish processes for Indigenous communities to have representatives present during archaeological resource recovery programs.

The Planning and Design Principles provide further guidance to the concepts that will be used in the development of the new bridge.

**The new design, that will replace the existing steel structure, must build on its legacy and important historical context through a state-of-the-art world-class architectural and structural bridge design that is both a statement of the present time and reflective of the past.**

- Future bridge construction activities must protect the rich archaeological resources of the river and shoreline, with archaeological sites to be managed in collaboration with the Algonquin Nation and in accordance with the Protocol for the Co-management of Archaeological Resources (2017) and Parks Canada's Cultural Resource Management Policy. (Parks Canada, 2017).
- An underwater archaeological survey of the riverbed within 30 to 50 metres of the two shorelines, along with a survey of the submerged concrete piers of the bridge, is recommended.
- A detailed archaeological study will be undertaken to identify all known archaeological resources and areas of pre-contact and historical archaeological potential to be avoided by project work as well as to determine remediation measures (e.g., rescue excavation and monitoring) for zones of archaeological sensitivity that cannot be avoided.

## 16.6 Navigation and Waterway Activities

In addition to its historical importance, the Ottawa River portion from Lake Timiskaming to East Hawkesbury was designated as a Canadian Heritage River in 2016 for its cultural heritage values. Boaters can reach Kingston via the Rideau Canal and Rideau River waterways which provide opportunities to enjoy unique heritage sites, discover the beauty of the cultural landscape and the charm of the locks while travelling through various small municipalities south of Ottawa. Boaters can also continue down the Ottawa River to reach Montreal.

As discussed in Section 16.5, for thousands of years, the Ottawa River Valley has been a meeting and gathering place as well as a trading route for the Algonquin Nation. There are many important sacred sites located within a short distance of the bridge, contributing to the Ottawa River continued significant cultural importance today. The IPT is sensitive to the potential impacts on Indigenous rights from the Project as a result of alterations to the riverbed, effects on the water quality and quantity as well as modifications to the shoreline. As the Project progresses through the planning and design stages, Indigenous communities will continue to be engaged to ensure that knowledge and information needed contribute to avoidance of impacts, if possible, or determination of acceptable approaches to mitigate them.

As a navigable waterway, a minimum clearance for a navigation channel is required with dimensions of 90 metres x 11 metres clearance from the river. Past study reviews of normal Ottawa River water levels, 100-year flood levels and predicted river level increases due to climate change have indicated that an elevation of 57.2 metres is required to ensure clearance over the river at the location of the navigation channel. The deepest channel is closest to the Ottawa shoreline under the suspended span of the bridge as shown in the Figure 10-1. The level for minimal clearance elsewhere is 46.2 metres.

## Conceptual bridge alignment

The two alternative bridge alignments presented in Section 10.2.1, curved and straight designs, show that the conceptual bridge could potentially have three piers within the channel of the river compared to the current bridge. This will be confirmed as the design becomes further defined. The principal distinction between the two concepts is that the piers in the curved alignment would be in a different location compared to the straight alignment which uses the same alignment as the current bridge.

## Commercial and recreational users

The river shuttles and Aqua-Taxi act as an alternative mode of transportation between the shores of Ottawa and Gatineau. Figure 16-9 illustrates the waterway and the route of the river shuttle between the Canadian Museum of History, Jacques-Cartier Park and the locks.

In addition, boat trips are offered on the Ottawa River to discover and appreciate the capital's landscape from a different perspective. Tours normally depart at the bottom of the locks as well as from Hull Marina in Jacques-Cartier Park.

There are also several launch ramps and marinas that provide access to the river for diverse recreation activities including fishing and other aquatic activities.

### Navigation Channels



Figure 16-9: Navigation channels along the Ottawa River

## 16.6.1 Potential Impacts

### 16.6.1.1 Deconstruction and Construction

Planning for the deconstruction and construction activities will take into consideration the need to maintain navigation opportunities. An adequate access route under the bridge will be provided for vessels that could be reasonably expected to navigate in the area.

Because of the complexity of the Project and the potential for a portion of the work to be completed from barges, heavy traffic along the river during the work to move materials and workers could occur. Short-term restrictions or closures have the possibility to temporarily disrupt commercial, tourism and recreational boating. Since the area around the bridge will be a construction zone, work in the water will require restrictions to public access for health and safety reasons which will limit recreational boating, fishing and other aquatic activities in the area.

A navigation management plan will be developed if required based on the construction approach and methods. Proposed temporary interruptions and closures will be well coordinated in advance with the various stakeholders involved including considerations such as:

- During the high season, navigation could be interrupted and accommodated with night closures on any day from 10 pm to 5 am
- During the off-season, temporary closures to navigation could be required and accommodated with weekend closures from Friday 10 pm to Monday 5 am

Commercial, tourist and recreational activities are anticipated to be affected during the construction process by the following activities:

- Site mobilization and construction of temporary facilities including selection of mobilization and laydown areas which will restrict access to the wharf in Jacques-Cartier Park
- Traffic and navigation maintenance, installation of signage
- Relocation and protection of public utility infrastructures
- Land clearing and soil stripping
- Construction of infrastructure
- Work in aquatic environments (during and post construction)
- Deconstruction of existing bridge
- Transportation, operation, and maintenance of machinery (during and post construction)

The wharf, boat launch and marina in Jacques-Cartier Park are within a space that could form part of the practical work area to support construction activities (see Section 11.6.1 for additional information). Public access to these facilities may not be possible due to public safety concerns. The NCC has agreements with tenants for those facilities which support local tourism businesses. These businesses may be impacted by construction activities. Engagement with affected stakeholders will be key to understanding potential impacts to existing commitments and businesses that are dependent on the Park's facilities to reconcile challenges and limitations and minimize potential impacts. Stakeholder engagement will also seek to determine alternative temporary or permanent relocation options for important infrastructure such as the wharf, boat launch, marina and parking areas to support continued operations during the construction period to inform the Project.

The Project may also impact the traditional travel routes of Indigenous communities and their use of waterways. Information will be sought from each of Indigenous communities to understand the potential impacts and seek acceptable mitigation strategies.

#### **16.6.1.2 Operation**

Following construction, impacts to navigation are anticipated to be similar to conditions that currently exist. The new design is expected to have taken into consideration navigation requirements to minimize the number of piers, and to locate them to maintain the minimum required clearance for a navigation channel. Current piers will also be deconstructed to a depth that will minimize the potential hazard to navigation outside the primary channel.

### **16.6.2 Mitigation and Protective Measures**

Documentation of the sizes and types of vessels stationed in the Ottawa area and/or likely to come into the area may be undertaken during the planning stages. In part, current ship traffic on the river will help to identify the fleet that uses the river and ensure that clearance requirements are considered during all stages of the Project.

If short-term interruptions to navigation are expected during any stage of the Project (deconstruction or construction), information will be provided regarding the length of time anticipated and how vessels will be informed or notified.

Mitigation measures will be implemented during the Project, in particular:

- When possible, keep a channel open for recreational boating, provide one or more marked channels to ensure safe passage and have the required notices to users of marinas and other anchoring facilities
- Communications with marinas in the vicinity of the work
- Issue notices to boaters regarding temporary and permanent obstructions
- Deconstruction of the piers of the present bridge will be completed to a depth required to ensure that the navigation channel is not obstructed and address potential hazards across the river
- Signage will be required during the Project to advise mariners of changes to navigation

### **16.6.3 Enhancement Measures**

A website and a telephone line will be available to provide information and record complaints from users. Any adjustments required as work progresses will be published.

Transport Canada's Navigation Protection Program will enforce conditions attached to authorizations under the *Canadian Navigable Waters Act*. Worksite visits could be carried out to ensure compliance with temporary mitigation measures and, if necessary, adjustments will be required to ensure the safety of recreational boating and commercial navigation.

During deconstruction of the existing bridge, bathymetric surveys could be required to ensure that the remains of the piers do not cause obstacles to navigation.



Guiding Principle 1, Mobility and Continuity of the Urban Fabric, of the Planning and Design Principles also provide direction for the conceptual design of the new bridge.

**The Bridge designs must accommodate vertical profiles that meet the minimum navigation channel requirements.**

- Special consideration must be given to the existing topographical changes and differences between the Ottawa and Gatineau shorelines. The layout of the bridge must consider the unique characteristics of the topography, riverbed, and geological conditions of the site.
- The new bridge design must allow for the navigability of the river to be maintained, comparable to current standards. A navigation channel of 90 metres (horizontal) by 11 metres (vertical), measured from the high-water mark, must be provided.

The NCC's Ottawa River North Shore Parklands Plan (NCC, 2018b) describes a site concept where the waterfront experience will be enhanced by nautical activities and the creation of spaces where users can come in contact with the Ottawa River and enjoy its natural features. This Plan describes a vision where the current business operating at the wharf and marina are engaged with the NCC in developing new facilities and services that support the creation of a port of call to receive recreational boaters from outside the region and offer recreational services and activities that are compatible with river boat-tour operations.



## Part E: Federal, Provincial, Territorial, and Municipal Involvement and Effects

### 17 FEDERAL FINANCIAL SUPPORT

This Project is being entirely funded via internal financing from Public Services and Procurement Canada.

Government policy direction for a holistic strategy to address repairs, replacement and operations for all five crossings in the NCR was provided to PSPC and the NCC in December 2018. The replacement of the Alexandra Bridge is a component of this holistic strategy and funding was provided to PSPC in Budget 2019 to plan and implement this Project.

### 18 REGULATORY REQUIREMENTS

If and when applicable, all permits, licenses, approvals and monitoring requirements under environmental laws and planning and heritage will be reviewed, confirmed and obtained prior to the construction of the Project. An outline of key federal, provincial and municipal legislation and regulations that are anticipated to apply to the proposed Project are outlined below.

The Project is following federal Impact Assessment requirements (and related federal requirements) and applicable requirements for Ontario and Québec, as described in the tables below. Under the *National Capital Act*, the Project is also following the requirements under the Federal Land Use, Design and Transaction Approvals (FLUDTA) as a Level 3 Project.

#### 18.1 Federal

The *Impact Assessment Act* (IAA) applies to Projects described in the Physical Activities Regulations, or as designated by the Minister. Section 48(a) of the *Physical Activities Regulations* includes the construction, operation, decommissioning and abandonment of a new international or interprovincial bridge or tunnel. Accordingly, this Detailed Project Description (DPD) is being submitted to fulfill the requirements for a designated Project to enable the Impact Assessment Agency of Canada (IAAC) to make a determination under the IAA.

Based on the information provided in this DPD, the Agency must decide whether an impact assessment of this designated project is required. Among the factors the Agency must consider in making its decision, the IAA lists the following:

- the possibility that the carrying out of the designated project may cause adverse effects within federal jurisdiction or adverse direct or incidental effects
- any adverse impact that the designated project may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the Constitution Act, 1982
- any comments received within the time period specified by the Agency from the public and from any jurisdiction or Indigenous group that is consulted under section 12
- any other factor that the Agency considers relevant.

In addition to the determination under the IAA process, an Approval pursuant to the *National Capital Act* (s.12) following the Federal Land Use, Design and Transaction Approval (FLUDTA) process is required for the Project to proceed.

The Proponent's Guide to the Federal Land Use, Design and Transaction Approval Process (FLUDTA) (NCC, 2021d), provides information on the role of the NCC. The approval responsibilities of the NCC are fundamental to its mandate as the federal planning and coordinating agency within the National Capital Region.

The FLUDTA approval process has the following objectives:

- to coordinate land use, development and other works on federal lands in order to reinforce and positively contribute to the unique character, identity and quality of the Capital “in accordance with its national significance”
- to ensure that federal properties and buildings are effectively planned and developed to standards and criteria appropriate to their location and context in the Capital
- to implement federal legislation and NCC approved plans, and other environmental and heritage policies.

Level 3 Projects are subject to a comprehensive land use planning and design review, with input from the NCC's ACPDR and ACUA, as part of the federal approval process. Key milestones are outlined in Sections 1.1 and 13 in relationship to this Project's schedule. In summary, due to its complexity, this Project will require approvals at various stages of design development. As a minimum, federal approval will be required at the concept design stage (approximately 15% design development), reference design stage (approximately 33% design development), preliminary design stage (approximately 66% design development), detailed design stage (approximately 99% design development), and final construction/deconstruction stage (construction plans). In the federal approvals framework, the “construction” period refers to the undertaking of works as approved in the federal approval letter. The term construction, and associated conditions, would also apply to the deconstruction and any other approved “works” per the National Capital Act (s.12).

The Planning and Design Principles ([Appendix G](#)), outlined in Section 10.3, provide a cohesive vision, and the guidelines for the replacement of the bridge including its integration with the surrounding transportation network and public spaces. The six principles described in this document are based on the project mission statement “To create a sustainable interprovincial transportation connection that will prioritize active mobility and highlight the symbolic importance of the site to all Canadians for many generations to come.” The Planning and Design Principles will guide the design development of the replacement bridge and are based on Federal plans, policies and studies prepared for the areas in and around Alexandra Bridge and Confederation Boulevard, as well as other NCC design guidelines for monuments and sites within the Capital Region.

The Performance Criteria for Bridge Design ([Appendix G](#)), provide transparency and predictability of NCC's expectations for a successful Federal Approval. The performance criteria summarize the NCC's Capital Interests that apply to the Project, consistent with their mandate, plans, policies, guidelines and the Alexandra Bridge Planning and Design Principles approved by the NCC Board of Directors in June 2021. It is expected that the Proponent will undertake public, stakeholder and Indigenous engagement

and demonstrate that input from these parties and project partners was considered in the design of the new bridge.

After the federal approval letter has been issued, the monitoring period begins. During this period NCC staff will follow up on the implementation of the approval conditions. This process may include project audit and site visits. NCC staff will communicate with the proponent prior to any site visit and the implementation of any corrective measures that may apply. The NCC review and approval process is complete at substantial completion of project. A signed notification will be submitted to the NCC indicating that the project has reached substantial completion and that all the conditions of the federal approval have been met.

The NCC federal approval includes standard conditions, as well as project-specific conditions. The standard conditions related to the environment and monitoring of conditions require that the Proponent satisfy the requirements of all other regulatory authorities and comply with all applicable laws and regulations related to the design and construction of their proposal. Further, the conditions make the Proponent responsible for demonstrating compliance with the approval conditions, including providing requested documentation in a timely manner to the satisfaction of the NCC's regulatory team.

In the case of non-compliance, the NCC federal approval manager will notify the Proponent of areas of non-compliance and work with them to resolve the issues and bring the project and its execution into compliance. If the project is not brought into compliance, the following avenues may be pursued:

- Corrective construction measure identified and recommended to proponent
- Amendment to the federal approval, if the deviation from the original approval is deemed overall beneficial
- Revocation of the federal approval, and block on considering any further applications for federal approval for the subject site, until the project is brought into compliance.



Key federal permits and approvals potentially required for the Project are listed in Table 18-1.

**Table 18-1: Federal permits and approvals**

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
<b>Impact Assessment Act</b>	IAAC	Physical Activities Regulations SOR/2019-285	The Project is a designated Project under the <i>IAA</i> . Section 48(a) of the Physical Activities Regulations includes the construction, operation, decommissioning and abandonment of a new international or interprovincial bridge or tunnel. The IAAC will determine if the proposed Project will require an impact assessment under the <i>IAA</i> , after submission of the Initial Project Description and Detailed Project Description.	Planning
<b>Federal Land Use, Design and Transaction Approvals (FLUDTA), National Capital Act</b>	NCC	<i>National Capital Act</i> (R.S.C, 1985, c. N-4), Section 12	<p>Before undertaking any works in the National Capital Region, PSPC, as a federal department and proponent for the Project, must receive approval from the NCC, per section 12 of the National Capital Act. The Alexandra Bridge Project is a level 3 Project under the Federal Land Use, Design and Transaction Approvals (FLUDTA) process. Level 3 Projects are major Projects with high symbolic value for the Capital and typically of higher complexity. Level 3 Projects are typically presented to the Advisory Committee on Planning, Design and Realty for review, and are submitted to the NCC Board of Directors for approval. Level 3 Projects also typically involve significant public, stakeholder consultation and Indigenous engagement, which is considered by the NCC in its review.</p> <p>The Alexandra Bridge replacement project will require approval by the</p>	Pre-Planning, Planning, Detailed Design

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
			NCC's Board of Directors at key stages of the project (refer to Figure 13-1). The 1st approval was provided in June 2021 for the Planning and Design Principles, and the next anticipated approval will be for a Conceptual Design option (still to be developed).	
<b>Fisheries Act Authorizations</b>	DFO	<i>Fisheries Act</i> (R.S.C., 1985, c. F-14) Sections 35(1), 35(2)(b)	Depending on final design plans, and whether Project activities may adversely affect fish or fish habitat, an Authorization under the <i>Fisheries Act</i> may be required. In the event that Project activities will result in the harmful alteration, disruption or destruction of fish habitat, prior Authorization from the DFO will be required.	Planning, Detailed Design
<b>Canadian Navigable Waters Act Authorizations</b>	TC	<i>Canadian Navigable Waters Act</i> (R.S.C., 1985, c. N-22)	This Act applies to work in, on, over, under, through or across any navigable water that is listed on the list of Navigable Waters.  The Project takes place over and in the Ottawa River, which is a listed Navigable Water. A multiple span bridge over a Navigable Water is defined as a Major Works under the Major Works Order: SOR/2019-320.	Planning, Detailed Design
<b>Species at Risk Act (SARA) Permit</b>	ECCC DFO	<i>Species at Risk Act</i> (S.C. 2002, c.29)	If the proposed Project destroys, harms or removes a species at risk (SAR) listed under the SARA (2002), or its habitat on federal lands, a SARA permit is required from ECCC.  If the proposed Project destroys, harms or removes an aquatic SAR listed under the SARA (2002), or its habitat, a SARA permit is required from DFO.	Detailed Design
<b>Migratory Birds Convention Act (S.C. 1994, c.22)</b>	ECCC – Canadian	<i>Migratory Birds Convention</i>	Vegetation clearing or other work (such as removal of bridge structures that are home to nesting birds) that	Detailed Design

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
	Wildlife Service	Act (S.C. 1994, c.22)	may result in the destruction or disturbance of a bird nest must occur outside of the active breeding window (i.e., April 15 to August 15). In the event that vegetation clearing, or other affecting activities must occur during the migratory bird breeding period, a certified avian biologist must complete a nesting survey within 24 hours of commencement of work to document the presence or absence of active nesting habitats. Where active nests are observed, protection in the form of setbacks and activity restrictions would be identified. There is no permitting process under the MBCA (i.e., destruction of nests is not permitted).	

In addition to the above, it is important to note that:

- As the Project design progresses, the IPT will seek advice from internal and external experts, including federal authorities such as ECCC and DFO to confirm proposed mitigation measures related to species at risk and their habitat, fish and fish habitat or water quality matters, as required. Provincial authorities such as MNRF, MECP, MEFCCWP will also be consulted to address potential impacts within their jurisdiction.
- Through the Federal Heritage Buildings Review Office (FHBRO), Parks Canada provides:
  - criteria and a process for evaluating and designating heritage character
  - provides advice and recommendations to other departments
  - maintains a register of federal heritage buildings

Federal built heritage comprises the places, buildings and monuments that have been recognized as having heritage value. Parks Canada establishes national goals to protect federal heritage buildings and national historic sites.

- Parks Canada Agency is the Federal Government expert on the archaeological work that takes place on federal lands and federal lands underwater. As such, Parks may have a role in providing policy advice and joint preparation with the NCC of the Statement of Work for the archaeological consultant. An Archaeological Overview is the first step in identifying potential archaeological resources in the study area and will determine whether an Archaeological Inventory will be required.



- The Project will also account for and comply with the policies, regulations and obligations of federal departments that may exist under other applicable federal legislation, such as the *Accessible Canada Act* (2019).
- Commemoration or interpretive features (e.g., panels, virtual site experiences, etc.) require review and sign off from Canadian Heritage.

## 18.2 Provincial

Since this Project straddles both Quebec and Ontario, both provincial permitting and approvals regimes are applicable, as discussed below.

The Project team will consult and work with all provincial regulators throughout the Project to exchange information such as timelines, required approvals, required consultation, and issues/effects that the regulatory oversight would manage.

### Québec

Based on preliminary design considerations, it is not anticipated that the Project will require a provincial Environmental Assessment (EA). However, divesting of provincial land may be required, which may trigger the need to include specific information required under the provincial process. This will be confirmed upon outreach, and if needed, requirements will be harmonized. For road infrastructure, Part II of the Environmental Quality Act (EQA) states that:

(3) the construction of a road designed for 4 lanes or more or whose planned right of way has a width equal to or greater than 35 m over a minimum length of 1 km situated within an urbanization perimeter indicated in the land use planning and development plan applicable to the territory concerned or to an Indian reserve.

The Project is designed for 2 lanes of vehicular traffic, right of way will be less than 35 m, and the length of the bridge will be less than 1 km therefore, the EQA does not apply.

In addition, for work in wetlands and bodies of water, Part II of the EQA states that:

(1) dredging, clearing, filling, or levelling off work, for any purpose whatsoever, within the 2-year flood line of a river or lake, over a cumulative distance equal to or greater than 500 m or over a cumulative area equal to or greater than 5,000 m<sup>2</sup>, for a same river or lake.

As described in Section 11.5, the initial concept for the Project covers an area of approximately 1,665m and the approximate length of shoreline affected for the abutment of the bridge on the Quebec shoreline is 20m. Therefore, none of the thresholds above trigger the EQA, it is not anticipated that a provincial EA will be required.

Table 18-2 provides a summary of potentially applicable provincial permits/approvals for this Project within the province of Québec that may apply to this Project. As design progresses, this list may be modified accordingly.



**Table 18-2: Québec permits and authorizations**

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
<b>Environment Quality Act Authorizations</b>	MEFCCWP	<i>Environment Quality Act</i> (CQLR c Q-2), Section 20 and 22	<p>On lands other than federal lands, a ministerial authorization under Section 22 of the EQA is required for certain activities. Section 20 states no one may release or allow the release into the environment of a contaminant in a quantity or concentration greater than that determined in accordance with this Act.</p> <p>For federal lands, the Impact Assessment process is considered an equivalent process. The MEFCCWP will be invited to join the subject matter expert group to review and comment on the Impact Assessment.</p>	Detailed Design
<b>Archaeological research permit, Cultural Heritage Act</b>	Ministry of Culture and Communications (Quebec) (MCC)	<i>Cultural Heritage Act</i> (P-9.002) Archaeological Research Regulations (P-9.002, r. 2.1)	<p>Applicable to provincial lands, which in the present study area including shoreline and riverbed. To protect the cultural and archaeological heritage, a permit is necessary before undertaking any archaeological work in the field, anticipated to be required prior to construction commencement.</p> <p>For federal lands, NCC will rely on Parks</p>	Detailed Design / Pre-Construction

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
			Canada's federal archaeological process, replacing the provincial process with an Archaeological Overview and, if deemed necessary, an Archaeological Inventory.	
<b>Act Respecting Threatened or Vulnerable Species Authorizations</b>	MEFCCWP	<p><i>Act respecting threatened or vulnerable species</i> (E-12.01)</p> <p>Regulation respecting threatened or vulnerable wildlife species and their habitats (E-12.01, r. 2)</p> <p>Regulation respecting threatened or vulnerable plant species and their habitats (E-12.01, r. 3)</p> <p>List of plant and wildlife species which are likely to be designated as threatened or vulnerable (E-12.01, r. 5)</p>	An authorization would be required if the Project were to kill, damage, harass or capture designated species or damage or destroy their habitat. In case of work outside federal lands, the contractor must comply with it.	Detailed Design / Pre-Construction
<b>Act Respecting the Conservation and Development of Wildlife Authorization</b>	MEFCCWP	Act respecting the conservation and development of wildlife (C-61.1), Section 128.6.	No person may, in a wildlife habitat, carry on an activity that may alter any biological, physical or chemical component peculiar to the habitat of the animal or fish concerned.	Detailed Design / Pre-Construction

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
			A 'SEG' permit may be required for electrofishing.	
<b>Act Respecting the Lands in the Domain of the State Authorization</b>	MNRFO	<i>Act respecting the lands in the domain of the State</i> (c T-8.1)	This Act applies to all lands that form part of the domain of the State, including the beds of watercourses and lakes. The Minister may gratuitously transfer land or grant a servitude to a local municipality where it is required for the development of roads or public transport	Detailed Design / Pre-Construction

### Ontario

Based on preliminary design considerations, it is not anticipated that the Project will require a provincial EA under the Ontario *Environmental Assessment Act* (EA Act). Since the proponent of this Project is PSPC and the NCC, the bridge replacement would not be considered an undertaking to which the EA Act would apply. The Project team has reached out to the Ontario Environmental Assessment Program to notify them of the Project and confirm the team's understanding of applicable provincial requirements.

It should be noted that the Ontario government has amended the EA Act (July 2020), and with the changes, a "Project List" will be developed through future regulations that would identify Projects subject to the EA Act. At this time, a draft "Proposed Comprehensive Environmental Assessment Project List" has been released for public comment on the Environmental Registry of Ontario (ERO# 019- 2377). While not yet in force, this Project is not a listed Project on the draft Project List and therefore is not anticipated to trigger the need for a comprehensive EA (although any updates should be monitored and application of the Project to the EA Act confirmed with the MECP). It should be noted that the EA Act contains measures to harmonize and align with the *Impact Assessment Act* in an effort to reduce duplication (i.e., with federal approvals) and allow for substitution where both Ontario and federal IA requirements apply (i.e., one harmonized process that requires two decisions). If this Act applies to the Project, efforts to coordinate with the federal process would be encouraged.

Table 18-3 provides a summary of potentially applicable provincial permits/approvals for this Project within the province of Ontario that may apply to this Project. As design progresses, this list may be modified accordingly.

**Table 18-3: Ontario permits and authorizations**

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
<b>Endangered Species Act Registration and/or Overall Benefit Permit</b>	Ministry of the Environment, Conservation and Parks (MECP)	<i>Endangered Species Act</i> , 2007 (S.O. 2007, c.6) Sections 16 to 20 O. Reg. 230/08 O. Reg. 4/12 O. Reg. 242/08	Registration and/or Permit under the <i>Endangered Species Act</i> if the Project affects a species that is listed on the Ontario SAR list and is listed as an extirpated, endangered, or threatened species.	Detailed Design / Pre-Construction
<b>Ontario Water Resources Act Permit to Take Water or (PTTW)</b>	MECP	<i>Ontario Water Resources Act</i> Ontario Regulation 387/04 - Permit to Take Water (PTTW)	The nature and extent of dewatering activities for this Project are not yet known, though temporary dewatering may reasonably be anticipated during construction of bridge piers. It is anticipated that a Permit to Take Water (PTTW) will be required for construction activities but will be confirmed during detailed design.  Where Project construction requires water takings (pumping, draining, dewatering), up to 50,000 L/day require no permit/registration, takings between 50,000 and 400,000 L/day require registration (EASR), takings over 400,000 L/day require a permit (PTTW)	Detailed Design / Pre-Construction
<b>Environmental Protection Act Environmental Compliance Approvals</b>	MECP	<i>Environmental Protection Act</i> (R.S.O., 1990, c.E.19) – Part II, Section 9	Environmental Compliance Approval under the <i>Environmental Protection Act</i> may be required for the	Detailed Design / Pre-Construction

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
<b>(ECA) for Wastewater, Waste, Air, and Noise</b>		O. Reg. 255/11 O. Reg. 419/05	following activities: to facilitate stormwater management and to facilitate temporary on-site sewage and water treatment facilities.	
<b>Environmental Protection Act ECA, Water Treatment,</b>	MECP	<i>Environmental Protection Act</i> (R.S.O., 1990, c.E.19) Part II.1, Section 20.2 Ontario Water Resources Act (R.S.O. 1990, c.O.40) Section 53(1)	If a temporary sedimentation basin is used outside federal land, an ECA for the sanitation works will be required from the MECP to authorize the construction, operation and discharge of the temporary settling basin.	Detailed Design / Pre-Construction
<b>Archaeological clearance under the Ontario Heritage Act (OHA)</b>	Ministry of Tourism, Culture and Sport (MTCS)	<i>Ontario Heritage Act</i> (R.S.O. 1990, c. O.18)	On lands other than federal lands: disturbance of land that possesses archaeological potential requires the prior completion of appropriate archaeological assessments prior to disturbance. This applies in the present study area to the riverbed.  On federal lands, NCC will rely on Parks Canada's federal archaeological process, replacing the provincial process with an Archaeological Overview and, if deemed necessary, an Archaeological Inventory.	Detailed Design / Pre-Construction
<b>Review of Built Heritage and Cultural Landscape under the OHA</b>	MTCS	<i>Ontario Heritage Act</i> (R.S.O. 1990, c. O.18)	In case of work outside federal lands, a Heritage Overview may be required to determine the presence of built	Detailed Design / Pre-Construction

Permit / Act	Agency	Regulation	Project Activities	Stage of the Project
			heritage and cultural landscapes, If identified, a Cultural Heritage Assessment Report is required to determine the effects of the Project on heritage resources and recommend mitigation measures, if necessary.	
<b>Occupy Public Lands</b>	Ministry of Natural Resources and Forestry (MNRF)	<i>Public Lands Act (R.S.O. 1990, c. P.43)</i>	The Province of Ontario owns the bed of the Ottawa River within its jurisdictional boundary. Bridges are prescribed structures under this legislation. An authorization to occupy public lands under section 21.1 of the Act will be needed for piers and other permanent infrastructure located on the bed of the river.	Detailed Design / Pre-Construction

The contractor will be required to abide by all applicable municipal, provincial and federal regulations, including, but not limited to:

- Soils and excavated material disposal to licensed facilities
- All applicable health and safety regulations
- Obtain materials from authorized facilities, such as aggregates from sources duly authorized under the applicable regulations (*Aggregate Resources Act*)
- Respect all applicable municipal by-Laws

### 18.3 Municipal

Given the Project’s footprint, ongoing discussions are occurring with the City of Ottawa and the City of Gatineau.

All applicable Acts, By-laws, Zoning By-laws, licenses, permits and regulations will be adhered to, where applicable.



The IPT will continue to consult and engage with both Cities, Ottawa and Gatineau, including their respective Committees (e.g., Built Heritage Sub-Committee, Planning Committee and other committees as required) throughout the life of the Project. It is recognized that heritage planning is of importance to all levels of government and as such, is a fundamental part of the Project.



## Part F: Potential Effects of the Project

### 19 POTENTIAL IMPACTS ON INDIGENOUS COMMUNITIES

The following potential impacts to Indigenous communities and potential mitigation measures were identified based on:

- Engagement with Indigenous communities and organizations identified in Section 5.3 and work taking place for other projects in the area
- Responses to the comments raised by Indigenous communities to the Initial Project Description submitted to the IAAC.
- Review of literature and other project reports
- Knowledge of relevant federal legislation

The IPT has experience engaging with Indigenous communities for such projects as the LeBreton Flats redevelopment, Kiweki Point (formerly named Nepean Point), Pangishimo Park, Victoria Island, Chaudière Falls, the Energy Services Acquisition Program, increasing public access to the Ottawa River shoreline, and the Timiskaming Dam-Bridge of Quebec Replacement Project. Engaging the communities in these initiatives yielded valuable understanding and a solid foundation upon which to build.

#### 19.1 Initial Assessment of Impacts on Indigenous Communities – Changes in the Environment

The IPT recognizes that the potential impacts, mitigations, and enhancements measures identified to date are preliminary. Continued engagement with Indigenous communities, studies undertaken to inform the design of the bridge, and studies led by interested Indigenous communities and organizations, will identify specific issues that will require exploration of appropriate mitigation strategies and follow-up measures. Based on initial engagement, the IPT noted some potential impacts and mitigations strategies described in Sections 15 and 16 for further discussion with Indigenous communities and organizations.

##### 19.1.1 Biophysical Impacts

###### 19.1.1.1 *Physiography, Geology, and Hydrogeology*

An uncontrolled discharge of water during dewatering could cause localized downstream flooding, erosion or sedimentation. If shallow overburden is encountered, disturbance to overburden during bridge deconstruction or construction may cause soil erosion and slumping during construction that may require rehabilitation, specifically in the steep area adjacent to the river.

Excavation to support deconstruction and construction activities are anticipated. Details will be available as the design stages progress. Flooding, erosion and sediment transport impacts to water quality, wildlife and wildlife habitat or fish and fish habitat and mitigation strategies will be managed through several EPPs such as Accidents and Malfunctions Response Plan, Spill Response Plan, and Erosion and Sediment Control Plan (Section 22).



### 19.1.1.2 Drainage and Surface Water

The construction stage of the Project has the potential to result in bed and bank disturbance/erosion, which may result in potential turbidity spikes, TSS loading and overall sedimentation.

The fluvial geomorphology, flow conveyance and water velocity of the river may be impacted by the removal of the existing bridge piers and design/installation of the new piers, with possible impacts on erosion and sedimentation rates, and on ice jam formation and separation. There is also the potential for a contaminant spill during a large storm event.

Flooding and erosion may affect water quality downstream which could result in adverse impacts to fish and fish habitat. This would have impacts on fishing.

Discharge of contamination in the water could be absorbed by fish, making them unfit for human consumption. This would impact the ability of communities to harvest fish.

To mitigate these potential impacts:

- An Environmental Protection Plan (EPP) will be developed for the Project. The EPP will outline the proposed environmental protection measures and commitments to be carried out by the contractor during construction to avoid or reduce potential effects.
- An Erosion and Sediment Control (ESC) Plan will be developed, implemented and enforced during construction.
- Discharge from dewatering/unwatering activities should be treated and released to the environment at least 30 m from local watercourses or wetlands and allowed to drain through a well-vegetated area.
- Environmental monitoring will be implemented to confirm appropriate mitigation measures are in place, maintained and functioning during the construction stage.
- Implement spill management protocols such as secondary containment of any temporary fuel storage and preparation of a spill response plan made available on the work site.
- Installation and monitoring of turbidity curtains to prevent the release of turbid water.
- Prior to being demolished, the existing concrete piers should be isolated from the stream flow. Pier deconstruction and removal will require the use of cofferdams and/or turbidity curtains to contain the construction waste. Similarly, cofferdams or equivalent will be required when installing the new bridge piers to create a dry work zone for curing the concrete.
- Hydrological assessments are anticipated to be required for the design of the piers for the new bridge to understand the risks for the structure as well as impacts on navigation and sediment transport from potential changes in the water flow and velocity. These assessments will provide guidance in the selection and configuration of coffer dams, if needed in the construction stages, as well as approaches to reduce impacts and provide direction on mitigation needed to isolate the construction areas.
- The potential impacts from release of contaminants on human consumption of fish will be assessed following the Health Canada, 2017 document: Guidance for evaluation human health impacts in Environmental Assessment: Country foods.

As an enhancement measure, the proposed bridge deck will incorporate stormwater management features to direct runoff from the bridge surface to limit the potential contaminants from directly entering the Ottawa River.

Bridge replacement also allows for the creation of improved riverine habitat and shoreline restoration. A thorough assessment of the proposed bridge abutment design should be conducted to enhance the design so that riverbed scour around the abutments is decreased to the extent possible. Considering natural channel design principles and best practices during the design stage of the Project may provide potential to enhance the existing river shoreline and associated aquatic habitat.

### **19.1.1.3 Vegetation**

Potential impacts on vegetation and ecological communities resulting from the deconstruction of the existing bridge and construction of the new bridge include changes to community diversity, species diversity, and introduction or spread of invasive species.

Activities related to construction may result in the removal and degradation of vegetation along the shoreline of the Ottawa River.

Construction activities may encroach on species at risk plants.

Changes to riparian vegetation communities along the shoreline may affect water quality downstream which could result in adverse impacts to fish and fish habitat. This would have impacts on fishing.

To mitigate these potential impacts:

- A pre-construction survey of the development footprint of the Project will be undertaken to confirm the presence or absence of vegetation species at risk. The project will also avoid and protect any species at risk through protection design and construction separation.
- Field surveys will be conducted prior to the initial stages of design to identify the vegetation (including SAR/SOMC) and ecological communities within the PDA and any adjacent impacted lands. Survey methodologies will be developed using recognized survey protocols and in consultation with relevant federal and provincial authorities (ECCC, DFO, MECP, MNRF, C, etc.). The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required. After field surveys are conducted and a list of terrestrial vegetation and SAR/SOMC is identified, species-specific mitigation measures and permit requirements will be confirmed, and a management approach will be developed. The need for and extent of any follow-up program will be confirmed and developed through the design process. If it is determined that SAR/SOMC plants are present and will be impacted, appropriate SAR/SOMC permitting and mitigation plans will be developed for the specific species, including exploring opportunities to transplant individual SAR/SOMC.
- An invasive species management plan will be developed as part of the EPP to mitigate the spread of invasive species.
- Any trees to be removed will be compensated at a minimum ratio of 2:1.

#### **19.1.1.4 Wildlife and Wildlife Habitat: Migratory Birds and Species at Risk**

Bridge deconstruction may disrupt nesting opportunities of some migratory birds or bird species at risk.

The loss of habitat or nesting opportunities for species that can be harvested for food may impact hunting opportunities.

To mitigate these potential impacts:

- Wildlife and wildlife habitat protection and mitigation measures will be included as a component of the EPP to identify specific wildlife protection measures to be implemented during construction.
- Detailed design of the construction area will be reviewed to avoid and reduce impacts on wildlife habitat and vegetated areas to the extent possible.
- Construction activities with the potential to remove migratory bird habitat, such as vegetation clearing, will be avoided to the extent possible during the breeding season. Compensation for removal of SAR habitat may be required.
- Sediment, dust, and erosion controls will be implemented to avoid and reduce impacts on aquatic, semi-aquatic, and riparian bird habitats during deconstruction and construction and practices will be included in the EPP.

#### **19.1.1.5 Fish and Fish Habitat**

During deconstruction, the following potential impacts on fish and fish habitat may happen:

- Equipment operation and deconstruction activities may interfere with existing habitat in the vicinity of the piers.
- Debris generated during deconstruction may enter the water column and rest on the riverbed.
- Construction of new piers may disturb the riverbed and existing habitat.
- Construction may result in bed and bank disturbance/erosion which can result in turbidity spikes, TSS loading and overall sedimentation, all of which can be detrimental to physical habitat structure (e.g., spawning beds) as well as to the physiological processes of fish. Increased sediment loading can cause gill abrasion and may force fish to avoid the area.
- Flooding and erosion may affect water quality downstream which could result in adverse impacts to fish and fish habitat. This would have impacts on fishing.

To mitigate these potential impacts:

- As a mitigation measure, timing windows for in-water works will be determined with approval authorities during the detailed design stage.
- During in-water construction activities, turbidity will be monitored daily to confirm there are no increases as a result of Project construction. A spill prevention and management plan will also be developed for the Project.
- Fish and mussel rescues will be performed from the dammed area prior to complete dewatering, and the use of low impact dam materials such as Aqua-Barrier or Aqua Dam coffer dams.

- A turbidity curtain would be installed around the perimeter of the in-water work zone to further promote isolation of the construction zone, as well as reduce water quality impacts and the downstream migration of silt and sediment from dewatering activities.
- Mitigation measures for the prevention of excessive sedimentation and debris encroachment are similar to those employed to consider water quality impacts.
- A structure that will result in a reduction of the number of supporting piers will decrease the footprint of impact on physical fish habitat and allow for rehabilitation and restoration of fish habitat in areas where piers are removed.

Through the implementation of habitat creation, restoration and other offsetting measures, impacts from this Project on fish and fish habitat to achieve net environmental benefits may be positive over the long-term.

There may be an opportunity for works with environmental benefits to be completed as part of this Project to offset some of the cumulative impacts of urban developments in this region.

## 19.2 Initial Assessment of Impacts on Indigenous Communities - Social, Health and Economic Conditions

Similarly to potential biophysical aspects, potential impacts to social, health and economic conditions of Indigenous communities will be explored through continued engagement. Studies undertaken to inform the design of the bridge, as well as studies led by interested Indigenous communities and organizations, will identify specific issues that will require exploration of appropriate mitigation strategies and follow-up measures.

### 19.2.1 Sites of Historical and Archaeological Significance

The NCC's pre-contact archaeological potential map indicates that the lands immediately around the Alexandra Bridge in both Gatineau and Ottawa have a low potential for pre-contact archaeological resources. There is a pre-contact archaeological site in Jacques-Cartier Park South (BiFw-23) and a pre-contact ossuary on the southern limit of the Canadian Museum of History. It is also known that the shoreline of the Ottawa River between the museum and the mouth of the Gatineau River was densely occupied seasonally from at least 5,000 years ago until about 500 years ago.

A protocol between the NCC, Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation was signed on August 22, 2012 and updated on March 13, 2017. The protocol provides a framework for the engagement of Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation in all stages of archaeological investigations undertaken on NCC land. It ensures that Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation are fully informed of such investigations and fully involved in the decision-making process regarding the co-management of archaeological resources discovered through investigations or construction and development work.

Kitigan Zibi Anishinabeg First Nation agrees in the protocol to inform members of the Algonquin Anishinabeg Nation Tribal Council and other Algonquin Anishinabeg communities in Quebec about activities and issues.

Concerns for potential impacts to culturally sacred sites located in the vicinity of the Project were expressed. The concern for access to several areas will be discussed with Indigenous communities during planning for construction related activities. Detours resulting from the closure of the bridge will consider the need to retain opportunities to access sites identified by Indigenous communities.

The IPT acknowledges that other Indigenous communities may have an interest in the archaeological field work. The IPT will work with interested Indigenous communities to provide opportunities for meaningful engagement.

### 19.2.2 Health Impacts

The comments to date in engagement with Indigenous communities and organizations about health impacts of the Project have been at a high level.

During deconstruction and construction activities, potential adverse effects on fish populations, vegetation (e.g., berries, plants, mushrooms, highbush cranberry, medicinal plants, etc.) and wildlife may result from the release of contaminants into the air or water.

To mitigate these potential impacts:

- In the design stages of the project when more detailed information is known about the project components, a Human Health Risk Assessment (HHRA) will be completed following Health Canada Guidance documents, if required.

### 19.2.3 Economic Impacts

The Indigenous communities engaged to date have indicated a strong interest in potential economic benefits from the planning, construction and operation of the Project, as shown in the summary of records below. Engagement is ongoing and through these discussions the IPT will further discuss Indigenous communities' concerns on social impacts as well as appropriate mitigation measures.

The tools available to the IPT to be able to provide economic benefits to Indigenous people and businesses include:

- promoting and ensuring their participation in increased numbers in contracting, as per the Minister's mandate to ensure that at least 5% of federal contracts are awarded to businesses managed and led by Indigenous Peoples
- funding for community-based economic development strategies to assist people and businesses to increase their skills and capacities
- the human resource capabilities of PSPC and the NCC to hire and train Indigenous people for skilled careers and
- creating comprehensive Indigenous Participation Plans (IPP).

#### 19.2.3.1 Indigenous Participation Plans

The Request for Proposals for the removal of the existing bridge, the design and construction of the replacement bridge and for long-term operations will include a requirement for bidders to submit

Indigenous Participation Plans (IPP) stating how they intend to generate socio-economic benefits for the people and/or business community of targeted Indigenous communities and organizations. The IPPs will address employment, training, skills development, apprenticeship programs, sub-contracting, and equitability.

PSPC, as the contracting authority, will determine a target as a percentage of the total value of the contract for participation of Indigenous workers and businesses.

The IPPs will include a Human Resources Plan detailing how the Contractor or its subcontractor(s) intends to maximize Indigenous employment.

The Human Resources Plan will address how employment of Indigenous people will be managed and will provide details on the work to be carried out for each position proposed to be filled by an Indigenous person. The Plan will also include strategies for the recruitment and retention of Indigenous persons and plans for succession and staff management.

The IPP will also describe how the contractor intends to address the utilization and/or sub-contracting of Indigenous businesses and how the contractor intends to engage the local Indigenous business communities.

The IPP can include a provision for bidders to identify other benefits of value to Indigenous communities, with flexibility for the bidders to put forward innovative ideas.

#### **19.2.3.2 Community-Based Economic Development Plans**

Indigenous communities have stated during engagement meetings (see records below) that IPPs and other targeting approaches will not result in increased economic participation for their members without work being done to:

- Identify the current skills and capacities of community members and businesses
- Compare the current capacity with the opportunities resulting from future bridge work
- Prioritizing the development of skills and capacities for members in areas of potential
- Increase access to training, development and apprenticeships
- Foster relations with private sector industry representatives to promote more understanding between the non-Indigenous business world and Indigenous Peoples
- Promote joint ventures between non-Indigenous and Indigenous businesses
- Identify and eliminate barriers that prevent Indigenous businesses from winning Government of Canada contracts
- Identify and eliminate barriers that prevent Indigenous people from accessing training, obtaining certifications, getting hired, and being successful and respected in their places of work

The IPT will provide funding for Indigenous communities and organizations to create community economic development strategies that address the issues above and other concerns. The funding can include salaries for staff positions within the Indigenous government to manage the strategic work.

The IPT will also support Indigenous communities and organizations as they seek funding, collaboration and other forms of support from other Government of Canada departments and agencies, other levels

of government, training and educational institutes, unions, and contractors to increase the economic participation of their members.

#### **19.2.3.3 Human Resource Capacities of PSPC and the NCC**

PSPC and the NCC will hire and provide training for Indigenous people in all aspects of their work associated with planning and administration of crossings.

### **19.3 Engagement Summary**

The section below summarizes the key concerns and/or interests raised by the following communities and the IPT's response:

- Algonquin Anishinabeg Nation Tribal Council (AANTC)
- Algonquin Nation Secretariat
- Algonquins of Ontario (AOO), including the member communities of:
  - Antoine
  - Bonnechere
  - Greater Golden Lake
  - Kijicho Manito Madaouskarini (Bancroft)
  - Mattawa/North Bay
  - Ottawa
  - Shabot Obaadjiwan (Sharbot Lake)
  - Snimikobi (Ardoch)
  - Whitney and Area
- Algonquins of Pikwakanagan First Nation
- Kebaowek First Nation
- Kitigan Zibi Anishinabeg First Nation
- La Nation Anishinabe du Lac Simon
- La Nation Huronne-Wendat
- Le Conseil de la Première Nation Abitibiwinini
- Le Conseil des Anicinapek de Kitcisakik
- Long Point First Nation
- Métis Nation of Ontario
- The Algonquins of Barrière Lake
- The Mohawk Council of Akwesasne
- The Mohawk Council of Kahnawake
- The Mohawk Council of Kanesatake
- Timiskaming First Nation
- Wahgoshig First Nation
- Wolf Lake First Nation

A full record of all engagement is presented in [Appendix D](#).

### 19.3.1 Summary of Engagement – Algonquin Anishinabeg Nation Tribal Council

The IPT has discussed the Project with the Algonquin Anishinabeg Nation Tribal Council, which requested financial support for engagement. The IPT has provided funds to support development of two positions, one for consultation and one for procurement. The Council has also discussed opportunities for economic participation in the project with the IPT.

### 19.3.2 Summary of Engagement – Algonquin Nation Secretariat

The IPT has made efforts to discuss the project with the Algonquin Nation Secretariat. No issues were identified yet, but the IPT will continue to try to connect with the Secretariat. Funding support for participation will be available as required.

### 19.3.3 Summary of Engagement - Algonquins of Ontario

**Table 19-1: Summary of Engagement - Algonquins of Ontario**

Area of concern or Interest	Integrated Project team’s (IPT) response
<b>Registry Comments</b>	
<p>The Proponent states “to identify potential social, economic, and human health considerations relevant to the Project, a desktop review of available information in the form of reports, maps and publicly available databases has been conducted” (PSPC, 2021a, p. 163).</p> <p>The AOO recognizes desktop research is an important first step to identify and understand baseline socio-economic conditions. However, the AOO are concerned that publicly available information (such as Statistics Canada data) will not provide an accurate baseline of socio-economic conditions for Algonquin communities. Accurate baseline data are critical for the Proponent to conduct a thorough impact assessment of the Project on Algonquin health, socio-economic, and community well-being factors.</p> <p>The AOO requests the Proponent and/or Agency provide funding for the AOO to develop an AOO Health and Socio-Economic Study to collect accurate socio-economic baseline conditions for the impact assessment. Conducting an AOO Health and Socio-Economic Study early in the impact assessment processes will support the AOO to understand existing baseline conditions, identify Valued Components (VCs) to fully assess impacts of the Project on the AOO’s socio-economic and well-being values, conduct a preliminary meaningful socio-economic impact</p>	<p>The IPT looks forward to working with Indigenous communities as part of the engagement process to identify and obtain copies of reports, maps, and documents that hold Indigenous and environmental knowledge including knowledge specific to the communities.</p> <p>The IPT and Algonquins of Ontario have agreed on a multi-year work plan and budget that will support the completion of this study.</p>



<p>assessment, and provide recommendations for an AOO socio-economic management plan. Collaborating early in the impact assessment process to identify and assess Algonquin baseline conditions will enable the Proponent and the Agency to adequately assess impacts of the Project on Algonquin rights and interests.</p>	
<p>In Section 15.1, Social Context, there is no reference made to the AOO or other Indigenous Nations who have historically and continue to both occupy and use the Project site and surrounding area. Given the AOO's concerns about the impact of the Project on access and impacts to the Kichi-Sibi, the AOO are concerned the current geographic scope of the Initial Project Description is not substantive enough to adequately assess impacts to Algonquin access and use of the Kichi-Sibi.</p> <p>The AOO recommends that given the AOO's history in the study area, Section 15.1 should include content about the AOO's historic and current use of the lands and waters in the study area. To address this concern, the AOO request the Proponent update section 15.1 to include:</p> <ul style="list-style-type: none"> <li>• History of the AOO's historic and current use of the lands that may be impacted by the Project</li> <li>• History of the AOO's historic and current use of the Kichi-Sibi that may be impacted by the Project</li> <li>• History of the AOO's historic and current use of the lands and waters for socio-economic and well-being activities that may be impacted by the Project</li> </ul>	<p>The IPT recognizes the historic and continued use of the area by Indigenous communities and looks forward to engage with interested communities to gather knowledge from available reports, maps or any other source materials (that are acceptable to be shared) that may hold Indigenous Knowledge to contribute to the assessment of potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.</p> <p>The IPT anticipates that studies agreed upon in the multi-year work plan and budget will contribute to documenting historical and current uses of the lands impacted by the Project. This study will provide knowledge important to the impact assessment process.</p>
<p>The Proponent states "Potential impacts and the mitigation measures discussed in this section are those anticipated from the Project as defined to date and include the comments received from respondents to public consultation outreach" (PSPC, 2021a, p. 168). However, the potential impacts of the Project on values identified by the AOO have not been highlighted. The AOO are concerned that if the AOO's values are not included in the IPD, these values will not be given due consideration in subsequent phases of the impact assessment process.</p> <p>Based on Algonquin socio-economic values from past impact assessments and technical submissions the AOO request the following values are included in the socio-economic impact assessment:</p>	<p>The IPT notes the socio-economic values described as important components to include in the impact assessment.</p> <p>The IPT anticipates that studies agreed upon in the multi-year work plan and budget will contribute to documenting knowledge important to assess potential impacts on the noted values in the impact assessment process.</p> <p>There will also be other opportunities for the Algonquins of Ontario to participate in studies that could contribute valued information. Additional studies are anticipated to be required to complete the construction planning. The IPT will engage Indigenous communities to contribute Indigenous Knowledge,</p>

<ul style="list-style-type: none"> <li>• Access and travel throughout Algonquin lands and waters</li> <li>• Health and socio-economic conditions, including the state of physical, emotional, mental, and spiritual well-being</li> <li>• Effects on current land and water use</li> <li>• Indigenous economic and business development opportunities</li> </ul>	<p>identify concerns and determine appropriate studies needed, including discussion of the terms of reference for future studies.</p>
<p>In Table 19-3: Economic Impacts – Algonquins of Ontario, in record #109 the AOO identified that the “AOO does not have information about the business capacity of its members” (PSCP, 2021a, p.247). The Proponent responded that “funding from PSCP and the NCC can be used for skills assessments and business inventories in support of economic participation.” The AOO are appreciative of this offer made by Proponent.</p> <p>The AOO look forward to receiving capacity funding to support the development of an Algonquin-specific businesses inventory and skills assessment.</p>	<p>The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support increase of staff complement and opportunities to engage other resources as necessary.</p>
<p>In Table 19-3: Economic Impacts – Algonquins of Ontario, in record #148 the AOO state “an umbrella agreement with PSCP and the NCC should be established, followed by specific agreements for Indigenous Participation Plans for each crossing procurement activity, including the Alexandra Bridge replacement” (PSCP, 2021a, p. 247). The Proponent responding by stating “agreed.”</p> <p>The AOO appreciate the Proponent’s support for pursuing an agreement and look forward to finalizing the tripartite Collaboration Agreement soon.</p>	<p>The IPT looks forward to working with Algonquins of Ontario.</p> <p>The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support increase of staff complement and opportunities to engage other resources as necessary.</p>
<p>The Proponent states that the AOO have raised concerns about the design, construction, and operations of the bridge potentially having negative effects on fish habitat and the movement of species, which will have negative effects on Algonquins who rely on the fishery for their food requirements. The Proponent elaborates that a combination of Indigenous Knowledge and technical studies, including enhanced monitoring by the AOO, will be used to mitigate against negative human health impacts.</p> <p>The Proponent further states that “The IPT’s mitigation and enhancement measures to address these potential impacts are detailed in Section 15.3 of this report” (PSCP, 2021a, p. 238).</p> <p>Despite the Proponent including the AOO’s previously raised concerns in Section 19.1 and stating that the</p>	<p>The IPT is committed to continue to consult with the Indigenous communities and organizations throughout the life of the Project. Indigenous communities will be encouraged to bring up issues and concerns as they are identified.</p> <p>The IPT currently has no information regarding harvest of traditional foods near the bridge but will engage with Indigenous communities to determine the nature and extent of these activities.</p> <p>In the design stages of the project when more detailed information is known about the project components, a Human Health Risk Assessment (HHRA) will be completed following Health Canada Guidance documents, if required. The IPT will work with interested Indigenous communities to understand</p>

<p>details of proposed mitigation and enhancement measures to address these concerns have been provided, Section 15.3 does not include a description of the AOO's previously raised concerns, nor does it provide any proposed mitigation and enhancement measures that specifically address the AOO's concerns.</p> <p>The AOO requests that the Proponent revise Section 15.3 of the Project Description to explicitly include the potential health impacts that have been previously raised by the AOO and provide details on the planned mitigation and enhancement measures that are intended to specifically address the AOO's concerns regarding impacts to human health.</p>	<p>current reliance on fish for food requirements in the Project area and assess the need to conduct the HHRA.</p> <p>Specifically, the following guidance documents will be referenced to guide additional assessments:</p> <ul style="list-style-type: none"> <li>Health Canada, 2017. Guidance for evaluation human health impacts in Environmental Assessment: Country foods.</li> </ul> <p>The IPT anticipates that studies agreed upon in the multi-year work plan and budget will contribute to documenting knowledge important to assess potential impacts on human health from consumption of fish from the Project area to assist in the impact assessment process.</p>
<p>The Proponent states there is a plan to develop and implement an erosion and sediment control (ESC) plan to reduce impacts to water quality and aquatic environments. The AOO must be included in the development and implementation of environmental protection plans to ensure that there are no unanticipated impacts to water quality or the aquatic environment of the Kichi-Sibi and that avoidance and mitigation measures are working successfully.</p> <p>The Proponent must provide capacity funding for the AOO to review key draft impact assessment related plans, reports, studies, etc. to ensure there is effective avoidance and mitigation of impacts to Algonquin Aboriginal rights and interests.</p>	<p>The IPT is committed to understanding the effects of the Project on fish and fish habitat before beginning construction.</p> <p>Further details regarding the design and methods of construction (including the requirements for the contractor's erosion and sediment control plan) will be developed in the design stages of the Project. These details will be shared with Indigenous communities, as they become available, to contribute Indigenous Knowledge, identify concerns and develop appropriate mitigation strategies.</p> <p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p> <p>The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support increase of staff complement and engage other resources as necessary.</p>
<p>The Proponent states that turbidity monitoring will take place during construction with a minimum frequency of twice per day.</p> <p>Loading of total suspended solids (TSS) into the water column for prolonged periods will impact water quality and can cause death to fish. The AOO asserts that this scope of monitoring is insufficient for adequate protection of the aquatic environment.</p> <p>The Proponent must increase the frequency of turbidity monitoring to continuous during</p>	<p>The Project will be reviewed in detail by DFO and is expected to require a <i>Fisheries Act</i> authorization. This will ensure that potential impacts to fish and fish habitat for all construction activities are thoroughly evaluated, and that impacts are reduced and mitigated. If impacts cannot be adequately reduced or mitigated, the IPT will work with DFO and interested Indigenous communities to propose compensation and/or habitat offset measures, as required.</p>



<p>construction. Any increase in TSS resulting from the Project must trigger a halt to construction until the source is identified, contained, and methods are improved before construction resumes.</p> <p>Implementing continuous turbidity monitoring will aid in mitigating potential impacts to water quality and the aquatic environment from TSS and protects Algonquin fisheries and Algonquin Aboriginal rights and interests.</p>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p>
<p>The Proponent lists examples of measures that can be implemented to recover and remediate an accidental release of hazardous substances during deconstruction and construction of the Project adjacent to, or into, a watercourse or waterbody but does not commit to the implementation of any of them specifically.</p> <p>The Proponent must commit to securing a minimum of two of the listed emergency containment structures: “Deploy booms, skimmers, sorbent pads or a functionally equivalent containment structure to contain releases in or near a watercourse or waterbody” (PSPC, 2021a, p. 135).</p> <p>These structures must be onsite and ready for emergency response when/if needed. This method of preparedness is essential to adequately protect the aquatic environment and Algonquin Aboriginal rights and interests from accidental releases of hazardous substances.</p>	<p>Fish and fish habitat surveys will be undertaken within the Project area to provide baseline information required to fully assess the potential impacts of the Project. The results of these surveys will potentially influence the bridge design and methods of construction, which will be developed during the design stages of the Project. This information is in turn required to determine the detailed potential effects of the Project on fish and fish habitat, as well as to develop a management approach to protect this VC and ensure compliance with the Fisheries Act, the Species at Risk Act, and other federal and provincial legislation.</p> <p>The Project will be reviewed in detail by DFO and is expected to require a Fisheries Act authorization and the IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p> <p>The information gathered will be essential for the contractor’s development of the Environmental Protection Plan which will outline potential risks and proposed environmental protection measures and commitments.</p>
<p>The Proponent states there is a plan to further review construction timing windows and execute a site-specific fishery and fish habitat survey for the areas in the Kichi-Sibi potentially affected by the Project. The AOO have long standing knowledge of fish species, populations, and habitat for critical life stages that would be valuable to consider in the development and execution of fish and fish habitat surveys.</p> <p>Currently, the AOO identifies the following species of importance for inclusion in the IPD: Kichi-Sibi Pimisi (American eel), lake sturgeon, lake whitefish, and pickerel/ walleye. Additional species may be added</p>	<p>The IPT notes the initial species identified by the Algonquins of Ontario. This information will contribute to initial work planning.</p> <p>The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed to assess potential impacts and develop mitigation strategies as needed.</p> <p>The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support a five year funding for the Kichi Sibi guardian program,</p>



<p>upon completion of an Algonquin Knowledge and Land Use Study (AKLUS).</p> <p>The Proponent must provide funding to engage the Kichi-Sibi Guardians during both the development and implementation phases of the fish surveys. In addition, construction timing windows must be informed by thermal monitoring of the Kichi-Sibi leading up to proposed construction to ensure no spawning activities are disrupted to avoid impacts or harm to fish.</p> <p>The Kichi-Sibi Guardians must also be involved in monitoring activities for key species of importance to the AOO (e.g., Kichi-Sibi Pimisi (American eel), lake sturgeon, lake whitefish, pickerel/ walleye) to ensure these species do not experience any alteration to their health or populations due to Project activities. The protection of these valued species is essential to avoid impacts to Algonquin Aboriginal rights and interest.</p>	<p>an increase of staff complement and engagement of other resources as necessary to participate in the fish habitat surveys.</p>
<p>The Proponent states that they will engage with the Department of Fisheries and Oceans and provincial authorities regarding the preferred design of new piers. The goal of this engagement is to improve the bridge, limit destruction of fish habitat, and create habitat restoration opportunities at the sites of the old piers. The AOO prefer for habitat restoration to improve habitat, especially for valued fish species such as Kichi-Sibi Pimisi (American eel), lake sturgeon, lake whitefish, and pickerel/ walleye to support Algonquin harvesters and offset the cumulative effects dams and bridges have had on these species along the Kichi-Sibi.</p> <p>Algonquin community members hold knowledge from before the development of the various bridges and dams along the Kichi-Sibi. The Proponent must engage with the AOO regarding the bridge design as well as habitat restoration design plans so that efforts are adequately restorative to original habitat states and not merely superficially remediated. Constructed habitats must align with the vision the AOO have of habitat restoration to successfully support our valued species and protect Algonquin Aboriginal rights and interests.</p>	<p>The IPT will provide opportunities for Indigenous communities to contribute to the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments.</p> <p>The IPT will work with interested Indigenous communities to include their interests and environmental knowledge in the Project. This effort will include ongoing consultation, the participation of Indigenous communities in studies, and discussion of potential mitigation options.</p> <p>Additional studies are anticipated to be required to complete the construction planning. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed.</p> <p>The nature of participation will be determined by the Indigenous communities themselves, including:</p> <ul style="list-style-type: none"> <li>• reviewing draft Terms of References for studies</li> <li>• leading studies with financial support from the IPT and providing the results to the IPT</li> <li>• participating in parallel with the work of external experts hired by the IPT</li> <li>• Reviewing the results of studies undertaken under the direction of the IPT and providing comments and guidance.</li> </ul>



<p>The Proponent commits to conducting field surveys prior to the detailed design stage to identify the presence of fish and fish habitat (including SAR/SOMC) within the PDA but has not yet engaged the AOO in the development of these plans. The AOO and Kichi-Sibi Guardians have long standing knowledge of fish species, populations, and habitat for critical life stages that would be valuable in the development and execution of fish and fish habitat surveys.</p> <p>The Proponent must provide funding to engage the Kichi-Sibi Guardians in the development and implementation of these surveys as they are a valuable resource for identifying habitat, species assemblages, and population trends in the Kichi-Sibi overtime.</p> <p>The Proponent must also provide funding to the AOO to review and comment on the results of the survey report.</p>	<p>The IPT looks forward to working with Algonquins of Ontario and other Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed to assess potential impacts and develop mitigation strategies.</p> <p>The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support an increase in staff complement and opportunities to engage other resources as necessary.</p> <p>The IPT anticipates that studies agreed upon in the multi-year work plan and budget will contribute to documenting knowledge important to assess potential impacts</p>
<p>The Proponent suggests that mitigation measures for water works will respect timing windows for important fish life stages such as spawning, migration, and egg incubation. However, the Proponent does not elaborate or respond to the AOO’s suggestion to use thermal monitoring to establish those avoidance windows and ensure adequate protection of fish populations.</p> <p>The Proponent must commit to the use of water temperature monitoring before beginning construction and/or deconstruction works to adequately avoid impacts to fish spawning and egg incubation. These reproduction activities are essential to the health and longevity of valued species to the AOO and must receive the highest protections to mitigate and avoid impacts to Algonquin Aboriginal rights and interests.</p>	<p>Field studies will be conducted prior to the detailed design stage to identify the presence of fish and fish habitat within the Project area. After field surveys are conducted, species specific mitigation measures and permit requirements will be confirmed.</p> <p>The IPT will engage Algonquins of Ontario and other Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed. The IPT will discuss specifics of study design, including water temperature monitoring, during the development of the studies.</p>
<p>The Proponent states, “there will be temporary impacts associated with the coffer dams, including loss of water cover within the dammed area, drying of the riverbed in the dammed area and some bed disturbance associated with the installation and removal of the dams” (PSPC, 2021a, p. 156). While bathymetric surveys and sediment type characterizations are already included in baseline surveys, the Proponent has not proposed a sediment quality assessment to determine potential effects of sediment disturbance.</p> <p>The AOO are concerned with both TSS on eggs and fish as well as potential contaminants such as mercury in</p>	<p>Field surveys will be conducted prior to the detailed design stage to identify the presence of fish and fish habitat within the Project area.</p> <p>Hydrological assessments are anticipated to be required in the design of the piers for the new bridge to understand the risks for the structure as well as impacts on navigation and sediment transport from potential changes in the water flow and velocity. This assessment will provide guidance in the selection and configuration of coffer dams, if needed in the construction stages, as well as approaches to reduce impacts and provide direction on mitigation needed to isolate the construction areas.</p>

<p>the sediments being re-mobilized into the environment. If this were to occur, this would create significant impacts to fish and benthic organisms and ultimately Algonquin community members.</p> <p>The Proponent must commit to sediment quality assessment at the Project site before project activities commence or before the cofferdam is installed. If this assessment occurs too late, there are increased risks that sediment disturbance on the aquatic habitat will occur, which may impact the health of Algonquin community members if contaminants are taken up by fish species and subsequently eaten by Algonquin community members.</p>	<p>The Project will be reviewed in detail by DFO and is expected to require a <i>Fisheries Act</i> authorization. This Act and authorizations under it will ensure all potential impacts to fish and fish habitat for all construction activities are thoroughly evaluated, and that impacts are reduced and mitigated. If impacts cannot be adequately reduced or mitigated, we will work with DFO and our interested communities to propose compensation and/or habitat offset measures, as required.</p> <p>The IPT will engage Algonquins of Ontario and other Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed. Aquatic and semi-aquatic habitat characterisation will be completed as part of the fish habitat surveys.</p>
<p>The Proponent states “A typical condition of a Fisheries Act authorization is the requirement for post-construction monitoring over a period of up to three years, or for another period of duration to be discussed with DFO. Typical monitoring components include examining the construction zone and downstream environments for stability, habitat restoration success and function as per the intent of the design” (PSPC, 2021a, p. 157).</p> <p>The Proponent has not engaged with the AOO in the development of such plans to ensure they align with the values and standards of the AOO.</p> <p>The Proponent must provide capacity funding to support the AOO to participate in the review and implementation of the monitoring plans for monitoring stability and habitat restoration function. This would be in addition to the Proponent’s commitment to make funding available to the Kichi-Sibi Guardians to support the physical in-field monitoring efforts. These efforts will ensure constructed habitats align with the objectives the AOO have for habitat restoration and support the health and abundance of valued species that Algonquin community members harvest.</p>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.</p> <p>Once further information is known on impacts, and if required, the IPT will be proposing a monitoring plan to monitor the effectiveness of mitigation measures and ensure that there is no long-term harm to fish (and other aquatic species) throughout the Project area. The IPT will work with Algonquins of Ontario and other Indigenous communities to define the scope of the post-construction monitoring.</p> <p>The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support a five year funding for the Kichi Sibi guardian program, an increase of staff complement and engagement of other resources as necessary to participate in the fish habitat surveys.</p>
<p>The Proponent states “Based on this preliminary assessment, residual impacts to fish and fish habitat, potentially including aquatic SAR, as a result of construction activities are likely to occur following the implementation of mitigation measures,” (PSPC, 2021a, p. 157) and that “Impacts are expected to be reversible following the implementation of habitat</p>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.</p>



<p>restoration and enhancement measures” (PSPC, 2021a, p. 157).</p> <p>The AOO are concerned the Proponent is appraising restoration work as an equal offset to fish and fish habitat impacts when a restoration plan has not yet been developed or reviewed for adequacy.</p> <p>The Proponent must provide capacity funding and engage the AOO in the development and implementation designs for habitat offsetting. This would include capacity for the AOO to review and comment on restoration and enhancement activities to ensure these activities align with Algonquin restoration objectives and are adequately protective of Algonquin rights and interests.</p>	<p>The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support an increase of staff complement and opportunities to engage other resources as necessary to participate in the development and implementation of designs for fisheries mitigation, restoration and enhancement efforts as part of the project.</p>
<p>The Proponent states that “After completion of pier construction, areas affected by construction that can be rehabilitated will be restored. PSPC will consider enhancing fish habitat taking into account advice and recommendations from partners, DFO, and experts. Through the implementation of habitat creation, restoration, and other offsetting measures, impacts from this Project on fish and fish habitat to achieve net environmental benefits may be positive over the long-term” (PSPC, 2021a, p. 245).</p> <p>The AOO are concerned with the lack of commitment by the Proponent to achieve net-positive environmental impacts to the Kichi-Sibi ecosystem. Any works in and around the Kichi-Sibi must achieve net-positive effects to support the river and reclaim ecological integrity after the cumulative effects of bridges, dams, and industrial pressure that has been forcibly placed on the Kichi-Sibi.</p> <p>The Proponent must commit to achieving net positive environmental benefits through fish habitat enhancement and restoration activities.</p> <p>In addition, the Proponent must provide capacity funding to:</p> <ul style="list-style-type: none"> <li>engage the AOO in the development and implementation designs for fish habitat enhancement and restoration activities</li> <li>support the AOO’s review and comment on such plans to ensure they align with Algonquin restoration goals and objectives</li> </ul>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.</p> <p>After completion of pier construction, areas affected by construction that can be rehabilitated will be restored. PSPC will consider enhancing fish habitat taking into account advice and recommendations from Indigenous communities, DFO, and experts.</p> <p>Through the implementation of habitat creation, restoration and other offsetting measures, impacts from this Project on fish and fish habitat to achieve net environmental benefits may be positive over the long-term.</p> <p>DFO’s Policy for applying measures to offset adverse effects on fish and fish habitat under the Fisheries Act states that “The concepts of “avoid, mitigate and offset” build a hierarchy that is internationally recognized as a best practice in reducing risks to biodiversity. This hierarchy of measures emphasizes that efforts should be made to first prevent (avoid) the occurrence of harmful impacts. When avoidance is not possible, then efforts should be made to minimize (mitigate) the extent of the death of fish and harmful impacts on fish habitat caused by the proposed work, undertaking, or activity in question. Any residual harmful impacts should then be addressed by offsetting; offsetting measures typically counterbalance this loss through positive contributions to the aquatic ecosystem.”</p>





What We Heard Through Consultation	
AOO is interested in economic development opportunities as crucial for long-term sustainability.	An Indigenous Participation Plan will be created in partnership with AOO addressing its interest in long-term sustainability.
AOO does not have information about the business capacity of its members.	Funding from PSPC and the NCC can be used for skills assessments and business inventories in support of economic participation.
An umbrella agreement with PSPC and the NCC should be established, followed by specific agreements for Indigenous Participation Plans for each crossing procurement activity, including the Alexandra Bridge replacement.	Agreed. The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support increase of staff complement and opportunities to engage other resources as necessary.
Submission by AOO of revised work plans and budgets for the Alexandra Bridge replacement impact assessment, and for a Long-Term Relationship Agreement concerning the National Capital Region crossings program of work.	The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support increase of staff complement and opportunities to engage other resources as necessary.
AOO described a budget need to support the planning and coordination of economic development opportunities.	AOO was encouraged to include a staff position in its budget to deal with economic opportunities and Indigenous Participation Plans. The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support increase of staff complement and opportunities to engage other resources as necessary.
Construction activities could damage spawning grounds and fish habitat in the vicinity of the bridge, harming fish populations throughout the Ottawa River watershed.	<p>The bridge will be designed and constructed to not impede or restrict the movement of aquatic species in the area.</p> <p>Through the implementation of habitat creation, restoration and other offsetting measures, impacts from this Project on fish and fish habitat to achieve net environmental benefits may be positive over the long-term.</p> <p>Given the nature and scope of this Project, it is probable that as a result of construction activities, there will be some damage to spawning grounds and fish habitat in the vicinity of the bridge, along with aquatic species, in the area.</p> <p>The Project will be reviewed in detail by DFO and is expected to require a Fisheries Act authorization. This Act and authorizations under it will ensure all potential impacts to fish and fish habitat for all construction activities are thoroughly evaluated, and that impacts are reduced and mitigated. If impacts cannot be adequately reduced or mitigated, we will work with DFO and interested Indigenous communities to propose compensation and/or habitat offset measures, as required. Other mitigation</p>



	measures are described in <b>Section 15.2.3 Aquatic Environment</b> .
Need for fish habitat restoration and monitoring after completion of construction.	<p>The effectiveness of mitigation measures will be monitored to ensure that there is no long-term harm to fish and other aquatic species.</p> <p>Areas affected by construction that can be rehabilitated will be restored.</p> <p>Habitat creation, restoration and other offsetting measures will be considered to achieve positive net environmental benefits over the long-term.</p> <p>Once further information is known on impacts, and if required, the IPT will be proposing a monitoring plan to monitor the effectiveness of mitigation measures and ensure that there is no long-term harm to fish (and other aquatic species) in the Project area.</p> <p>After completion of pier construction, areas affected by construction that can be rehabilitated will be restored. PSPC will consider enhancing fish habitat taking into account advice and recommendations from Indigenous communities, DFO, and experts.</p> <p>Through the implementation of habitat creation, restoration and other offsetting measures, impacts from this Project on fish and fish habitat to achieve net environmental benefits may be positive over the long-term.</p>
Need for financial support for AOO engagement activities and environmental monitoring.	The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support an to increase of staff complement and opportunities to engage other resources as necessary.
The Algonquins of Ontario indicated that the design, construction and operations of the bridge may have negative effects on fish habitat and the movement of species, which will have negative effects on community members who rely on the fishery for their food requirements. The work plan developed by the AOO will use Indigenous Knowledge and technical studies, including enhanced monitoring activities by AOO members, to mitigate against negative effects on the health of their members.	<p>The IPT will work with interested Indigenous communities to understand current reliance on fish for food requirements in the Project area and assess the need to conduct the HHRA.</p> <p>Specifically, the following guidance documents will be referenced to guide additional assessments:</p> <ul style="list-style-type: none"> <li>• Health Canada, 2017. Guidance for evaluation human health impacts in Environmental Assessment: Country foods.</li> </ul> <p>The IPT anticipates that studies agreed upon in the multi-year work plan and budget will contribute to documenting knowledge important to assess potential impacts on human health from consumption of fish from the Project area to assist in the impact assessment process..</p>
Need for funding to support the Kichi-Sibi Guardians Contract to assist with baseline, construction, post-	The IPT and the Algonquins of Ontario have agreed on a multi-year work plan and budget that will support an



construction and follow-up monitoring activities for the Project.	to increase of staff complement and opportunities to engage other resources as necessary.
The design of the replacement bridge could impede the movement of aquatic species throughout the Ottawa River watershed.	<p>The bridge design will consider the impacts to fish and fish habitat. A reduction in the number of supporting piers will decrease the footprint of impact on physical fish habitat in the river.</p> <p>The bridge will be designed to not, at any point, impede or restrict the movement of aquatic species in the area, (such as a dam might). Construction methods to be used will not impede movement of species, neither will the design and long-term operations.</p> <p>The Project will be reviewed in detail by the Department of Fisheries and Oceans (DFO) and is expected to require a Fisheries Act authorization. This Act and authorizations under it will ensure all potential impacts to fish and fish habitat activities are thoroughly evaluated, and that any impacts will then be reduced and mitigated.</p>

### 19.3.4 Summary of Engagement – Algonquins of Pikwakanagan First Nation

**Table 19-2: Summary of Engagement – Algonquins of Pikwakanagan First Nation**

Area of Concern or Interest	Integrated Project Team’s (IPT) response
<b>Registry Comments</b>	
<p>The IPT used the term “Indigenous Partners” throughout the IPD.</p> <p>AOPFN requests in future all reference to Indigenous Partners be removed in future documents and be replaced with “Affected Indigenous Nations” – while participating in the impact assessment AOPFN has not provided Free, Prior, and Informed Consent to the Project and should not be considered a “Partner”</p>	<p>The IPT will use terminology aligned with the Impact Assessment Agency of Canada and will refer to Indigenous communities.</p>
<p>The IPT provides a general overview of the project’s development stage as well as a timeline of bridge design and construction process steps in Table 1-1.</p> <p>It is also mentioned that “the IPT has commenced required studies/assessments and other planning activities”. and provides what appears to be a comprehensive list of studies, assessments, and planning activities specific to this project, and their scheduling.</p> <p>AOPFN appreciates the recent meetings with PSPC to review timelines and details regarding proposed studies with AOPFN. AOPFN recommends that the IPT</p>	<p>There are multiple regulatory processes as well as planning and design aspects of this Project progressing simultaneously. The IPT has initiated engagement with Indigenous communities to determine if they wish to participate in this Project, in the impact assessment process for the Project, and in the studies that inform the Impact assessment process. The IPT is committed to continue this engagement with the Indigenous communities for the duration of the Project.</p> <p>Additional commitments are found in <b>Section 5.7 Engagement Plans to Completion of the Project</b>. The IPT is committed to continue to engage with</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>provide a written statement in the IPD confirming the commitment to continue engagement with Indigenous communities (including AOPFN) on studies to inform the assessment.</p>	<p>Indigenous communities and organizations according to the pace and scope of engagement that they desire.</p> <p>Table 5-2 summarizes the Project's proposed engagement activities for each phase of the impact assessment process and into operation of the new bridge. Commitments in the Pre-Planning and Planning phases include engagement of Indigenous communities and organizations to carry out studies and address issues, as well as exploring mitigation measures and enhancements.</p>
<p>AOPFN is concerned that Indigenous Participation in Bridge alignment and alternative means assessment is not explicitly included as part of future engagement activities. AOPFN Algonquin Knowledge must inform the development of criteria and weighting for the selection process for bridge alignment.</p> <p>AOPFN requires participation in the alignment selection process and alternatives assessment in collaboration with the Proponent.</p>	<p>The IPT has added details to <b>Section 10 Potential Alternatives</b> on the rationale for the replacement of the current bridge. A full discussion of the environmental, social and economic factors considered is also provided.</p> <p>The IPT will work with Indigenous communities to collect and validate Indigenous Knowledge to inform the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments.</p>
<p>PSPC mentions that land and river infrastructure improvements may be necessary or desirable, including ecosystem enhancements. AOPFN needs to be involved in future land and river infrastructure improvements.</p> <p>AOPFN needs to be part of the identification of any land and river infrastructure improvements including:</p> <ul style="list-style-type: none"> <li>• identifying potential improvements, e.g., riverine travel improvement; creation of lost or under-represented features, e.g., rapids or eddy pools; fish habitat retention or creation; edible/medicinal plantings; wildlife habitat features</li> <li>• Workshop(s) with AOPFN and PSPC representatives to plan and design the improvements</li> <li>• Identify necessary study and assessment needs to design improvement(s), develop study plans, and assign roles and responsibilities.</li> </ul>	<p>The IPT will work with Indigenous communities to plan the scope of studies to gather information on the biophysical characteristics of the river to be conducted as part of the Project. Indigenous communities will have opportunities to contribute to the identification, planning and design of potential land and river infrastructure improvements as well as studies required to support their development.</p>
<p>PSPC states one vision of Confederation Boulevard is "to create a memorable image ... reflective of Canadian values, heritage..."</p>	<p>The IPT acknowledges Algonquins of Pikwakanagan First Nation interest in the design of Confederation Boulevard. Except for the bridge itself, this project will</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>AOPFN recommends that PSPC commit to working with AOPFN to identify AOPFN history and values that may be able to be captured in the design of Confederation Boulevard. Any preliminary design elements and features that can be shared should be provided to AOPFN and should be presented in the DPD.</p>	<p>not include any changes to the Boulevard. Future changes to Confederation Boulevard are out of scope for this Project and will involve a separate Indigenous engagement process.</p> <p>The IPT will work with Indigenous communities to collect and validate information on physical and cultural heritage and values to contribute to the design of the new bridge and achievement of the vision of creating a bridge reflective of Canadian values and identity.</p>
<p>The draft IPD notes that, "Based on the cost estimates developed, indefinite maintenance of the existing structure was determined to be more costly over the next 75 years" (p. 70).</p> <p>It is not clear if the costs for repair outweigh any cultural or environmental impacts or if this will be further investigated in future.</p> <p>Please provide further information to AOPFN on next steps for "Alternatives to" assessment and "Alternative means" assessment to AOPFN and within the IPD acknowledge a commitment to engage with Indigenous communities on Alternatives assessment.</p>	<p>The IPT has added information to <b>Section 10 Potential Alternatives</b> on the rationale for the replacement of the current bridge. In brief, the bridge has already experienced significant deterioration that will accelerate over time. Deteriorating steel combined with the need to replace the existing east and west side cantilever decks and other capital expenditures mean that replacement is warranted as the most cost-effective alternative, given the bridge's advanced age. A full discussion of the environmental, social and economic factors considered is provided in the revised section.</p> <p>The IPT will provide opportunities for Indigenous communities to contribute to the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments.</p>
<p>The IPD states, "An important aspect under review is how to deconstruct the existing bridge and rebuild a new one. Design, engineering, environmental, social, and economic impacts will affect the selection of the approach" (p.72).</p> <p>AOPFN is concerned that cultural impacts were not included in this statement.</p> <p>Revise wording to recognize potential impacts to AOPFN and other indigenous communities Culture. Recommendations provided in AOPFN comment above apply in this circumstance as well.</p>	<p>In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments.</p>
<p>Section 14 of the IPD does not adequately recognize the cumulative context in describing the current conditions of the biophysical environment.</p>	<p>Additional discussions will be needed to understand the cumulative effects of concern. When more details are available at the bridge design stage, residual impacts on Valued Components (VCs) that may</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>Cumulative effects in the Ottawa River are a serious concern to AOPFN that must be a key focus of this impact assessment.</p>	<p>contribute incrementally to existing cumulative effects will be confirmed and evaluated.</p>
<p>Of the numerous reports used to inform the potential environmental impacts of The Project (<a href="#">Appendix F</a>, referenced here), only 1 document is based in Indigenous Knowledge.</p> <p>PSPC must provide additional details in this section regarding how Indigenous Knowledge has or will be integrated into the description of the environment and potential impacts. In particular, a more thorough investigation to locate reports, maps, and documents that hold Indigenous and AOPFN environmental knowledge (that are permissible to be shared), must be included in the desktop review of potential environmental impacts. AOPFN looks forward to participation in the planned desktop review.</p> <p>It should be noted that reports uncovered from desktop review may not contain or include AOPFN-specific Algonquin knowledge. AOPFN looks forward to collaborating on the desktop review. The proponent must also ensure that AOPFN is engaged and consulted with respect to the Nation's specific Algonquin knowledge in consideration of the Project impacts in addition to the proposed desktop review.</p>	<p>The IPT looks forward to working with Indigenous communities as part of the engagement process to identify and obtain copies of reports, maps, and documents that hold Indigenous environmental knowledge including knowledge specific to Algonquins of Pikwakanagan First Nation.</p> <p>The introduction to <b>Section 15 Biophysical Environment and Potential Impacts</b> will state:</p> <p>To identify potential environmental considerations relevant to the Project, a desktop review of available information in the form of reports, maps and publicly available databases has been conducted (refer to <a href="#">Appendix F</a>). An update of the desktop review will be completed in winter 2022/spring 2023. The review will gather additional information published since the preliminary work for the development of the Initial Project Description was completed. This work will provide an opportunity to engage with Indigenous communities to gather knowledge from available reports, maps or any other source materials (that are acceptable to be shared) that may hold Indigenous Knowledge to contribute to the assessment of potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.</p>
<p>Preliminary potential adverse impacts and mitigation of the Project were evaluated through consideration of The Project without the knowledge of environmental values or specialized AOPFN Algonquin Knowledge of this area and interconnected aquatic and terrestrial ecosystems.</p> <p>AOPFN requests that PSPC adopts a holistic design approach, that includes AOPFN Algonquin knowledge throughout the entire process of deconstruction, construction, mitigation, and restoration planning. AOPFN expects the Proponent to work with AOPFN to identify methods and approaches to achieve this to be included in the DPD.</p>	<p>The introduction to <b>Section 15 Biophysical Environment and Potential Impacts</b> will state:</p> <p>The additional information, including Indigenous Knowledge gathered in the desktop review, will contribute to a more detailed understanding of data gaps that require further investigation to evaluate potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.</p>
<p>'Residual impacts' do not mention impacts to AOPFN's loss of access and use of this area. Loss of access and degradation of this area has greatly and negatively impacted AOPFN's economic and cultural way of life.</p>	<p>Indigenous communities will be engaged in the identification of impacts and residual impacts related to access to the area associated with the Project as well as the planning and design of appropriate mitigation and enhancement measures.</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>The loss of AOPFN's ability to use this land for the last two centuries must be acknowledged and accounted for in this assessment which will require accompanying mitigation. AOPFN requests acknowledgement in the IPD that the replacement of the bridge continues the presence of the bridge and associated impacts for years to come. As such, AOPFN expects PSPC to collaborate with and ensure that AOPFN is supported to conduct appropriate and comprehensive eco-cultural restoration of this area to the spatial extent identified by AOPFN Knowledge keepers as a component of offsetting. In addition, AOPFN must be returned a renewed ability to access the area and potentially elsewhere as compensation for the continued loss of this area.</p>	<p>Further discussions to understand the eco-cultural restoration interests within scope of the Project will be needed as the Project progresses.</p>
<p>AOPFN needs more detailed description, as well as scale drawings, photographs, etc. of the existing structures, the habitat on and around these structures; cofferdams and habitat in and around where these are to be placed; and any other in-water and shoreline works.</p> <p>PSPC is requested to provide additional Project information to AOPFN when it is available and expects to also see this in the DPD.</p>	<p>Further Project details will become available during the design stage of the Project. These details will include scale drawings, descriptions of the existing structures, and other information as requested by Algonquins of Pikwakanagan First Nation. During the design phase, the IPT will engage Indigenous communities to identify concerns and determine appropriate mitigation strategies.</p>
<p>PSPC describes the Valued Components (VCs) and spatial boundaries they intend to use to assess impacts, namely the Project Development Area (PDA) and the Local Assessment Area (LAA). Table 14-1 provides the Valued Components and the spatial extent of the LAA that will be used for each of the Valued Components.</p> <p>AOPFN expects that the VCs and spatial areas for assessment will be identified in consideration of AOPFN Algonquin knowledge. The LAA for each of the 7 Valued Components (buffers around the PDA) do not include AOPFN values or AOPFN Algonquin knowledge.</p> <p>Specifically, the LAAs for Drainage and Surface Water; Vegetation; Wildlife and Wildlife Habitat; and Aquatic Environment are smaller than AOPFN requires. AOPFN expects that the Aquatic Environment and Drainage and Surface Water LAA's should more closely reflect the expected changes to the water flow and sediment transport pattern in the Ottawa River that will result from a) cofferdams during construction, b)</p>	<p>Valued components and their spatial boundaries will be reviewed and confirmed as the Project becomes better defined at the design stage. This will provide opportunities to identify valued components of concern to interested Indigenous communities and to establish appropriate boundaries for the assessment of impacts from the Project.</p> <p>The spatial boundaries for the cumulative assessment on valued components of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in the existing characteristics of the valued component.</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>change in pier and shoreline form during operation. Although PSPC predicts Project-related impacts will be encompassed within their 200-m PDA buffer, AOPFN expects these changes will extend beyond 200 meters, primarily in the downstream direction from the PDA. Changes to these Valued Component's LAAs may create changes in the other Valued Component's LAAs, for example Vegetation.</p> <p>AOPFN expects that PSPC will be using a Regional Assessment Area (RAA) in addition to the PDA and LAA, in order to assess the proposed Project's contribution to cumulative effects.</p> <p>PSPC is requested to engage with AOPFN to review and update the list of valued components and to determine the spatial boundaries of the impacted area for the Project for each VC, informed by AOPFN Algonquin knowledge and empirical data. Consideration of AOPFN-specific knowledge needs to be included in identifying appropriate valued components and indicators, as well as defining the spatial boundaries of local and regional assessment areas.</p> <p>For both the LAA and the RAA, AOPFN expects PSPC to share the rationale for selecting the spatial extents of assessment and to commit to working with AOPFN to revise VCs and spatial extents to be included in the DPD.</p>	
<p>The Acoustic Environment section only includes impacts to human health and does not consider wildlife or aquatics.</p> <p>AOPFN is concerned with impacts to terrestrial and aquatic species.</p> <p>PSPC to include an evaluation of the impacts of acoustic noise to include terrestrial and aquatic species in the Project area in the DPD.</p> <p>PSPC is requested to ensure that AOPFN Algonquin knowledge is integrated into the noise assessment and development of a mitigation plan for any impacted species.</p>	<p>The IPT will work with Indigenous communities to contribute Indigenous Knowledge to identify species of concern, determine potential sources and magnitude of impacts of acoustic noise, establish monitoring protocols and possible mitigation strategies as appropriate.</p>
<p>In discussing potential impacts to physiography, geology, and hydrogeology, PSPC mentions excavations and dewatering.</p> <p>It is unclear from descriptions and scale drawings provided, how many and where excavations are</p>	<p>The information requested is not available at this stage of the Project. Potential studies as per Table 15-9: Planned studies include hydrogeological information gathering and assessment.</p>



Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>anticipated, nor how much dewater volume PSPC could expect to be handling, and their initial thoughts on where they will direct this water.</p> <p>AOPFN desires to understand, based on excavation locations, recharge rates, dimensions and duration of excavation, etc. – what volume is PSPC anticipating to handle per day? What is anticipated total volume?</p> <p>AOPFN expects PSPC to provide adequate information, including figures at suitable scale to AOPFN directly for AOPFN to understand where excavations will occur, how much water could be dewatered, and where PSPC intends to direct this water, including cofferdams that may be far from shore. AOPFN also recommends this information be provided in the DPD</p>	<p>Further details regarding the design and methods of construction will be developed in the design stages of the Project and will be used to determine potential impacts. This information will be shared with Indigenous communities, as it becomes available, to contribute Indigenous Knowledge, identify concerns and develop appropriate mitigation strategies.</p>
<p>AOPFN is concerned that groundwater withdrawal rate amounts for dewatering may negatively impact the interconnected hydrological systems.</p> <p>PSPC is requested to conduct further study of the interconnectedness of groundwater, surface water, and the hydrological system within the watershed, once daily pump rate amounts are known.</p> <p>PSPC is requested to support AOPFN in reviewing this additional hydrological study.</p>	<p><b>Table 15-9: Planned studies</b></p> <p>Further details regarding the design and methods of construction will be developed in the design stages of the Project. Additional studies are anticipated to be required to complete the construction planning. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed.</p>
<p>PSPC mentions that some banks “are lined with armour stone and large boulders” (p. 116). In the subsection discussing potential impacts, PSPC does not explicitly state whether there are any proposed removal or additions to bank protection associated with the proposed Project.</p> <p>PSPC must provide narrative description and scale drawings of any proposed bank protection removals or additions for AOPFN review, this should also be included in the Detailed Project Description.</p>	<p>The information requested is not available at this stage of the Project.</p> <p>Further details regarding the changes to the shoreline will be developed in the design stages of the Project. This information will be shared with Indigenous communities, as it becomes available.</p>
<p>The cumulative impacts of the hundreds of dams throughout the Ottawa River watersheds have drastically impacted the natural water flow activities of all water ways. This modern human-engineered regulation of water negatively impacts the species that depend on healthy and substantial water flows – including fish, aquatic animals, and terrestrial species within the riparian zone.</p> <p>This section as written currently minimizes consideration of the highly impacted / regulated aquatic environment in which the Project is situated</p>	<p>The impact assessment of dams and restoration of natural waterflows across the watershed are outside the scope of this Project.</p> <p>The spatial boundaries for the cumulative assessment on valued components of interest such as water quantity and quality will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation strategies, may, in combination with others, cause a significant change</p>

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<p>and that it ultimately contributes to. There needs to be a disclaimer of the negative impacts to the environment from the highly regulated rivers and streams in the Ottawa River watersheds in the IPD, and documentation on how the damming of rivers has disproportionately impacted the AOPFN and other Indigenous Nations in this region included in assessment.</p> <p>The cumulative impacts of the dams must be assessed and a subsequent restoration of more natural flows within the watershed must be considered. The impacts of the Chaudière Dam (2 km away) to fish and fish habitat need to be explored and understood in connection to the Project and this should be referenced in the DPD.</p>	<p>now or in the future in the existing characteristics of the valued component.</p> <p>The bridge design will consider the impacts to fish and fish habitat by evaluating options to reduce the number of supporting piers in the river. This is anticipated to decrease the long-term footprint on fish habitat in the river.</p> <p>The bridge design is not anticipated to, at any point, impede or restrict the movement of aquatic species in the area (such as a dam might). Construction methods to be used will not impede movement of species, neither will the design and long-term operations.</p>
<p>While PSPC recognizes that erosion and sedimentation rates can be influenced by changes in water flow and velocity, resulting from changes in the piers, they do not describe what impacts may result, e.g., change in downstream deposition areas. This is referred to as 'catch-and-release', raising a point but dropping it from consideration.</p> <p>Related to this, PSPC does not mention or describe changes in water flow and velocity that will result from cofferdam placement on the riverbed.</p> <p>In fact, in reading PSPC's potential impacts section, it is apparent PSPC considers the proposed Project's impacts to be related to water quality; increased sediment load during construction and possible contaminants from the bridge deck during operation.</p> <p>While these are important impact pathways, especially sediment load during construction, AOPFN sees significant gaps in this understanding.</p> <p>AOPFN predicts the largest impact to surface water from this project will be change to water flow and velocity, especially related to the cofferdams. This impact will extend to how fish and other wildlife use the water by virtue of this physical change.</p> <p>Secondarily, this will change sediment transport in the river and there is potential for noticeable change in downstream deposition areas, especially resulting from change to flow around the cofferdams.</p> <p>As AOPFN already mentioned, spatial extent of study areas need to capture impacts, this issue being the</p>	<p>The IPT agrees that it is important to design the bridge to minimize impacts to the river. The design of the bridge and methods of construction will be developed during the next phase of the Project. While detailed information about bridge construction methods is not yet available in this DPD, the IPT will continue consulting with Indigenous communities during the design phase of this project. The IPT will engage Algonquins of Pikwakanagan First Nation and other Indigenous communities to contribute Indigenous Knowledge, identify concerns and discuss appropriate mitigation strategies.</p> <p>The Project will be reviewed in detail by DFO and is expected to require a Fisheries Act authorization. This Act and authorizations under it will ensure all potential impacts to fish and fish habitat from construction activities are thoroughly evaluated, and that impacts are reduced and mitigated. If impacts cannot be adequately reduced or mitigated, we will work with DFO and interested communities to propose compensation and/or habitat offset measures, as required.</p> <p>Hydrological assessments are anticipated to be required for the design of the piers for the new bridge to understand the risks for the structure as well as impacts on navigation and sediment transport from potential changes in the water flow and velocity. This assessment will provide guidance in the selection and configuration of coffer dams, if needed in the construction stages, as well as approaches to reduce</p>



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<p>fundamental concern AOPFN has with the spatial boundaries.</p> <p>PSPC is requested to conduct a construction- stage and operation-stage sediment transport model, including predictions of deposition area(s), and recalibrate study and assessment boundaries.</p> <p>Since this is the primary impact source of the proposed Project, AOPFN expects much more detail in PSPC's DPD, including such things as:</p> <ul style="list-style-type: none"> <li>• Detailed descriptions of such things as: <ul style="list-style-type: none"> <li>○ temporary barge construction (where, dimensions, anticipated water quality; and fish habitat impact?)</li> <li>○ Cofferd dams (#, placement, dimensions) – predicted impact on water quality (and fish habitat)</li> <li>○ Caisson and cofferdam dewatering – predicted volumes, dewatering location, schedule</li> </ul> </li> <li>• Removal of cofferdam –predicted water quality impact</li> <li>• Abutment excavation (dimensions, pit dewatering expectations, schedule)</li> <li>• De-construct piers, abutments and placing fill</li> <li>• Provide figures and scale drawings at adequate scale</li> <li>• Provide conceptual schedule for works and activities in and around water, for example: start and end of coffer dams, anticipated period of dewatering; start and end of abutments construction (in or near water portions); start and end of bank protection removal/installation.</li> </ul>	<p>impacts and provide direction on mitigation needed to isolate the construction areas.</p> <p>The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and discuss appropriate mitigation strategies.</p> <p>Once the bridge design is advanced and construction activities and methods are determined, potential significant negative impacts on water temperature and flow levels in the vicinity of the bridge will be further evaluated, along with linkages to other potential impacts (disturbances to aquatic species, erosion of riverbank, etc.).</p>
<p>There is no mention of impacts to fish or fish habitat in connection to the changes in water quality (deleterious substances) during deconstruction and construction. There is mention of toxins and high levels of turbidity and velocity in this section, yet no mention of the impacts to fish and fish habitat.</p> <p>PSPC must revise this section to include a more holistic analysis reviewing potential toxins released into the Project Area water way and interconnected shoreline and embarkment, that is informed by AOPFN Algonquin knowledge.</p>	<p>The IPT is committed to understanding the effects of the Project on fish and fish habitat before beginning construction. The IPT will work with Algonquins of Pikwakanagan First Nation and other interested Indigenous communities to study potential effects through the DFO Fisheries Act authorization process.</p> <p>Additional information will be obtained from the planned studies to characterise the aquatic habitat and determine the presence of species.</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>PSPC must commit to engage with AOPFN to determine the impacts of construction and deconstruction, including around impacts / changes to water quality.</p>	
<p>This section does address the creation of an Environmental Protection Plan (EPP) although does not consider the knowledge of AOPFN or other impacted Indigenous Nations.</p> <p>AOPFN expects to be afforded the opportunity to guide and develop environmental management plans, including environmental enhancements. Several statements are made throughout the IPD regarding development of environmental management plans; AOPFN suggests clarity in roles and input be made throughout future documents, e.g., the DPD, to reflect AOPFN's anticipated input.</p> <p>AOPFN's interests and environmental knowledge must be supported, funded, and integrated into the framework of the anticipated components of the EPP for mitigation and protective measures in this section. The systems thinking process for this section is reductionist (not holistic), nor does it consider cumulative impacts. Please include commitment to directly engage AOPFN and AOPFN knowledge keepers on the development of the EPP within the IPP.</p>	<p>The Environmental Protection Plan is developed by the construction contractor in response to design and specifications. It will address any potential impacts raised by the IPT in the specifications. The Environmental Protection Plan components will be shared with Algonquins of Pikwakanagan First Nation and other Indigenous communities as part of the engagement process to provide opportunities to contribute Indigenous Knowledge and address concerns.</p> <p>The IPT will work with interested Indigenous communities to include their interests and environmental knowledge in the Project. This effort will include ongoing consultation, the participation of Indigenous communities in studies, and discussion of potential mitigation options.</p>
<p>In describing the cultural areas, only settler institutions are mentioned.</p> <p>AOPFN cultural history and their impacts to the landscape must be added to this section. These ecosystems have been managed by AOPFN since time immemorial; the landscape has been shaped through continuous AOPFN management activities before and since their displacement by settlers.</p>	<p>The IPT looks forward to working with Algonquins of Pikwakanagan First Nation as part of the engagement process to incorporate Indigenous Knowledge to the baseline information used in the assessment of potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.</p>
<p>Species at risk management can be a valuable conservation and strategic restoration tool. Stating this, all plant species are important to AOPFN in the Project area and the Project's impacts to plant species need to be managed in a holistic way.</p> <p>AOPFN knowledge keepers must be included in the assessment of creating values for plants in the framework design of the Project, as well as strategies for eco-cultural restoration.</p>	<p>The IPT looks forward to working with Indigenous communities as part of the engagement process to incorporate Indigenous Knowledge to the baseline information used in the assessment of potential biophysical impacts.</p>
<p>PSPC mentions pre-construction survey that will be undertaken to confirm plant SAR presence,</p>	<p>Field surveys will be conducted prior to the detailed design stage to identify the presence of fish and fish habitat within the Project area. After field surveys are</p>



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<p>presumably as well as to identify weed populations and inventory and classify plant communities.</p> <p>AOPFN would like to clarify whether PSPC also plans to inventory and classify aquatic and semi-aquatic plant communities.</p> <p>PSPC is requested to confirm the scope of the plant survey. AOPFN requests involvement of Algonquin knowledge keepers to identifying the appropriate scale and scope of this survey. AOPFN looks forward to receiving further information from PSPC regarding the scope and timing of studies.</p>	<p>conducted, species specific mitigation measures and permit requirements will be confirmed. Further discussion is provided in Section 15.1.2.2 Aquatic Environment, Mitigation and Protective Measures.</p> <p>Aquatic and semi-aquatic habitat characterisation will be completed as part of the fish habitat surveys. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed.</p>
<p>PSPC refers to a compensation plan that includes re-planting and/or financial contributions for impacts to (off-site) natural areas and vegetation.</p> <p>AOPFN requests PSPC provide description and site drawings of on-site and off-site natural areas, as well as trees, by species, that have roots or branches on-site (even if the tree stem is off-site) to better understand the compensation plan.</p> <p>Also provide conceptual compensation plan based on PSPC's current understanding of impacts to natural areas and vegetation.</p> <p>AOPFN requests that PSPC provide this additional information directly to AOPFN and recommends this be included in the DPD.</p> <p>In addition, AOPFN Algonquin Knowledge of plant species must be included in the design of any habitat restoration plans for the Project.</p>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.</p>
<p>All wildlife species are important to AOPFN within the Project area.</p> <p>AOPFN knowledge keepers must be included in creating the list of species, designing values for wildlife, and in strategies for eco-cultural restoration. AOPFN must be part of the design and development of habitat restoration plans.</p>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p>
<p>PSPC does not include consistent discussion/assessment of wildlife aquatic, semi-aquatic, and riparian habitat that may be impacted by the project. For example, there is general discussion of potential impacts to turtles from sediment load (p. 134), but Table 14-7 does not indicate work in aquatic environments will impact habitat. AOPFN expects PSPC to consider these types of impacts in their</p>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>assessment, recognizing the potential impacts from change to sediment transport, deposition areas, etc.</p> <p>Include discussion in the wildlife and wildlife habitat section of the DPD to account for impacts from aquatic work and activities, and changes to the water flow and sediment transport regimes.</p>	
<p>AOPFN Algonquin knowledge of species present, species interactions, and migration patterns are not mentioned in the mitigation and protective measures assessment.</p> <p>AOPFN Algonquin knowledge must be included in the design of mitigation and protective measures for wildlife. AOPFN Algonquin Knowledge Keepers also have specialized knowledge of the ways in which the Project area can be restored and must be included in the design of eco-cultural improvements to the area post construction.</p> <p>PSPC needs to commit to developing protective measures and enhancement measures for wildlife with Indigenous communities.</p>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures if required.</p>
<p>A holistic, non-reductionist and long- term vision for birds and birds migration routes impacted by The Project was not considered. AOPFN Algonquin Knowledge needs to be included in the design of the bird field surveys during project design progress.</p> <p>AOPFN and AOPFN Algonquin Knowledge Keepers need to be part of the development of the design of the bird field surveys during project design progress.</p>	<p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage Indigenous communities to contribute Indigenous Knowledge that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.</p>
<p>The entire Aquatic Environment section exclusively uses a western science approach to understanding the study area. There is no research lens or supporting documentation included that incorporates an Indigenous understanding of the aquatic and interconnected environment, nor in the creation of buffer zones.</p> <p>AOPFN Algonquin knowledge of the aquatic environment (species, management, history, cultural use, trade, abundance, life cycles, etc.) must be upheld and braided into the entire Aquatic Environment section.</p> <p>AOPFN needs to be included in all enhancement and restoration activities of impacted species. PSPC must work with AOPFN to address gaps in the Aquatic Environment characterization in the DPD.</p>	<p>The IPT looks forward to working with Algonquins of Pikwakanagan First Nation and other Indigenous communities as part of the engagement process to identify sources of environmental knowledge.</p> <p>The IPT will seek advice from internal and external experts, including federal and provincial authorities (ECCC, DFO, MNRF, MEFCWP, etc.), and will engage with Indigenous communities to contribute Indigenous Knowledge that will help to shape the design and implementation of future studies.</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>PSPC provides an overview of their regulatory requirements for harmful alteration, disruption or destruction of fish habitat.</p> <p>AOP notes PSPC references to the difference in some aquatic species at risk protection between provincial and federal legislation, depending on where they are listed (e.g. within ON, QC, or federal legislation).</p> <p>AOPFN notes PSPC's statement that "details of habitat offsetting will require further analysis and calculation of habitat impacts at the detailed design stage" (p. 146). AOPFN expects habitat offsetting details be required within the IS so AOPFN can better understand impact mitigation and compensation.</p> <p>AOPFN also notes PSPC reference to calculating footprint from the PDA. AOPFN expects the following inputs for calculating 'footprint', or HADD:</p> <p><u>Net habitat</u></p> <ul style="list-style-type: none"> <li>• old vs new pier footprint</li> <li>• old vs new embankment</li> <li>• temp coffer dam placement</li> <li>• water flow change and resulting scour/deposition change (during construction, and old vs new piers)</li> <li>• need to account for cumulative effects (see Section 14.2.3.5 of the IPD)</li> </ul> <p><u>Information needed:</u></p> <ul style="list-style-type: none"> <li>• habitat types, function – overlay footprint</li> <li>• compensation ratios that will be used</li> <li>• conceptual designs</li> </ul> <p>This information can and should be included in PSPC's Impact Statement so AOPFN can make an informed decision on how impacts will be addressed; and to demonstrate to IAAC how IK has informed the project.</p> <p>AOPFN needs to be involved in the process of considering the potential impacts of all aquatic species at risk, regardless of which SAR regulations apply. As a single area that spans multiple jurisdictions, PSPC should use a precautionary and holistic approach when considering impacts and for standards of protection, offsetting, and mitigation for aquatic species at risk.</p>	<p>Noted for future discussions.</p>
<p>Although there is a section "Baseline Conditions: Indigenous Peoples", AOPFN knowledge is not</p>	<p>The IPT will work with interested Indigenous communities to include their interests and</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
<p>mentioned / considered in the other list of future studies.</p> <p>AOPFN appreciates the information provided by PSPC concerning future studies. Reference should be made in the IPD concerning planned continued AOPFN engagement on the design and creation of other future study materials.</p> <p>Please note that AOPFN , in addition to collaboration on studies with PSPC, needs to be included in the entirety of framework design for planning and mitigating environmental concerns for the Project Area.</p>	<p>environmental knowledge in the Project. This effort will include ongoing consultation, the participation Indigenous communities in studies, and discussion of potential mitigation options.</p>
<p>AOPFN and AOPFN Indigenous Knowledge is not included in the Climate Change Assessment section.</p> <p>Climate change assessments need to use a more holistic framework and include Indigenous Knowledges. AOPFN has valuable AOPFN Algonquin knowledge to help support the development of this section, and their knowledge should be considered and utilized in mitigating and planning for the impacts and parameters of climate change.</p>	<p>The IPT looks forward working with interested Indigenous communities to develop an approach to collect Indigenous Knowledge to be integrated in the climate vulnerability and risk assessment. Then, together, determine how the knowledge will contribute to mitigating and planning for the impacts of climate change.</p>
<p>Section 15 (of the IPD) notes, "To identify potential social, economic, and human health considerations relevant to the Project, a desktop review of available information in the form of reports, maps and publicly available databases has been conducted" AOPFN was not aware that this review was taking place.</p> <p>AOPFN would like to see any reporting associated with this Desktop Review and requests that a similar desktop review process for the human environment be established to mirror what PSPC is planning on doing for the biophysical desktop review.</p>	<p>A separate report was not produced from the desktop review. The information collected was used and integrated directly to craft the text of the IPD.</p> <p>Further discussions will assist in determining information needed.</p>
<p>AOPFN is pleased that there is support for AOPFN to create a position that will design and develop CES, IK, TUS, archeology, and environmental studies for the Project. As noted in the IPD, understanding impacts cannot be fully understood until more information about the Project is available.</p> <p>AOPFN recommends using this position and these activities as an opportunity to engage with PSPC to determine additional information on potential benefits of the Project for AOPFN (i.e., restoration of fish habitat to address current impacts to fish populations and result in a net improvement in fish habitat in the Ottawa River following this replacement</p>	<p>The IPT looks forward to working with Indigenous communities as part of the engagement process to incorporate Indigenous Knowledge to the baseline information used in the assessment of potential biophysical impacts that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.</p>



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<p>work; restoration of shoreline to support net improvements to values of importance to AOPFN).</p> <p>AOPFN recommends continued and enhanced participation of AOPFN in defining interests and concerns for the protection and restoration of the Ottawa River, particularly in terms of fisheries and species within the interconnected river-terrestrial (shoreline) area. This should include, but not be limited to:</p> <ul style="list-style-type: none"> <li>identifying the specific valued components related to the aquatic ecosystem (including species and habitat that may be impacted by the project),</li> <li>identifying local and regional assessment areas for valued components based on AOPFN knowledge, meaningfully integrating a comprehensive understanding of cumulative effects from AOPFN's perspective and incorporating that input into mitigations, and integrating AOPFN-specific knowledge in determining, monitoring, and offsetting the potential impacts of the project to the surrounding environment.</li> </ul> <p>AOPFN would like to note that, given that the Project will be extending the timeframe of disturbance from the bridge, including to fish and fish habitat as well as riparian values, AOPFN may seek additional offsetting and compensation measures outside of the impacted area. It would be of particular value to consider co-designing an approach to habitat compensation / offsetting that explicitly integrates AOPFN Algonquin knowledge into these calculations.</p>	
<b>What We Heard Through Consultation</b>	
<p>Participation in project studies: community will conduct its own studies and will determine later how it will participate in studies led by the IPT.</p>	<p>Funding has been provided by the IPT according to a work plan and budget provided by Algonquins of Pikwakanagan First Nation.</p> <p>Additional work items identified by Algonquins of Pikwakanagan First Nation during the impact assessment will be discussed by a joint working group.</p>
<p>Respect for culture of original inhabitants, including acknowledgement of Algonquin culture and history in the bridge design/ structure, and the protection of cultural heritage and sacred sites.</p>	<p>The IPT acknowledges the importance of the Algonquin Anishinabeg Nation's rich history, language and culture to the Capital Region. The IPT will initiate a dialogue with key stakeholders and Indigenous communities to discuss ways to collect and validate information on physical and cultural heritage and</p>

Area of Concern or Interest	Integrated Project Team's (IPT) response
	values to contribute to the design of the new bridge and achievement of the vision of creating a bridge reflective of Canadian values and identity.
Participation/requirement to guide and develop environmental management and restoration plans, including environmental enhancements.	Early and continuous engagement will occur with all potentially impacted Indigenous communities, including funding to lead their own studies and participate in Project studies.
Protective and enhancement for wildlife, and habitat restoration plans must be developed with Indigenous involvement.	The IPT will provide opportunities for Indigenous Communities to be involved in the creation of protective and enhancement wildlife and habitat restoration plans.
Sustainability: Proponents should use environmentally friendly components in project design - e.g., precast concrete, recycled steel, aluminum, solar powered component, waste reduction strategies.	<p>Following the Treasury Board's Greening Government Strategy (2020), sustainability principles are fundamental to all aspects of the project.</p> <p>Several sustainability factors such as consideration for the well-being of present and future generations will be included in the impact assessment as well as design and construction processes. These include alternative means and considerations for the choice of design elements and construction materials (section 10); selection of valued components for further studies (section 15); socio-economic factors and commemoration of heritage values (section 16); addressing contributions to climate change through greenhouse gas emissions (section 20), and potential adverse impacts from waste (section 21).</p>
Algonquins of Pikwakanagan First Nation members and businesses must benefit from economic opportunities.	The IPT is working in several ways to support the economic participation of community members and businesses. The IPT has provided funding for Algonquins of Pikwakanagan First Nation to develop and maintain an inventory of skills and proficiencies. Indigenous Participation Plans are being required of all contracts associated with the Project, with the goal of matching the community's skills and proficiencies with the Project requirements. The IPT will address training and development needs that are identified by the community. The Indigenous Participation Plans can also be used to support innovative measures identified by the community, such as bursaries for students.
Algonquins of Pikwakanagan First Nation will consider a full range of environmental studies that it may undertake, including a cumulative effects study on the legacy of the effects from all structures built in the Ottawa River needs to create a position to manage the environmental assessment activities for five years.	Agreed. Funding will be made available from PSPC and the NCC for the studies to be led by Algonquins of Pikwakanagan First Nation and for the new position. Information about the replacement bridge will be shared as it is developed.



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<p>Algonquins of Pikwakanagan First Nation will assess its budget needs and bring the information forward. Specific comments about potential impacts cannot be made until more information about the bridge replacement is available.</p> <p>Specific comments about potential impacts cannot be made until more information about the bridge replacement is available.</p>	
<p>The Ottawa River is of great importance to Algonquins of Pikwakanagan First Nation, from its historic role in transportation, commerce and harvesting, to its significance today for sustainable living. The current community location was not chosen by them they were forced to move there. The relocation has had historic impacts on health and social traditions, and the community is trying to reclaim its traditions.</p>	<p>Understood. PSPC and the NCC are committed to supporting reconciliation between the Crown and Indigenous communities and will work with Algonquins of Pikwakanagan First Nation to ensure the replacement bridge and other crossings Projects have positive benefits for Indigenous people.</p>
<p>The cumulative effects assessment is linked to recognition and support for Indigenous rights and could be vital in providing recommendations concerning mitigation and compensation related to the Project and the NCA crossings program of work.</p> <p>Algonquins of Pikwakanagan First Nation is prepared to commence the work to select a consultant and begin the assessment.</p>	<p>Algonquins of Pikwakanagan First Nation are encouraged to continue the work on the cumulative effects assessment for the Ottawa River already initiated. Funding requested to complete the work related to the Alexandra Bridge specifically will be further discussed.</p>

### 19.3.5 Summary of Engagement – Kebaowek First Nation

**Table 19-3: Summary of Engagement – Kebaowek First Nation**

A summary of the points raised in the table submitted by Kebaowek First Nation are provided in the table below.

Area of concern or Interest	Integrated Project team's (IPT) response
<b>Registry Comments</b>	
<p>KFN would like to be engaged through a fully resourced Letter of Intent (LOI) that would guide the development of "proponent process agreement(s) modeled after the PSPC-TDQRP project." KFN requests confidentiality agreement be signed by PSPC to share existing KFN agreement templates.</p>	<p>The Confidentiality Agreement provided by Kebaowek First Nation was signed by PSPC and NCC representatives and returned to the First Nation.</p> <p>All parties are now working to complete the Letter of Intent and funding agreements to support meaningful engagement opportunities for Kebaowek First Nation.</p>

<p>KFN is concerned with environmental impacts and community's concerned with a history of projects in the Ottawa River watershed that have resulted in disturbances and contamination. KFN wants to see a cumulative effects or regional assessment of the Ottawa River watershed.</p> <p>The First Nation will conduct its own studies.</p>	<p>The IPT is committed to meaningful consultation on the Alexandra Bridge Replacement Project.</p> <p>Additional discussions will be needed to understand the cumulative effects of concern. When more details are available at the bridge design stage, residual impacts on Valued Components (VCs) that may contribute incrementally to existing cumulative effects will be confirmed and evaluated.</p> <p>The spatial boundaries for the cumulative assessment on valued components of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in the existing characteristics of the valued component.</p> <p>The IPT will work with Indigenous communities to plan the scope of studies to gather information on the biophysical characteristics of the river to be conducted as part of the Project.</p>
<p>Concerning social impacts emphasis is needed on GBA+ especially recognizing the historic role of Algonquin women as water keepers.</p>	<p>The IPT is committed to including consideration of the potential impacts on diverse communities resulting from changes to health, social, economic conditions, impacts on heritage, and the use of lands and resources for traditional purposes. Each Indigenous group will consider how to engage with its own subpopulations throughout the Project.</p>
<p>Emphasis should be given to arts and culture seeking creative Anishinaabeg ideas in design and appearance including story telling.</p>	<p>The IPT will provide opportunities for Indigenous communities to contribute Indigenous Knowledge to inform the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments.</p>
<p>Kebaowek First Nation does not accept or acknowledge any claims to any Aboriginal or Treaty Rights made by the Algonquins of Ontario ('AOO') or recognize AOO as an entity entitled to consultation or accommodation in Impact Assessments on Algonquin Anishinaabeg lands.</p>	<p>The IPT is committed to consulting with Kebaowek First Nation to understand the potential impacts that may arise from the proposed bridge replacement project.</p> <p>The IPT is engaging with a wide range of potentially impacted individuals, communities, local businesses, municipal, provincial as well as other government departments that may be impacted from the Project. The IPT seeks to gather information that will contribute to the understanding of potential impacts to determine mitigation strategies required to minimize them.</p>



<p>Kebaowek First Nation or Algonquin Nation does not divide itself between Ontario and Quebec this needs to be reflected in Indigenous engagement lists.</p> <p>Delete title Indigenous Communities within Quebec this is not a reflection of traditional land use base of the Algonquin Nation.</p>	<p>The IPT has listed Indigenous communities alphabetically in the document.</p>
<p>Section 13.4 Proximity to Indigenous Lands Figure 13-6: Distance of Indigenous Communities to the Project this is not reflective of traditional land use of the Algonquin Nation but rather the Indian Act and reserve lands. Kebaowek community members are not limited to reserve lands.</p> <p>Each community entity must be described for its land use and rights area in relation to the project.</p>	<p>The Figure was included as a reference to assist readers in locating the main community associated with each Indigenous community.</p>
<p>Traditional Ecological Knowledge (TEK) needs to have a more established role in studies and mitigation processes.</p> <p>Special TEK emphasis needs to be placed on Species At Risk including desktop screening page 143- no Aboriginal Species at Risk work is cited- contact DFO and Canadian Wildlife Services for AFSAR and add to project description.</p>	<p>An update of the desktop review will be completed in winter 2022/spring 2023. The review will gather additional information published since the preliminary work for the development of the Initial Project Description was completed. This work will provide an opportunity to engage with Indigenous communities to gather knowledge from available reports, maps or any other source materials (that are acceptable to be shared) that may hold Indigenous Knowledge to contribute to the assessment of potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.</p> <p>The additional information, including Indigenous Knowledge gathered in the desktop review, will contribute to a more detailed understanding of data gaps that require further investigation to evaluate potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.</p>
<p>Energy Services Acquisition Program engagement was less than ideal in the environmental effects evaluation- no community engagement in fisheries study or navigation until permitting deadline. Term sheet had to be established post permitting to incorporate TEK knowledge study into fisheries offset plan. PSPC needs to focus on community consultation agreements in early engagement.</p>	<p>Noted.</p> <p>Further details regarding the design and methods of construction will be developed in the design stages of the Project. Additional studies are anticipated to be required to complete the construction planning. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed.</p> <p>The nature of participation will be determined by the Indigenous communities themselves, including:</p> <ul style="list-style-type: none"> <li>• reviewing draft Terms of References for studies</li> <li>• leading studies with financial support from the IPT and providing the results to the IPT</li> <li>• participating in parallel with the work of external experts hired by the IPT</li> </ul>



	<ul style="list-style-type: none"> <li>reviewing the results of studies undertaken under the direction of the IPT and providing comments and guidance</li> </ul>
<p>Section 18.1 Proponents Initial Assessment of Impacts on Indigenous Peoples’ Changes in the Environment Section 18.2 Identification of Potential Impacts on the Environment Kebaowek First Nation. Needs to reference Indigenous Knowledge study for each subject heading.</p> <ul style="list-style-type: none"> <li>The Ottawa River should be identified as a “Valued Component” in the EIS. An assessment of potential impacts of the Alexandra Bridge on Ottawa River aquatic biota in progress.</li> <li>Description of the food chain and food web dynamics as a habitat component as this relates to fish populations, and detailed fish habitat mapping;</li> <li>Aquatic species at risk at site Lake Sturgeon, American Eel, and other valued fish species found in the Ottawa River impoundment issues.</li> <li>Contaminant levels in aquatic and semi-aquatic mammals from upstream nuclear, agriculture etc. Soils survey Sediment survey ;</li> <li>Cumulative effects of the project in conjunction with existing levels of toxic chemical pollution from nuclear, agricultural etc.</li> <li>Impacts of contaminants on food source integrity of fisheries;</li> <li>Effects of contaminants on aquatic organisms;</li> <li>Peak flows and low flows;</li> <li>Construction phase impacts on the aquatic environment; and</li> <li>Water quality and overflows related to project planned activity.</li> </ul>	<p>As with other biophysical studies, the IPT is committed to working with Kebaowek First Nation and other Indigenous communities so that the design of the studies address the concerns raised. Some studies will address potential effects on fish through the DFO <i>Fisheries Act</i> authorization process. Other studies include those discussed in <b>Section 15.3</b>.</p> <p>Additional discussions will be needed to understand the cumulative effects of concern. When more details are available at the bridge design stage, residual impacts on Valued Components (VCs) that may contribute incrementally to existing cumulative effects will be confirmed and evaluated.</p> <p>The spatial boundaries for the cumulative assessment on valued components of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in the existing characteristics of the valued component.</p>
<p>Record 214 of <a href="#">Appendix D</a>: Indigenous Engagement states: The First Nation provided a Non Disclosure Agreement.” Should be replaced by: “The First Nation provided a confidentiality agreement.”</p>	<p>Noted and corrected.</p>
<p><b>What We Heard Through Consultation</b></p>	



<p>Economic impacts – training, apprenticeships, employment and contracting. The importance of short-, medium- and long-term employment opportunities for Indigenous people.</p>	<p>An Indigenous Participation Plan will be created in partnership with the First Nation addressing the most effective ways to increase access to employment, contracting, training and apprenticeships, and to identify and overcome barriers to Indigenous participation.</p> <p>The procurement process for the Project will require bidders to submit Indigenous Participation Plans that increase access to employment, contracting, training and apprenticeships.</p> <p>The IPT will work with Indigenous communities to obtain the appropriate assistance and changes from other Government of Canada departments and agencies and other parties that can help increase Indigenous participation in the economy.</p>
<p>Economic impacts – training, apprenticeships, employment and contracting. The need for opportunities for students in science, technology and engineering fields to obtain education and employment</p>	<p>Work with the First Nation to identify current students and those with interests in becoming students in these fields. Explore options for the human resources capacity of PSPC and the NCC to offer summer employment and full-time employment, job shadowing and other measures that will encourage students and provide opportunities.</p> <p>The procurement process for the Project will require bidders to submit Indigenous Participation Plans that increase access to employment, contracting, training and apprenticeships.</p>
<p>Economic impacts – training, apprenticeships, employment and contracting.  Improved access to training and apprenticeships.</p>	<p>Work with the First Nation to identify candidates for training and apprenticeships. Connect the candidates to Government of Canada assistance programs for training and apprenticeships.</p> <p>The procurement process for the Project will require bidders to submit Indigenous Participation Plans that increase access to employment, contracting, training and apprenticeships.</p>
<p>Economic impacts – training, apprenticeships, employment and contracting. Identify and eliminate barriers to economic participation for Indigenous people and businesses.</p>	<p>Work with the First Nation to understand the barriers and resolve them if they are within the authorities of PSPC and the NCC. For other barriers, explore opportunities to work with the First Nation with other Government of Canada departments and agencies, other governments and the private sector on solutions.</p>
<p>Economic impacts – training, apprenticeships, employment and contracting. The Indigenous benefits aspect of the contracting should address improvements to living conditions in First Nations.</p>	<p>The Indigenous Participation Plans required of bidders could include a provision for addressing other community needs as a scored item in the review process. PSPC and the NCC could assist bidders to communicate with the First Nation to understand community needs.</p>

<p>Economic impacts: The procurement processes for the Project and the other crossings must state the requirements to include Indigenous people and Indigenous benefits up front in the procurement processes, and that Indigenous engagement and hiring commitments be built into the contracts.</p>	<p>The procurement process for the Project will require bidders to implement Indigenous Participation Plans to increase access to employment, contracting, training and apprenticeships.</p> <p>PSPC will collaborate with the Indigenous communities being engaged to develop the procurement documents, and to address needs and barriers that have prevented Indigenous participation in the past.</p>
<p>Socio-economic conditions: Other critical success factors must be in place if members of Algonquin Nations are to work in Ottawa-Gatineau, especially access to affordable housing.</p>	<p>PSPC and NCC will work with other Government of Canada partners and Indigenous organizations to explore solutions to address the critical success factors.</p>
<p>Environmental Impacts: The design of the replacement bridge could impede the movement of aquatic species throughout the Ottawa River watershed, and damage spawning grounds and fish habitat.</p>	<p>The bridge will be designed and constructed to not impede or restrict the movement of aquatic species in the area.</p> <p>The bridge design will consider the impacts to fish and fish habitat. A reduction in the number of supporting piers will decrease the footprint of impact on physical fish habitat in the river.</p> <p>The bridge will be designed to not, at any point, impede or restrict the movement of aquatic species in the area, (such as a dam might). Construction methods to be used will not impede movement of species, neither will the design and long-term operations.</p> <p>The Project will be reviewed in detail by the Department of Fisheries and Oceans (DFO) and is expected to require a Fisheries Act authorization. This Act and authorizations under it will ensure all potential impacts to fish and fish habitat activities are thoroughly evaluated, and that any impacts will then be reduced and mitigated.</p>
<p>Construction activities could damage spawning grounds and fish habitat in the vicinity of the bridge, harming fish populations throughout the Ottawa River watershed.</p>	<p>Given the nature and scope of this Project, it is probable that as a result of construction activities, there could be some damage to spawning grounds and fish habitat in the vicinity of the bridge, along with aquatic species.</p> <p>The Project will be reviewed in detail by DFO and is expected to require a <i>Fisheries Act</i> authorization. This Act and authorizations under it will ensure all potential impacts to fish and fish habitat for all construction activities are thoroughly evaluated, and that impacts are reduced and mitigated. If impacts cannot be adequately reduced or mitigated, we will work with DFO and interested indigenous</p>





	<p>communities to propose compensation and/or habitat offset measures, as required</p> <p>Section 15 provides additional details on the Bio-Physical environment and proposed mitigation and enhancement measures.</p>
<p>Environmental Impacts: Need for fish habitat restoration and monitoring after completion of construction.</p>	<p>The effectiveness of mitigation measures will be monitored to ensure that there is no long-term harm to fish and other aquatic species.</p> <p>Areas affected by construction that can be rehabilitated will be restored.</p> <p>Habitat creation, restoration and other offsetting measures will be considered to achieve positive net environmental benefits over the long-term.</p> <p>Once further information is known on impacts, and if required, the IPT will be proposing a monitoring plan to monitor the effectiveness of mitigation measures and ensure that there is no long-term harm to fish (and other aquatic species) in the area.</p> <p>After completion of pier construction, areas affected by construction that can be rehabilitated will be restored. PSPC will consider enhancing fish habitat taking into account advice and recommendations from Indigenous communities, DFO, and experts.</p> <p>Through the implementation of habitat creation, restoration and other offsetting measures, impacts from this Project on fish and fish habitat to achieve net environmental benefits may be positive over the long-term.</p>
<p>Construction activities could have negative impacts on water temperature and flow levels in the vicinity of the bridge, affecting fish spawning in the area.</p>	<p>Once bridge design is advanced and construction activities and methods are determined, potential significant negative impacts on water temperature and flow levels in the vicinity of the bridge will be further evaluated, along with linkages to other potential impacts (disturbances to aquatic species, erosion of riverbank, etc.). Appropriate mitigation measures will be established to address the impacts.</p>
<p>Need for financial support for engagement activities and to support members to share in economic benefits.</p>	<p>Discussions are underway about the Nation's needs for financial support.</p>
<p>Health impacts: The bridge design, construction and operations may have negative effects on fish populations, which will have negative health effects on community members who rely on the fishery for their food requirements.</p>	<p>The effectiveness of mitigation measures will be monitored to ensure that there is no long-term harm to fish and other aquatic species.</p> <p>Areas affected by construction that can be rehabilitated will be restored.</p>



	Habitat creation, restoration and other offsetting measures will be considered to achieve positive net environmental benefits over the long-term.
First Nation must have the right to review and approve mitigation measures.	Throughout the process, the IPT will engage and discuss with Indigenous communities about the proposed mitigation and enhancement measures to ensure these are adequate and to reasonably meet all concerns, and informed by indigenous knowledge, perspective and advice.

### 19.3.6 Summary of Engagement – Kitigan Zibi Anishinabeg First Nation

**Table 19-4: Summary of Engagement – Kitigan Zibi Anishinabeg First Nation**

Area of concern or Interest	Integrated Project team’s (IPT) response
<b>What We Heard Through Consultation</b>	
Kitigan Zibi is interested in any potential employment, training, and contract opportunities for its people.	<p>An Indigenous Participation Plan will be created in partnership with the First Nation addressing the most effective ways to increase access to employment, contracting, training and apprenticeships, and to identify and overcome barriers to Indigenous participation.</p> <p>The procurement process for the Project will require bidders to submit Indigenous Participation Plans that increase access to employment, contracting, training and apprenticeships.</p>
PSPC described the Indigenous Participation Plan approach that will be used in procurements to increase the benefits available to Indigenous workers, businesses, and communities. The Chief would like PSPC/NCC to make a complete presentation to the Kitigan Zibi Anishinabeg First Nation Council on the procurements and on the Alexandra Bridge replacement.	Agreed. Will await direction from the Chief on timing of the meeting with Council.
Engagement and consultation should occur with rights-holding Algonquin Nations.	Engagement will occur with all potentially impacted Indigenous communities.
Kitigan Zibi Anishinabeg Council stated in a letter of August 6, 2020 (Record #69) that it is interested in any/all potential archaeological digs that may take place as a result of working being carried out.	The IPT is committed to following the established protocol. A protocol between the NCC, Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation was signed on August 22, 2012, and updated on March 13, 2017. The protocol provides a framework for the engagement of Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation in all stages of archaeological investigations undertaken on NCC land. It ensures that Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation are

	<p>fully informed of such investigations and fully involved in the decision-making process regarding the co-management of archaeological resources discovered through investigations or construction and development work.</p> <p>Kitigan Zibi Anishinabeg First Nation indicated that initial key issues are related to water quality, fish habitat and archaeology. Additional issues may be noted as engagement continues.</p>
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### 19.3.7 Summary of Engagement – La Nation Anishnabe du Lac Simon

In initial discussions, the Nation has expressed interest in economic opportunities. The IPT will work with La Nation Anishnabe du Lac Simon on an Indigenous Participation Plan to ensure economic opportunities are available.

### 19.3.8 Summary of Engagement – La Nation Huronne-Wendat

La Nation Huronne-Wendat submitted a letter to the IAAC outlining their comments. A summary of the points raised in the letter are provided in the table below.

**Table 19-5: Summary of Engagement – La Nation Huronne-Wendat**

Area of concern or Interest	Integrated Project team’s (IPT) response
<b>Registry Comments</b>	
<p>The Government of Canada is obliged to consult Indigenous people, and thus our Nation, on the whole of Nionwentsiö, when projects are likely to have an effect on our rights and interests.</p>	<p>The IPT is committed to strengthening partnerships with Indigenous communities and advancing reconciliation efforts.</p> <p>The engagement of Indigenous peoples is key to the project. Indigenous knowledge will be sought out, respected and honoured and will be given the same consideration as scientific knowledge brought forward by the IPT and its external experts.</p>
<p>The Alexandra Bridge is located west of the Nionwentsiö, the customary territory of the Huron-Wendat Nation attached to the Huron-British Treaty of 1760, but located on the ancestral territory of the Nation in Ontario, called Wendake South. The project is therefore likely to have impacts on the rights, activities and interests of the Nation. The Nionwentsiö Office is very interested in the Agency's environmental assessment process and wishes to be involved in all the upcoming steps.</p>	<p>The IPT has initiated engagement with Indigenous communities to determine if they wish to participate in this Project, in the impact assessment process for the Project, and in the studies that inform the Impact assessment process.</p> <p>The IPT looks forward to working with interested Indigenous communities as part of the engagement process to incorporate Indigenous Knowledge to the baseline information used in the assessment of potential biophysical impacts that will help to shape proposed mitigation, enhancement measures and compensation measures, if required.</p>

Area of concern or Interest	Integrated Project team's (IPT) response
<p>La Nation Huronne-Wendat wishes to pursue discussions and deepen the relationship with the project proponent. A consultation plan must be developed and funding must be made available to ensure the capacity of the Nionwentsio Office to actively and effectively participate in the various stages of the environmental assessment and the project.</p>	<p>The IPT is now working directly with staff of the First Nation on a Collaboration Agreement, a work plan and a budget to support the FN's participation in the engagement.</p>
<p>La Nation Huronne-Wendat is particularly interested in impacts of the project on cultural heritage, especially on our archaeological heritage. We would like to view and comment on the studies that have already been completed, as well as participate in the development of studies to come. For example, the archaeological potential map shows that the Alexandra Bridge area has a low archaeological potential. We wish to have access to this data and have the opportunity to supplement it with our own data and studies as needed.</p>	<p>Additional studies are anticipated to be required to complete the construction planning. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed.</p> <p>The nature of participation will be determined by the Indigenous communities themselves, including:</p> <ul style="list-style-type: none"> <li>• Reviewing draft Terms of References for studies</li> <li>• leading studies with financial support from the IPT and providing the results to the IPT.</li> <li>• participating in parallel with the work of external experts hired by the IPT.</li> <li>• Reviewing the results of studies undertaken under the direction of the IPT and providing comments and guidance.</li> </ul>
<p>Archaeological intervention planned within the framework of this project must be carried out in the presence of a representative of the Nation. Several times in the document, it is mentioned that the archaeological resources will be managed in collaboration with the Algonquin people and in accordance with the Archaeological Resource Co-Management Protocol. Although this type of protocol does not exist with all communities, a specification should be made that all interested Aboriginal communities, including the Huron-Wendat Nation, should be involved in these collaborative archaeological operations.</p>	<p>The IPT acknowledges the interest of la Nation Huronne-Wendat in having a representative present during archaeological field work. The IPT will work with interested Indigenous communities to provide opportunities for meaningful engagement.</p>
<p>The question of economic development is an important issue for la Nation Huronne-Wendat, since we wish to benefit from the positive spinoffs of project development on the territory, particularly at the economic level. To this effect, discussions must continue between the proponent, the Nionwentsio Office and the Economic Development and Major Projects Directorate of the Nation in order to be able to carry out certain contracts related to the construction of this bridge.</p>	<p>The IPT is committed to ongoing discussions on economic development with Indigenous communities.</p>

Area of concern or Interest	Integrated Project team's (IPT) response
<p>The proponent seems to give an important place to the Indigenous Participation Plans that will have to be developed by the bidders.</p> <p>The Nation would like the opportunity to comment on the specific criteria that are developed to guide the development of these plans.</p> <p>It is also important that the successful contractor be accountable to the proponent and the First Nations for the implementation of the participation plan. A meeting on the engagement plans between the proponent and the Nionwentsio Office is planned in the near future and should shed light on these issues.</p>	<p>Indigenous Participation Plans are being required of all contracts associated with the Project, with the goal of matching each community's skills and proficiencies with the Project requirements. The IPT will address training and development needs that are identified by the community. The Indigenous Participation Plans can also be used to support innovative measures identified by the community, such as bursaries for students.</p> <p>The design and criteria of Indigenous Participation Plans will be the subject of further discussions between the IPT and Indigenous communities.</p>
<p>Collaboration between the proponent and the Nionwentsio Office will be required to evaluate the potential impacts of the project on the contemporary activities of the Nation. The Office of Nionwentsio is the only one to have the expertise to determine the impacts of a project on the rights, activities and interests of the Nation. Studies conducted by the Office of Nionwentsio at the expense of the proponent may be required to properly assess these impacts.</p>	<p>Additional studies are anticipated to be required to complete the construction planning. The IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed.</p>
<p>The Nionwentsio Office also has the expertise required to carry out various follow-up and biological studies. Discussions will therefore have to take place with the proponent to ensure the participation of la Nation Huronne-Wendat in the various environmental studies that will be carried out as part of the project.</p>	<p>The IPT is working in several ways to support the economic participation of community members and businesses.</p> <p>The IPT will discuss opportunities related to the studies for the biophysical characterization of the Project area that will be needed to support planning and design steps.</p>
<p>Finally, we wish to clarify the information on la Nation Huronne-Wendat. There is only one Huron-Wendat community, it is Wendake.</p>	<p>Corrected in the document.</p>

### 19.3.9 Summary of Engagement – Le Conseil de la Première Nation Abitibiwinni

In initial discussions, the Nation expressed interest in economic opportunities. Le Conseil de la Première Nation Abitibiwinni indicated a strong interest in economic participation through a community-owned construction company and are working closely with PSPC on procurement opportunities. They are also keen on skills development for the longer term and will be submitting a plan for training and development. The IPT will work with the Nation on an Indigenous Participation Plan to ensure economic opportunities are available.

### 19.3.10 Summary of Engagement – Le Conseil des Anicinapek de Kitcisakik

The IPT has held discussions with Le Conseil des Anicinapek de Kitcisakik. They raised concerns about the quality of the environment within the Ottawa River watershed. As part of the Project, the IPT will

consider habitat creation, restoration and other offsetting measures to achieve positive net environmental benefits over the long-term. The community has also raised an interest in economic and training opportunities that will be discussed at future meetings.

### **19.3.11 Summary of Engagement – Long Point First Nation**

The IPT has made efforts to discuss the project with the Long Point First Nation. No issues were identified yet, but the IPT will continue to communicate with the Nation. Funding support for participation will be available as required.

### **19.3.12 Summary of Engagement – Métis Nation of Ontario**

The IPT has introduced the Project to the Métis Nation of Ontario. No issues were identified yet, but the IPT will continue to communicate with the Nation. Funding support for participation will be available as required.

### **19.3.13 Summary of Engagement – The Algonquins of Barriere Lake**

The IPT has made efforts to discuss the project with the Algonquins of Barriere Lake. No issues were identified yet, but the IPT will continue to communicate with the Nation. Funding support for participation will be available as required.

### **19.3.14 Summary of Engagement – The Mohawk Council of Akwesasne**

The IPT has made efforts to discuss the project with the Mohawk Council of Akwesasne. No issues were identified yet, but the IPT will continue to communicate with the Council. Funding support for participation will be available as required.

### **19.3.15 Summary of Engagement – The Mohawk Council of Kahnawake**

The IPT has made efforts to discuss the project with the Mohawk Council of Kahnawake. No issues were identified yet, but the IPT will continue to communicate with the Council. Funding support for participation will be available as required.

### **19.3.16 Summary of Engagement – The Mohawk Council of Kanesatake**

The IPT has made efforts to discuss the project with the Mohawk Council of Kanesatake. No issues were identified yet, but the IPT will continue to communicate with the Council. Funding support for participation will be available as required.

## 19.3.17 Summary of Engagement – Timiskaming First Nation

**Table 19-6: Summary of Engagement – Timiskaming First Nation**

Area of concern or Interest	Integrated Project team's (IPT) response
<b>Registry Comments</b>	
<p>We are concerned with the long-lasting work within the waters and disturbance to the surrounding fish, wildlife and habitat. The impacts that cannot be mitigated, such as the loss of riparian zones, harbour species at risk plants, could have devastating effect to the rights of indigenous people and to the ecosystem. With the deconstruction of the bridge, loss of bat roosting habitat will be lost, With the research and field work at TFN we have noticed a lot of bridges are being used by bats as day night roosts. TFN is also concerned with the noise over such a long period of time, could also have additional disturbance to fish and wildlife.</p>	<p>Vegetation and wildlife surveys, including for species at risk, will be undertaken within the Project area to confirm the presence of species at risk and provide baseline information required to fully assess the potential impacts of the Project. Survey timing windows will be modified to include the migration and overwintering seasons. The results of these surveys will potentially influence the bridge design and methods of construction, which will be developed in the design stages of the Project. This information is in turn required to determine the detailed potential effects of the Project on fish, birds, bats and other animals, as well as to develop a management approach to protect these animals. The detailed effects and mitigation measures will inform the construction methods of the bridge.</p>
<p>Furthermore, the cumulative effects of hydro dams, log drives, and various industrial development has changed the water ways and passage drastically. Constant disturbance has environmental effects.</p>	<p>Additional discussions will be needed to understand the cumulative effects of concern. When more details are available at the bridge design stage, residual impacts on Valued Components (VCs) that may contribute incrementally to existing cumulative effects will be confirmed and evaluated.</p> <p>The spatial boundaries for the cumulative assessment on valued components of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in the existing characteristics of the valued component.</p>
<p>Cultural Landscape includes the overall heritage of the bridge but for TFN, we see the Ottawa River as a historical site for Algonquin people as a travel route. In the creation of reserves, indigenous people were kept idle and the Ottawa River travel route was guarded by mercenaries. Although, we no longer travel in canoes and are now in cars, we see that a project in this site has the opportunity to bridge Algonquins to the city of Ottawa and its residents. Decisions should include the Algonquin people in any way possible, and could mean changing the name of the bridge to reflect our history.</p>	<p>The IPT welcomes the engagement of the Timiskaming First Nation in this project and looks forward to future engagement on how to include Algonquin people in the new bridge project.</p> <p>The IPT will provide opportunities for Indigenous communities to contribute Indigenous Knowledge to inform the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural</p>

Area of concern or Interest	Integrated Project team's (IPT) response
<p>A big part of TFN is harvesting berries, plants, mushroom species. The potential to riparian zone loss of the during dewatering will make these species not present to harvest. A good example species is high bush cranberry (<i>Viburnum Trilobum</i>) which is harvest frequently by TFN members. With these riparian zones being altered, the buffer they form to protect the water's edge will be affected. We are also concerned about the fish and fish habitat, as it is a staple in our culture. The developments all contribute to loss of traditional land use and have deterred First Nations from gathering in that area. Although, there are still some ceremonies conducted, travel routes and traditional land use there, will continue to be impacted.</p>	<p>heritage to contribute to the evaluation of alternative alignments.</p> <p>Additional studies are anticipated to be required to complete the construction planning. During this stage of the Project, the IPT will engage Indigenous communities to contribute Indigenous Knowledge, identify concerns and determine appropriate studies needed to support the Project assessment.</p> <p>An update of the desktop review will be completed in winter 2022/spring 2023. The review will gather additional information published since the preliminary work for the development of the Initial Project Description was completed. This work will provide an opportunity to engage with Indigenous communities to gather knowledge from available reports, maps or any other source materials (that are acceptable to be shared) that may hold Indigenous Knowledge to contribute to the assessment of potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.</p> <p>The additional information, including Indigenous Knowledge gathered in the desktop review, will contribute to a more detailed understanding of data gaps that require further investigation to evaluate potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage the Project may have.</p>
<p>In TFN, we know there are aboriginal artifacts scattered everywhere in the territory from over 2000 years of travel on the land. Knowing this, it is very important to do an archeological survey of the de-watered and areas being disturbed, in the proposed work site.</p>	<p>The IPT is committed to following the established protocol. A protocol between the NCC, Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation was signed on August 22, 2012, and updated on March 13, 2017. The protocol provides a framework for the engagement of Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation in all stages of archaeological investigations undertaken on NCC land. It ensures that Kitigan Zibi Anishinabeg First Nation and the Algonquins of Pikwakanagan First Nation are fully informed of such investigations and fully involved in the decision-making process regarding the co-management of archaeological resources discovered through investigations or construction and development work.</p>
<p>Overall, our initial comments for social conditions would entail a holistic approach around the history of First Nations peoples. Cumulative effects on the</p>	<p>The IPT is committed to working with Indigenous communities to collect and validate information on physical and cultural heritage and values to contribute</p>





Area of concern or Interest	Integrated Project team's (IPT) response
<p>environment but also, residential schools, sixties scoop, the Indian Act, the lack of basic right to clean drinking water, are all ways that communities have been impacted negatively. This bridge was built in the time that communities were being shuffled to reservations. Now, in the bridge's state of repair, we should look at how First Nations can be impacted positively. Here is an opportunity to unite our nations again, make a gathering and a find First Nation specific practices site for the bridge and/or surrounding site. With the site being altered, the loss of gatherings, and traditional land use like harvesting of said species, and fishing the areas, members will miss out on social experiences with one another which lead to decline in mental health.</p>	<p>to the design of the new bridge and achievement of the vision of creating a bridge reflective of Canadian values and identity.</p>
<p>At this time, we do not have a point of reference in the health conditions. The connection to "social conditions" could lead to poor mental health such as the loss of wild foods or impacts to the environment.</p>	<p>Noted.</p>
<p>TFN Programs such as Ni dakinan's, The Wild Basket, employ community members to harvest traditional plants, berries, and mushrooms and offer them to the local region. TFN sees potential to affect any species in the area.</p>	<p>The IPT will work with Indigenous communities to plan the scope and nature of studies of traditional plants to be conducted as part of the Project. The IPT is committed to discussions with Indigenous communities about the identification, planning and design of land and river infrastructure improvements as part of the Project.</p>
<p>TFN also wants to explore the potential to benefit community members by way of capacity building or business opportunities.</p>	<p>The procurement process for the Project will require bidders to submit Indigenous Participation Plans that increase access to employment, contracting, training and apprenticeships.</p> <p>Indigenous Participation Plans will attempt to match each community's skills and proficiencies with the Project requirements. The IPT will address training and development needs that are identified by the community. The Indigenous Participation Plans can also be used to support innovative measures identified by the community, such as bursaries for students.</p> <p>The design and criteria of Indigenous Participation Plans will be the subject of further discussions between the IPT and Indigenous communities.</p>
<p>The project is expected to impact the exercise of TFN's rights on the basis that the project is on Algonquin territory with inherent rights. TFN will reserve comments in the initial project description.</p>	<p>Noted.</p>
<p><b>How you would like the proponent to engage your community.</b></p>	<p>Noted. The IPT is committed to working with Indigenous communities at their pace to establish</p>



Area of concern or Interest	Integrated Project team's (IPT) response
<p>e-mail relevant documents, presentations and notices in timely manner  community summary docs,  conduct Follow ups  sufficient funding and timelines to review and assess work collaboratively when possible  allow extensions when requested  set expectations for proponent's duty to consult  duty to consult with respect,  meaningful dialogue-accommodate where possible</p>	<p>agreements, provide funding to support participation in engagement, and increase the level of consultation as required.</p>
<p>IPD-Preliminary comments:  TFN would like wording in the project description that it is located on Algonquin Territory lands.</p>	<p>The IPT has include text to recognize the location of the Project:</p> <p><i>PSPC and the NCC understand that the Project area is within the traditional territory of the Algonquin Nation. The Ottawa River is an area of special significance for Indigenous Peoples who have relied on this natural highway for generations for the provision of food and water, for transport throughout traditional territories, and for commerce with others passing through the area.</i></p>
<p>Additional Comment:  TFN would like more information around de-watering and the coffer dam.  During the De-watering stage, it's a race to save fish and mollusk species. TFN would like a mitigation effort to invite communities to help put these species back into the water. Communities could also harvest the deceased individuals for consumption, and crafts.  General questions.  What is done with the diseased individuals after the de watering process?  What is done with the dead fish?  What is done with the dead mollusks?  What is done with the dead Odonata spp. And other benthic invertebrates?  What is done with dead vegetation?  And what is done with all other organic/biota mortality</p>	<p>The IPT is committed to understanding the effects of the Project on fish and fish habitat before beginning construction, including coffer dams and de-watering. The IPT will work with the Timiskaming First Nation and other interested Indigenous communities to discuss opportunities for engagement in the rescue process.</p> <p>The details requested are not available at this stage of the Project. The questions are noted, and answers will be provided as details become available. The IPT will follow conditions of authorization by authorities such as DFO and general best practices in similar projects in planning rescue initiatives. Plans will be shared with interested Indigenous communities to provide opportunities for engagement in the rescue activities.</p>
<p>TFN asked the question if the design will remain the same due to the heritage of the bridge.</p>	<p>The IPT will provide opportunities for Indigenous communities to contribute Indigenous Knowledge to inform the design of the replacement bridge including evaluation of alternative alignments. In addition, the IPT will engage with Indigenous communities to identify potential impacts to physical and cultural heritage to contribute to the evaluation of alternative alignments.</p>

Area of concern or Interest	Integrated Project team's (IPT) response
<p>What type of chemicals will be used for dust and where and when will it be used?</p>	<p>The IPT expects that construction specifications for the project will require the contractor to submit a Dust Management Strategy and Air Pollution Control Plan. The strategy will show how dust generated from construction activities will be mitigated and address such issues as weather events. Minimizing dust may also require specifying the use of power tools with effective dust collection systems to collect spent material.</p> <p>Dust will also be managed through the contractor's Erosion and Sediment Control Plan. Limiting soil erosion and the discharge of soil-bearing water is an important dust-control measure.</p> <p>Water may be used for dust suppression. Amendments such as calcium chloride may be used in accordance with any limitations laid out in plans for working near water as part of a potential Fisheries Act approval for the project.</p>
<p>Which green spaces will be closed for construction use?</p>	<p>The IPT acknowledges the concern for continued access to the green spaces in the vicinity of the Project and will include it for consideration in planning construction related activities (detours, traffic management and others). Plans will be shared with Indigenous communities as part of the engagement process.</p> <p>Review of lands required for staging during deconstruction and construction will occur as part of the design phases. Plans will include appropriate mitigation and reinstatement measures to protect capital parks, greenspaces and shorelines.</p>
<p>TFN is interested in knowing which tourism and businesses will be impacted?</p>	<p>In collaboration with PSPC, the NCC has identified and developed a list of 650+ stakeholder communities at the local, regional and national level who may be affected by or have an interest in the Project. The IPT will also be creating smaller targeted outreach opportunities with major institutions, commercial operators, client communities, and stakeholders in the immediate vicinity of the proposed Project to ensure that impacts from all aspects of the Project are understood and addressed to the extent possible.</p> <p>A list of businesses and other communities being consulted is presented in <a href="#">Appendix A</a>.</p>
<p>Are there local fisherman that use that area?</p>	<p>The details requested are not available at this stage of the Project. The presence of a diverse fish community in the Ottawa River suggests that recreational fishing</p>

Area of concern or Interest	Integrated Project team's (IPT) response
	<p>may take place in the area. There is a mix of cold and warm water fish species, with over 85 fish species recorded from its waters (MNR &amp; MFFP, 2018). Fish species include important sportfish, such as Walleye (<i>Sander vitreus</i>), Muskellunge (<i>Esox masquinongy</i>), Largemouth Bass (<i>Micropterus salmoides</i>), Smallmouth Bass (<i>Micropterus dolomieu</i>), Sauger (<i>Sander canadense</i>) and Northern Pike (<i>Esox Lucius</i>). Species at risk such as Lake Sturgeon (<i>Acipenser fulvescens</i>), American Eel (<i>Anguilla rostrata</i>) and River Redhorse (<i>Moxostoma carinatum</i>) are also known to be present in the river.</p> <p>There are several bays along the edges of the river both upstream and downstream of the Project that provide excellent opportunities for recreational fishing.</p>
<b>What We Heard Through Consultation</b>	
Opportunity for recent graduates and other young people to find work in the National Capital Area	PSPC and the NCC will work with the First Nation to help match its young members with employment and training in the private sector and the Government of Canada.
The historical impacts of structures built on and beside the Ottawa River must be considered in terms of the long-term impacts on the heritage of Algonquin peoples.	Indigenous communities will be engaged in the identification of impacts and residual impacts related to access to the area associated with the Project as well as the planning and design of appropriate mitigation and enhancement measures.
Involvement in reviewing terms of reference for project studies	The IPT will provide the opportunities for Indigenous communities to participate in the development of terms of reference for studies.
Environmental studies should include a cumulative effects study, historical use of the Ottawa River and effects, and where and how the next seven generations will be affected.	<p>Additional discussions will be needed to understand the cumulative effects of concern. When more details are available at the bridge design stage, residual impacts on Valued Components (VCs) that may contribute incrementally to existing cumulative effects will be confirmed and evaluated.</p> <p>The spatial boundaries for the cumulative assessment on valued components of interest will be established in collaboration with Indigenous communities to determine if the residual effects of the Project after the application of mitigation, may, in combination with others, cause a significant change now or in the future in the existing characteristics of the valued component.</p>
The First Nation will be involved in establishing protocols to review the terms of reference for studies	The IPT looks forward to working with Indigenous communities as part of the engagement process to incorporate Indigenous Knowledge to the baseline

Area of concern or Interest	Integrated Project team's (IPT) response
and for Timiskaming First Nation's participation in the studies. Species studies are of particular importance.	information used in the assessment of potential biophysical impacts as well as impacts to Indigenous physical and cultural heritage.

### 19.3.18 Summary of Engagement – Wahgoshig First Nation

In initial discussions, Wahgoshig First Nation indicated that they would like to create a workplan and budget to support their participation. Work can begin at the First Nation's convenience. Funding is available from PSPC and the NCC for this purpose. The IPT will continue to communicate with the First Nation on this and other issues.

### 19.3.19 Summary of Engagement – Wolf Lake First Nation

The IPT has discussed the Project with the Wolf Lake First Nation, which requested financial support for engagement. The IPT has offered funds to support participation and the hiring of external experts.



## 20 ESTIMATED GREENHOUSE GAS EMISSIONS

Stantec consulting Ltd. was retained to complete a planning stage estimate of greenhouse gas (GHG) emissions. This estimate follows the guidance provided in “Strategic Assessment of Climate Change” (ECCC 2020) (referred to as the Guidance). The GHGs included in this assessment are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), grouped and reported as total carbon dioxide equivalents (CO<sub>2</sub>e) (using the Global Warming Potential (GWP) of 1, 25, 298 for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, respectively). Other GHGs, i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>), are not included because the applicable emission sources (related to fossil fuel combustion) do not release those gases.

The geographical boundary for this GHG emission estimate is described in Sections 14.1 and 0. The temporal boundary is related to the increase in GHG emissions due to the Project from existing GHG emissions regionally and globally.

The net GHG emissions were estimated using the following equation as per the Guidance:

- *Net GHG emissions = Direct GHG emissions + Acquired energy GHG emissions - CO<sub>2</sub> captured and stored - Avoided domestic GHG emissions - Offset credits*

*Note: Under direction from the Treasury Board of Canada, the offset credits in the calculation above are strategically purchased at the portfolio level, rather than for each individual Project.*

The direct GHG emissions are those associated with direct fuel combustion which occurs in construction and operation stages of the Project.

The acquired energy GHG emissions are emissions associated with electricity or steam consumption during the Project. Project specific information is not available at this stage. Further, it is unlikely for the Project to have steam consumption or external electricity consumption. The electricity usage onsite would be obtained through portable generators where fuel consumption would be accounted for under direct GHG emissions. Thus, the acquired energy GHG emissions are assumed to be negligible and not considered further in this planning stage estimate.

There is no Project specific information available on CO<sub>2</sub> captured and stored, avoided domestic GHG emissions, and offset credits at this stage of the Project. Therefore, those terms were assumed to be zero for this planning stage estimate.

As per the above assumptions, net GHG emissions is therefore equal to the direct GHG emissions.

A high-level estimate of the upstream GHG emissions associated with production of materials used in typical major bridge construction as well as the production of fuels used in construction and operation is also provided. A GHG emissions estimation for the construction and operation stages will be revised, as Project design progresses. Estimation was organized according to “scope streams”, as per the GHG Protocol developed by the World Resources Institute. As such, Scope 1 emissions include direct emissions from the activities, including fuel combustion on site. Scope 2 emissions include indirect emissions from grid electricity purchased and used for the Project. Scope 3 emissions include other

indirect emissions occurring from sources that the IPT does not own or control, such as construction material production and fuel production.

The Greening Government Strategy (GGS) requires that the embodied carbon in the structural materials used in major construction projects be disclosed by 2022. The requirement corresponds to Scope 3 emissions associated with the extraction of raw materials, transportation of raw materials and manufacturing of structural materials. Furthermore, the GGS requires that the embodied carbon from structural materials in major construction projects be reduced by 30%, starting in 2025. Finally, the GGS requires that whole building life-cycle assessments be done for major infrastructure projects by 2025. These GGS requirements will be taken into account in the Alexandra Bridge project as it progresses.

## 20.1 Construction and Deconstruction Stages

During the construction stage of the Project, there will be a release of GHGs to the atmosphere associated with fuel combustion in heavy/construction equipment, off-road mobile equipment, and on-road vehicles used. This section provides the estimate of GHGs for the following activities:

- Deconstruction of the old bridge and construction of the new bridge the GHG emissions are from the use of heavy/construction equipment, generators, and off-road equipment
- Transportation of old bridge debris for disposal the GHG emissions are from on-road truck and trailers used to transport the debris to disposal locations
- Transportation of construction materials for the new bridge the GHG emissions are from on-road trucks/trailers used to transport construction materials from manufacturers to the construction site
- Worker transportation: the GHG emissions associated with on-road vehicles used for workers' commute to and from Project location during bridge deconstruction /construction activities

The following activities are currently not included in this GHG estimate because information was not available during this assessment.

- Emissions associated with traffic delays/disruption and road detour due to construction/deconstruction activities.
- GHG emissions related to transportation of heavy/construction equipment to site for bridge deconstruction and construction.
- Specific details pertaining to on and off-road vehicles, as these estimates were made based on previous studies.

These activities will be incorporated in the GHG assessment once Project specific information is available.

### 20.1.1 Scope 1 – Direct Fossil Fuel Emissions – Bridge Deconstruction /Construction

Since the Project/site specific data are currently not available, a high-level estimate of GHG emissions for this Project's bridge deconstruction and construction was derived from the average emissions per

bridge area m<sup>2</sup>) from 4 previous studies on bridge construction and operation. The average emission intensity (tCO<sub>2</sub>e/m<sup>2</sup>) was then applied to the existing Alexandra Bridge area. The four studies include:

1. Madawaska/Edmundston International Bridge Replacement Project (New Brunswick Department of Transportation and Infrastructure, 2018)
2. Baudette/Rainy River International Bridge Replacement Project (Stantec, 2017)
3. Tappan Zee Hudson River Crossing Project (U.S. Federal Highway Administration, 2012)
4. 5<sup>th</sup> Street Bridge Replacement Project (Dokken Engineering, 2011)

The GHG emissions were estimated to be 13,938 tCO<sub>2</sub>e for the bridge deconstruction and 22,025 tCO<sub>2</sub>e for the bridge construction.

The following assumptions were made:

- The specific bridge design(s) or configuration(s) are not factored in this estimate.
- Emissions associated with deconstruction of the old bridge were derived from the Baudette/Rainy River Bridge study only as other studies do not clearly identify emissions from bridge deconstruction.
- The Tappan Zee Hudson River Bridge study presented several cases. The construction emissions estimate from Tappan Zee Hudson River Bridge study was taken from Short Span design case because it is the most conservative. Further, the upstream emissions from the Tappan Zee study for materials and worker transportation were excluded because they are estimated separately for the Alexandra Bridge.



The example calculation is provided below.

Example calculation:

$$\begin{aligned} & \text{Deconstruction Emissions } -tCO_2e \\ & = \text{Demolition Emission Intensity} \left( \frac{tCO_2e}{m^2} \right) \times \text{Alexandra Bridge Area } (m^2) \end{aligned}$$

$$\text{Deconstruction Emissions } (tCO_2e) = 1.31 \left( \frac{tCO_2e}{m^2} \right) \times 10,640 (m^2) = 13,938 (tCO_2e)$$

Where,

Deconstruction Emission Intensity is from the Baudette/Rainy River Bridge study only due to limited information as noted above.

$$\begin{aligned} & \text{Construction Emissions } (tCO_2e) \\ & = \text{Construction Emission Intensity} \left( \frac{tCO_2e}{m^2} \right) \times \text{Alexandra Bridge Area } (m^2) \end{aligned}$$

$$\text{Construction Emissions } (tCO_2e) = 2.07 \left( \frac{tCO_2e}{m^2} \right) \times 10,640 (m^2) = 22,025 (tCO_2e)$$

Where,

Construction Emission Intensity is from the average of the above four studies.

There is a high level of uncertainty for this GHG estimate because Project/site specific information was not available at the time of the estimate. Fuel usage for activities such as land clearing, site preparation, and landscaping are site specific in nature and generally independent of a size of bridge being constructed therefore, emissions intensity in the other Projects varied widely. The Project specific GHG assessment will consider the detailed design when site specific data are available (e.g., if the replacement of the bridge involves new areas that may require vegetation clearing and/or land use change, it will be factored in GHG emissions assessment). However, tree removal will be reduced. Any tree to be removed will be compensated by replanting at a minimum ratio of 2:1.

### 20.1.2 Scope 1 – Direct Fossil Fuel Emissions – Transportation of Debris for Disposal

The GHG emissions for transport of debris are associated with fuel consumption in trucks/trailers used for transporting debris from deconstruction of the old bridge to disposal/recycling locations. The emissions were estimated using published emission factors for on-road mobile vehicles (ECCC, 2020d) and estimated distance travelled.

The estimated GHG emissions from transportation of debris for disposal were 46.5 tCO<sub>2</sub>e. The example calculation is provided below.

Example calculation:

$$\begin{aligned} \text{Emissions (tCO}_2\text{e)} &= \text{Diesel Consumption (L)} \times \text{EF}_{\text{HDDVs}} \left( \frac{\text{tCO}_2\text{e}}{\text{L}} \right) \\ \text{Emissions (tCO}_2\text{e)} &= 17,040 \text{ (L)} \times 0.002729 \left( \frac{\text{tCO}_2\text{e}}{\text{L}} \right) = 46.5 \text{ (tCO}_2\text{e)} \end{aligned}$$

Where,

Estimated debris was 6,916 tonnes of steel and 1,596 tonnes of cement concrete therefore, there are 426 round-trips for debris disposal, with 100 km per a round-trip. Total distance driven is 42,600 km.

Total diesel consumption = Truck fuel efficiency (40 L/100km) \* 42,600 km = 17,040 L

The EF<sub>HDDVs</sub> is the emission factor for Heavy-duty Diesel Vehicles (HDDVs) - Advanced Control, derived from CO<sub>2</sub> emission factor of 2681 g/L, CH<sub>4</sub> emission factor of 0.11 g/L, and N<sub>2</sub>O emission factor of 0.151 g/L (ECCC, 2020d) and GWPs.

The following assumptions were made:

- Amount of debris was calculated using the existing Alexandra Bridge's dimension and typical materials for major steel bridge (with an average span of 125 m) was assumed (World Bank 2011) this is assumed because Project specific information is not available at the time of the assessment
- The average commercial transport fuel efficiency of 40 L/100 km was applied to all trucks for material transport
- The Heavy-duty Diesel Vehicles (HDDVs) - Advanced Control emission factors were applied to all trucks
- Debris can be disposed/recycled locally within 50 km one way (100 km per trip)
- A dump truck has a carrying capacity of 20 tonnes per trip<sup>4</sup>

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<sup>4</sup> based on a typical 18-wheel, semi-tractor trailer carrying capacity in Canada/US (<https://www.tcsfuel.com/blog/truck-weight-classification/#:~:text=A%20semi%2Dtruck%20hooked%20up,pounds%2C%20depending%20on%20the%20size>) and Task Force on Vehicle Weights and Dimensions Policy, Heavy Truck Weight and Dimension Limits for Interprovincial Operations in Canada, December 2016

### 20.1.3 Scope 1 – Direct Fossil Fuel Emissions – Transportation of Construction Materials

The GHG emissions associated with fuel consumption in trucks/trailers used for transporting construction materials from manufacturing locations to the construction site were estimated to be 139.5 tCO<sub>2</sub>e. The emissions were estimated using the same method as described above. The example calculation is provided below.

Example calculation:

$$\begin{aligned} \text{Emissions (tCO}_2\text{e)} &= \text{Diesel Consumption (L)} \times \text{EF}_{\text{HDDVs}} \left( \frac{\text{tCO}_2\text{e}}{\text{L}} \right) \\ \text{Emissions (tCO}_2\text{e)} &= 51,120 \text{ (L)} \times 0.002729 \left( \frac{\text{tCO}_2\text{e}}{\text{L}} \right) = 139.5 \text{ (tCO}_2\text{e)} \end{aligned}$$

Where,

Total distance driven is 127,800 km, estimated from 426 round-trips for material transport, with 300 km per round-trip.

Total diesel consumption = Truck fuel efficiency (40 L/100km) \* 127,800 km = 51,120 L

The EF<sub>HDDVs</sub> is the emission factor for Heavy-duty Diesel Vehicles (HDDVs) - Advanced Control, as shown above.

The following assumptions were made:

- Amount of materials were calculated using the existing Alexandra Bridge's dimension and typical materials for major steel bridge (with an average span of 125 m) was assumed (World Bank 2011). This is because the design of the new bridge is currently not available.
- The average commercial transport fuel efficiency of 40 L/100 km was applied to all trucks for material transport.
- The Heavy-duty Diesel Vehicles (HDDVs) - Advanced Control emission factors were applied to all trucks.
- Construction materials can be obtained within 150 km one way (300 km per trip).
- Only truck/trailers were used as a mean for transportation and marine/barge was not used.
- A transport truck/trailer has a carrying capacity of 20 tonnes per trip.

## 20.1.4 Scope 1 – Direct Fossil Fuel Emissions – Worker Transportation

The GHG emissions are related to fuel consumption in on-road vehicles for worker transportation to/from site. The emissions were estimated to be 2,825 tCO<sub>2</sub>e, based on published emission factors for on-road mobile vehicles (ECCC, 2020d) and estimated distance travelled. The example calculation is provided below.

Example calculation:

$$\begin{aligned} \text{Emissions (tCO}_2\text{e)} &= \text{Gasoline Consumption (L)} \times \text{EF}_{\text{LDGVs}} \left( \frac{\text{tCO}_2\text{e}}{\text{L}} \right) \\ \text{Emissions (tCO}_2\text{e)} &= 1,125,600 \text{ (L)} \times 0.00251 \left( \frac{\text{tCO}_2\text{e}}{\text{L}} \right) = 2,825 \text{ (tCO}_2\text{e)} \end{aligned}$$

Where,

Total gasoline consumption = Pickup truck average fuel efficiency (13.4 L/100 km) \* 10,000 km/day \* 840 days = 1,125,600 L.

EF<sub>LDGVs</sub> is the emission factor for Light-duty Gasoline Vehicles (LDGVs) – Tier 0, derived from CO<sub>2</sub> emission factor of 2307 g/L, CH<sub>4</sub> emission factor of 0.32 g/L, and N<sub>2</sub>O emission factor of 0.66 g/L (ECCC, 2020d) and GWPs.

The following assumptions were made:

- Vehicles are assumed to be Light-duty Gasoline Vehicles (LDGVs), e.g., a pickup truck.
- An average fuel efficiency from 4x4 Ford F-150 and 4x4 Ford F-250 was used. The data are sourced from NRCAN 2020 Fuel Consumption Guide.
- The Light-duty Diesel Vehicles (LDGVs) - Tier 0 emission factors were applied to all personnel transportation trucks.
- Deconstruction of the old bridge is assumed to occur 7 days a week for 4 months.
- Construction of the new bridge is assumed to occur 7 days a week for 8 months of a year and the construction lasts for 3 years.
- There are 50 people/vehicles travel to/from site per day and 100 km one-way commute for each vehicle.

## 20.1.5 Scope 2 – Indirect Fossil Fuel Emissions from Grid Electricity Usage – Grid Electricity Usage during Deconstruction /Construction

As stated above, it is assumed that there would be no grid electricity usage during deconstruction and construction of the Alexandra Bridge because electricity would be obtained through portable generators, and the fuel consumption would be accounted for under direct GHG emissions (Section 20.1).

## 20.2 Operation Stage

During operation of the existing and new bridges, the bridge inspection, maintenance, and repair activities include, but not limited to, the following emission sources:

- Heavy equipment and fuel used in maintenance and repair work.
- Transportation of equipment and materials used in maintenance and repair work.
- Transportation of workers for inspection, maintenance, and repair work.
- Electricity consumption from grid for bridge and sign lighting.

The new Bridge would have a functional equivalent to the old Bridge, and it is assumed no substantial change to traffic volumes on the new Bridge (i.e., there would be net zero increase from transport emissions related to vehicles crossing the bridge).

### 20.2.1 Scope 1 – Direct Fossil Fuel Emissions – Bridge Inspection, Maintenance, and Repair

For bridge inspection, maintenance and repair (I&M), the GHG emissions are estimated to be 63 tCO<sub>2</sub>e/year from the following inspection and maintenance work, heavy equipment used, and staff/worker commute to/from the bridge.

**Table 20-1: Bridge inspection, maintenance and repair assumptions**

I&M Project Work	Heavy Equipment for I&M Work	Number of Staff for I&M Work (vehicles/day)	Duration of I&M Work (day/year)
<b>Annual cleaning</b>	2 Cleaning Trucks with Water Reservoir 1 Air Compressor	7	4
<b>Steel grating repair</b>	-	13	2
<b>Bearing bar repair</b>	-	13	8
<b>Weekly O&amp;M patrol (pot hole patching, graffiti removal, minor repair)</b>	1 Pressure washer	3	52
<b>Commissionaire patrol</b>	-	2	1
<b>Load test, Monthly</b>	1 Bako truck	3	12
<b>Annual inspection or Comprehensive Detailed Inspections (CDI)</b>	-	2	1

The following assumptions were made:

- All heavy equipment uses diesel fuel and operates 12 hours/day.
- All staff/worker vehicles are light duty gasoline vehicles (LDGV) and commuting 100 km, one-way to/from site.
- Insignificant bridge construction materials (e.g., steel, concrete) used in the maintenance and repair work.

The IPT expects that there is no major maintenance and repair work for the first 5 years of operation. In addition, the GHG emissions over the following 70 years are much smaller, compared to emissions from bridge construction. There would be zero increase of emission from the existing bridge based on the year of bridge operation and maintenance intervals/cycles. The emissions from the new bridge's operation will be re-assessed once Project specific information is available.

### **20.2.2 Scope 2 – Indirect Fossil Fuel Emissions from Grid Electricity Usage –for Lighting during Bridge Operation**

There will be electricity usage for bridge and sign lighting during the bridge operation. However, since it is assumed no substantial change to the length of the bridge, it is expected that no considerable increase for electricity usage compared to existing conditions. There could be a reduction in electricity usage if the new bridge design uses energy efficient lighting system or renewable energy (e.g., solar cells). This will be re-assessed once Project specific information is available.

## **20.3 Future Decommissioning of the New Bridge**

To estimate the GHG emissions for Decommissioning phase of the new bridge, the emissions were based on decommissioning of the existing bridge, which includes bridge deconstruction (based on literature review of similar projects), transportation of debris, and worker transportation activities. These emissions are associated with the combustion of diesel in heavy equipment and gasoline for worker transportation. The inputs to the emission calculation of the deconstruction associated with the proposed bridge were assumed to be identical emissions associated with the deconstruction of the existing bridge. The same methodologies and emission factors were used. Table 20-2 provides estimated emissions for decommissioning of the new bridge.

**Table 20-2: Estimated emissions for decommissioning of new bridge**

Phase	Sources/Activities	Total Emissions Increase (tCO <sub>2</sub> e)	Annual Emissions (tCO <sub>2</sub> e/year) *
<b>Decommissioning Phase</b>	deconstruction of new bridge - Heavy equipment	13,938	13,938
<b>Decommissioning Phase</b>	Transportation of debris for disposal (new bridge)	46.5	46.5
<b>Decommissioning Phase</b>	Worker transportation – deconstruction only (new bridge)	404	404
<b>Total</b>		<b>14,389</b>	<b>14,389</b>

\* Assumed that all activities for decommissioning occur in one year.

The inputs to the emission calculation of the deconstruction associated with the proposed bridge were assumed to be identical emissions associated with the deconstruction of the existing bridge. The following methodologies, emission factors, and assumptions were used in the emission estimation.

- Deconstruction of new bridge - Heavy equipment:
  - The specific bridge design(s) or configuration(s) are not factored in this estimate.
  - Emissions associated with deconstruction of the new bridge were derived from the Baudette/Rainy River Bridge International Bridge Replacement Project (Stantec 2017), using the emission intensity (tCO<sub>2</sub>e/m<sup>2</sup>) which was then applied to the existing Alexandra Bridge area to obtain the emission estimate.
- Transportation of debris for disposal (new bridge)
  - Amount of debris was calculated using the existing Alexandra Bridge’s dimension and typical materials for major steel bridge (with an average span of 125 m) was assumed (World Bank 2011) this is assumed because Project specific information is not available at the time of this preliminary assessment.
  - The average commercial transport fuel efficiency of 40 L/100 km was applied to all trucks for material transport.
  - The National Inventory Report (NIR) (ECCC, 2020d) Heavy-duty Diesel Vehicles (HDDVs) - Advanced Control emission factors were applied to all trucks (0.002729 tCO<sub>2</sub>e/L).
  - Debris can be disposed/recycled locally within 50 km one way (100 km per trip)
  - A dump truck has a carrying capacity of 20 tonnes per trip.
- Worker transportation – deconstruction only (new bridge).
  - Vehicles are assumed to be Light-duty Gasoline Vehicles (LDGVs), e.g., a pickup truck.
  - An average fuel efficiency from 4x4 Ford F-150 and 4x4 Ford F-250 was used. The data are sourced from NRCAN 2020 Fuel Consumption Guide.
  - The NIR Light-duty Diesel Vehicles (LDGVs) - Tier 0 emission factors were applied to all personnel transportation trucks (0.002729 tCO<sub>2</sub>e/L).
  - Deconstruction of the old bridge is assumed to occur 7 days a week for 4 months.
  - There are 50 people/vehicles travel to/from site per day and 100 km one-way commute for each vehicle.

## 20.4 Scope 1 – Direct Fossil Fuel Emissions – Total Direct GHG Emissions

Direct emission increase due to the Project (from construction, operation, and decommissioning) are summarized in the Table 20-3. Total estimated direct GHG emission increase is 53,363 tCO<sub>2</sub>e, which is the net GHG emissions. The annual direct emissions are also provided.

**Table 20-3: Estimated direct GHG emissions (Increase) and annual direct emissions due to the Project at planning stage**

Stage	Sources/Activities	Total Emissions (Increase) (tCO <sub>2</sub> e)	Annual Emissions (Increase) (tCO <sub>2</sub> e/year) **
<b>Construction</b>	Deconstruction of the old bridge	13,938	4,646
<b>Construction</b>	Construction of the new bridge	22,025	7,342
<b>Construction</b>	Transportation of debris for disposal (old bridge)	46.5	16
<b>Construction</b>	Transportation of construction materials (new bridge)	139.5	47
<b>Construction</b>	Worker transportation (deconstruction and construction)	2,825	942
<b>Operation</b>	Traffic crossing the new bridge*	0	0
<b>Operation</b>	Annual maintenance*	0**	63
<b>Decommission (new bridge)</b>	Deconstruction of new bridge - Heavy equipment	13,938	13,938
<b>Decommission (new bridge)</b>	Transportation of debris for disposal (new bridge)	46.5	46.5
<b>Decommission (new bridge)</b>	Worker transportation – Deconstruction only (new bridge)	404	404
<b>Total Direct Emissions</b>		<b>53,363</b>	<b>27,444</b>

\*assumed 3 years for construction Stage and 75 years for operation stage.

\*\* based on the assumption provided in Section 20.

The annual net GHG emissions (increase) for each phase can be present in each term of equation 1 (*Net GHG emissions = Direct GHG emissions + Acquired energy GHG emissions - CO<sub>2</sub> captured and stored - Avoided domestic GHG emissions - Offset credits*), are presented in Table 20-4.



**Table 20-4: Estimated annual net GHG emissions (increase) for each phase**

Phase	Net GHG emissions	Direct GHG emissions	Acquired energy GHG emissions	CO <sub>2</sub> captured and stored	Avoided domestic GHG emissions	Offset credits
<b>Deconstruction / Construction</b>	12,993	12,993	0	0	0	0
<b>Operation</b>	63	63	0	0	0	0
<b>Decommissioning</b>	14,389	14,389	0	0	0	0
<b>Total</b>	<b>27,444</b>	<b>27,444</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Note: Emissions presented are on annual basis.

The following assumptions were made:

- It is assumed that deconstruction / construction occurs in 3 years, operation occurs in 75 years, and decommissioning occurs in 1 year.
- No grid electricity usage during deconstruction/construction and decommissioning of the bridge because electricity would be obtained through portable generators, and the fuel consumption would be accounted for under direct GHG emissions.
- Grid electricity usage during the operation of the new bridge is assumed to be zero because the new bridge would have a functional equivalent to the old bridge.
- The CO<sub>2</sub> captured and stored, avoided domestic GHG emissions, and offset credits are assumed to be zero at this initial stage. Emissions from those categories will be estimated when more information becomes available.

## 20.5 Scope 2 – Indirect Fossil Fuel Emissions from Grid Electricity Usage – Total Indirect GHG Emissions

Indirect emission increase due to the Project (from construction and operation) are summarized in the Table 20-5. Total estimated indirect GHG emission increase is zero. The annual indirect emissions will be estimated once data are available.

**Table 20-5: Estimated indirect GHG emissions (Increase) and annual indirect emissions due to the Project at planning stage**

Stage	Sources/Activities	Total Emissions (Increase) (tCO <sub>2</sub> e) *	Annual Emissions (tCO <sub>2</sub> e/year)
<b>Construction</b>	Grid electricity usage during construction and deconstruction	0**	0**
<b>Operation</b>	Grid electricity usage for lighting during operation	0**	NA
<b>Total Indirect Emissions</b>		<b>0</b>	<b>NA</b>

\*assumed 3 years for construction stage and 75 years for operation stage.

\*\* based on the assumption provided in Sections 20.1 and 20.2.

NA: Data are not available at this stage.

## 20.6 Scope 3 – Other Emissions – Upstream Emissions

Upstream emissions were indirect GHG emissions associated with the following activities as per the Guidance:

- Production of materials used in bridge construction. The emissions were estimated based on published emission intensity (tCO<sub>2</sub>e per tonnes of material) from the World Bank (World Bank, 2011) and amount of materials used. The amount of materials was calculated using the existing Alexandra Bridge's dimension and typical materials for major steel bridge (with an average span of 125 m) was assumed (World Bank 2011) as the actual new bridge design is not available.

Production of fuels used in construction and operation stages of the Project. The quantification method is based on estimated fuel volumes and published emission factors (AEP, 2019), as shown in the example calculations below.

The estimated upstream emissions are presented in the Table 20-6.

**Table 20-6: Estimated upstream GHG emissions for the Project at planning stage**

Stage	Parameter	Emissions (tCO <sub>2</sub> e)
Construction	Construction Material Production	30,023
Construction and Operation	Fuel Production	5,818
Decommission	Fuel Production	2,148
<b>Total Upstream Emissions</b>		<b>37,989</b>

The example calculation is provided below.

*Emissions from Production of Steel (tCO<sub>2</sub>e)*

$$= \text{Amount of Steel (tonnes)} \times EF_{\text{steel production}} \left( \frac{\text{tCO}_2\text{e}}{\text{tonne}} \right)$$

$$\begin{aligned} \text{Emissions from Production of Steel (tCO}_2\text{e)} &= 6,916 \text{ (tonnes)} \times 4.081 \left( \frac{\text{tCO}_2\text{e}}{\text{tonne}} \right) \\ &= 28,224 \text{ (tCO}_2\text{e)} \end{aligned}$$

*Emissions from Production of Cement Concrete (tCO<sub>2</sub>e)*

$$= \text{Amount of Cement Concrete (tonnes)} \times EF_{\text{cement-concrete production}} \left( \frac{\text{tCO}_2\text{e}}{\text{tonne}} \right)$$

$$\begin{aligned} \text{Emissions from Production of Cement Concrete (tCO}_2\text{e)} &= 1,596 \text{ (tonnes)} \times 1.127 \left( \frac{\text{tCO}_2\text{e}}{\text{tonne}} \right) \\ &= 1,799 \text{ (tCO}_2\text{e)} \end{aligned}$$

*Emissions from Production of Diesel and Gasoline (tCO<sub>2</sub>e)*

$$= \text{Total Fuels (L) in all activities} \times EF_{\text{diesel-gasoline production}} \left( \frac{\text{tCO}_2\text{e}}{\text{L}} \right)$$

*Emissions from Production of Diesel and Gasoline (tCO<sub>2</sub>e)*

$$= 14,121,014 \text{ (L)} \times 4.12 \times 10^{-4} \left( \frac{\text{tCO}_2\text{e}}{\text{L}} \right) = 5,818 \text{ (tCO}_2\text{e)}$$

Where,

$EF_{\text{steel production}}$  and  $EF_{\text{cement-concrete production}}$  are emission intensities related to production of steel and cement concrete, respectively (World Bank, 2011)

$EF_{\text{diesel-gasoline production}}$  is the emission intensity from production of diesel and gasoline fuels, derived from CO<sub>2</sub> emission intensity of 0.138 kg/L, CH<sub>4</sub> emission intensity of 0.0109 kg/L, and N<sub>2</sub>O emission intensity of 0.000004 kg/L (AEP, 2019) and GWPs.

Liters of fuels in the calculation of fuel production emissions include fuels associated with all activities, i.e., deconstruction, construction, debris disposal, construction material transport, worker transportation, and bridge maintenance. It was estimated using total direct emissions (tCO<sub>2</sub>e) and diesel emission factor of 0.00276 tCO<sub>2</sub>e/L (assuming diesel fuels). For example, total liters = 38,974 tCO<sub>2</sub>e/0.00276 tCO<sub>2</sub>e/L = 14,121,014 L.

## 20.7 Comparison with Existing GHG Emissions

The GHG emissions due to the Project is assessed by comparing annual Project emissions with the existing annual total and transportation sector GHG emissions in Ontario, Quebec, Canada, and Global. The most recent data available for existing GHG emissions were used: 2018 data for Ontario, Quebec, and Canada (ECCC, 2021) and 2014 data for global (World Resources Institute, 2020).

The annual Project emissions from the construction stage and the operation stage were calculated by assuming a 3-year period of construction and 75-year period of operation, respectively. The GHG emissions from construction stage of this Project are 0.02% (or less) of GHG emissions from all sectors in Quebec, Ontario, Canada and global. The operation of the Project is not expected to result in a net increase in GHG emissions when compared to the GHG emissions from the existing bridge because the traffic volumes are not expected to change (i.e., the existing and new bridge would have the same or less quantity of emissions from traffic given advancements in regulatory emission controls and increased zero-emission vehicles expected over time). A comparison of the GHG emissions from Project’s construction and operation with the existing GHG emissions (all sectors emissions) is provided in the Table 20-7 and Table 20-8.

**Table 20-7: Comparison to existing GHG emissions – all sectors**

Parameter	Emissions (tCO <sub>2</sub> e/year)	% of Ontario	% of Quebec	% of Canada	% of Global
<b>Construction</b>	12,991	0.008%	0.02%	0.002%	0.00003%
<b>Operation*</b>	63	0.001%	0.001%	0.0002%	0.000003%
<b>Total</b>	13,054	0.01%	0.02%	0.002%	0.00003%

\* assumed to have same emissions as the existing bridge’s operation which is zero net increase.

**Table 20-8: Comparison to existing GHG emissions – transportation sector**

Parameter	Emissions (tCO <sub>2</sub> e/year)	% of Ontario	% of Quebec	% of Canada	% of Global
<b>Construction</b>	12,991	0.006%	0.03%	0.006%	0.0002%
<b>Operation*</b>	63	0.001%	0.003%	0.001%	0.00002%
<b>Total</b>	13,054	0.01%	0.04%	0.01%	0.0002%

\* assumed to have same emissions as the existing bridge’s operation which is zero net increase.

The IPT currently does not have available information about the various alternatives in a level of detail needed to describe potential impacts of the alternatives on GHG emissions, and alternatives selection has not taken place at this stage.

Once the location and design of each alternative are finalized, GHG emissions associated with land clearing emissions can be estimated based on the ECCC's "Overview of methodology to develop deforestation parameters for modelling projected GHG emissions". The following, but not limited to, estimated data inputs will be used:

- Ecoregion of the land being cleared
- Type of vegetation in the land clearing area (e.g., forests, cropland, grassland, wetlands, built-up land)
- Size/area of the land clearing
- Practice for land clearing, e.g., uproot and burn, decay, etc.
- Any estimates of % footprint reductions from business as usual

The activities that would result in an impact on carbon sinks as well as, land areas expected to be impacted by the Project are not known at this point. Specific factors from each alternative that could influence GHG emissions include bridge design and footprint (i.e., land clearing, length of the bridge), construction schedule (i.e., which alternative that takes longer to be built), level of complexity of construction (i.e., number of heavy/construction equipment required during construction and deconstruction, and for how long). However, the IPT currently does not have available information to estimate GHG emissions associated with each alternative. As the project progresses, the IPT will be able to estimate GHG emissions from each alternative under consideration.

The IPT currently does not have available information to estimate GHG emission reductions from each proposed mitigation measure. To quantify the reductions for each of these on an ongoing basis, more information is required such as fuel savings associated with each measure, biofuels usage in lieu of fossil fuels, traffic patterns and flow during construction and deconstruction.

Once the inputs to emission reductions quantification from each of the proposed measures above are provided, GHG emission reductions and the impact to the overall emissions can be estimated. For example, for every 10 liters of diesel consumption reduction, the GHG emissions would reduce by 27 kg-CO<sub>2</sub>e. For every 10 liters of gasoline consumption reduction, the GHG emissions would reduce by 25 kgCO<sub>2</sub>e. Every liter of biodiesel (B100) used instead of lean diesel would reduce GHG emissions approximately 7% and every liter of ethanol (E100) used would reduce approximately 30% of GHG emissions. For lighting systems, the ENERGY STAR-qualified LEDs would reduce energy approximately 75%–80% (US Dept of Energy) compared to the traditional incandescent bulbs they replaced.

If required, the IPT will consider offsetting GHG emissions generated by machinery during the work to make this site "carbon neutral". During the construction stage, annual emissions will be calculated based on the number of kilometres travelled by the machinery and transportation of materials and excavations. Compensation may take the form of buying carbon credits or of carrying out independent projects.

## 20.8 Mitigation Measures

The following mitigation measures will be applied to reduce GHG emissions.

- Limit changes to existing land and river infrastructure to a minimum to reduce fuel usage related to land clearing and earthwork.
- Implement traffic planning to avoid traffic delays/vehicle idling and substantial detour during bridge deconstruction and construction activities.
- Provide mass transportation for workers from/to site (e.g., shuttles).
- Properly maintain heavy equipment and vehicles to reduce fuel consumption.
- Consider using local materials, bridge materials with the least environmental and carbon impact based on a life cycle assessment, or the specific manufacturing technology that involved recycled steel.
- Incentivize active transportation via bridge design, and ensure readiness for future public transit links.
- Divert construction waste from landfills (aim for 90% diversion rate).
- Consider using biofuels in heavy/construction equipment where feasible.
- Consider using energy efficient lighting systems or renewable energy (e.g., solar cells) for signs and bridge lighting.
- During the construction stage, annual emissions will be calculated based on the number of kilometers travelled by the machinery and transportation of materials and excavations. Compensation may take the form of buying carbon credits or of carrying out independent Projects.

## 20.9 The Project and Canada's Efforts to Reduce Greenhouse Gas Emissions

The Project will release GHG emissions during the construction and operation stages. These emissions will be accounted for in annual provincial and federal GHG totals. As presented above, annual emissions from the Project during operation are not anticipated to increase from existing conditions (see Table 20-8). With advancements in regulatory emission controls and increased zero-emission vehicles expected over time, annual emissions during operation are expected to decrease. Furthermore, with the implementation of mitigation measures during construction, the Project is not anticipated to hinder the Government of Canada's efforts to reduce GHG emissions.

## 21 GENERATED WASTE AND EMISSIONS

The following emissions, discharges and waste are anticipated during the various stages of the Project:

**Solid waste generated during construction:** It is anticipated that a substantial amount of non-hazardous solid waste will be generated throughout this Project, primarily during deconstruction of the existing bridge

**Waste materials generated during construction of the new bridge and deconstruction of the existing bridge** will be appropriately sorted, transported and disposed of in accordance with applicable provincial and federal laws and regulations, and in accordance with PSPC and waste management practices for Projects of this scope a waste management plan will be implemented for this Project as much of the waste generated from the steel replacement portion of the Project can and should be reused or recycled. The best practice set out by PSPC is to achieve a minimum of 90% diversion rate, however a higher diversion rate will be considered during the creation of the waste management plan. Where reusing or recycling is not possible, solid waste will be disposed of through licensed waste disposal companies at licensed facilities. The decommissioning of the existing bridge will result in removal of designated substances, specifically Asbestos-Containing Materials (ACMs), Lead, Mercury, PCBs, and Silica (DST, 2013). Therefore, a Designated Substances Assessment may be required to meet the requirements of O. Reg. 278/05 (Designated Substances – Asbestos on Construction Projects and in Buildings and Repair Operations) under the *Occupational Health and Safety Act*. The need for a Designated Substances Assessment will be confirmed during the detailed design stage.

**Liquid discharges:** Potential sources of liquid discharges during construction include runoff arising from precipitation events. Standard ESC measures will be implemented to reduce potential suspended solids in runoff and other related environmental impacts. These measures will include a requirement that hazardous wastes (if any) shall be handled in a safe manner. Hazardous materials include chemical waste, oil, paint and contaminated soil. Examples of hazardous materials used in construction work include bitumen, gasoline, diesel, oil and grease, as well as any empty containers and waste associated with these materials. Contractors will be required to transport, store and handle all such substances as recommended by the suppliers/manufacturers and in compliance with all applicable provincial and federal regulations. If hazardous waste is generated or found to be present, this material must be managed in compliance with the *Environmental Quality Act, Regulation Respecting Hazardous Materials*. Additionally, subsequent shipments of hazardous waste must be conducted in compliance with the *Transportation of Dangerous Goods Act and Regulations*.

**Air emissions during construction and deconstruction:** Intermittent air emissions from equipment and vehicles will occur during the construction stage of the Project. Best Management Practices will be implemented where applicable, such as reducing vehicle idling time, shutting down equipment when not in use, stabilizing disturbed areas through the use of water for dust control, provide proper maintenance of equipment and vehicles operating in work areas, etc.

**Air emissions during operation:** Air emissions will occur during operation, but are not expected to change from existing conditions, since the new bridge will continue to have 2 lanes and it is not expected that the new bridge will attract more vehicles in comparison with existing conditions.

**Surface water drainage:** Bridge drains will also be installed on the new bridge. The number and location of drainage outlets and bridge drains will be established as part of detailed design. No other liquid discharges are anticipated as part of this Project.

**Accidental Spills:** Chemicals or liquids with the potential to result in a spill must be stored in a manner to reduce spill potential. In the case of an accidental spill, the appropriate agencies will be notified as required (See Section 22.2). Specific mitigation measures targeting an accidental spill and preparation of an accidental spill response plan will be developed during detailed design, but the following provides examples of measures that will be used to reduce potential spills:

- double walled containers or spill containment are required for storage containers larger than 100 L
- containers of 100 L or less must be stored on drip trays
- maintaining containers closed when not in use
- establishing storage locations at least 30 metres from environmentally sensitive areas or surface water bodies, and wherever possible at least 10 metres from the boundary of the PDA
- establishing storage locations away from high traffic areas and/or protecting the storage containers from vehicular impact.

In addition, the following ESC measures will be applied during construction:

- No equipment will be permitted to enter any natural areas beyond the sediment fencing during construction.
- Materials requiring stockpiling (fill, topsoil, etc.) will be stabilized and kept a safe distance from any sensitive natural features.
- Exposed soil areas will be stabilized and re-vegetated, as appropriate. Seed and mulching, or seed and an erosion control blanket will be applied to disturbed sites promptly upon completion of construction activities.
- Refueling of equipment will be carried out away from any sensitive natural features to avoid potential impacts as a result of accidental spill.
- In addition to any specified requirements, additional sediment fence will be available on site, prior to grading operations, to provide a contingency supply in the event of an emergency.
- Potential impacts on groundwater resulting from the construction, decommissioning and operation of the bridge will be reduced through the implementation of mitigation measures such as fueling vehicles, and other construction equipment in designated areas.



## 21.1 Non-Hazardous Solid Waste

Pursuant to PSPC's Real Property Sustainability Framework (PSPC, 2015) and the Real Property Sustainable Development and Environmental Strategy (PSPC, 2018) and in response to the FSDS 2019-2022 and the Treasury Board's Greening Government Strategy (TBS, 2020), all Projects greater than \$1 million must implement Construction, Renovation and Demolition (CRD) waste management practices. These practices are comprised of reduction, reuse and recycling initiatives to achieve a minimum non-hazardous waste diversion rate of 90%, striving to achieve 100% diversion by 2030, and reduce the Project's waste intensity (tonnes/m<sup>2</sup>) by 5%, where feasible.

CRD waste should not include any hazardous materials (i.e., waste generated from asbestos, mold, lead abatements, PCB ballasts, fuels, or other chemicals). Therefore, a clear distinction must be established between CRD non-hazardous and hazardous waste.

In addition, the following sections detail an overview of the basic steps for the Non-Hazardous Solid Waste (NHSW) management planning process. These steps are echoed in further detail in section 01 74 19 of the National Management System and should be considered when the Project specifications are being prepared.

The Project team must develop a Non-Hazardous CRD Waste Management Program for the Project, which must include the following key deliverables:

### 21.1.1 Prior to deconstruction and construction

**Waste audit:** determines the types and volumes of construction materials that will be produced as surplus to the Project, as well as the preliminary options and diversion potentials for waste reduction, reuse and recycling. Although PSPC has committed to a diversion target of 90%, all efforts should be made to maximize waste avoidance and diversion, setting a revised target based on the results of the waste audit. The Consolidated Waste Inventory will be used to inform the Waste Audit in full consultation and coordination with the Consultant based on the deconstruction and construction scope.

**Waste Reduction Work Plan:** identifies the overall waste diversion goal and material specific targets. It describes Project specific procedures to maximize the recovery of those materials identified in the Waste Audit. This also includes the Material Source Separation Program that details on-site sorting and labelling practices, tracking and reporting procedures and destinations for the materials recovered to be implemented during the construction stages of the Project.

Due to environmental concerns about hazardous substances reaching the Ottawa River, the deconstruction of the existing bridge and removal process will require a controlled deconstruction approach instead of using explosives. Containment procedures (for example, tarpaulin stretched under the work area) at superstructure cutting locations will be required as components are removed.

### 21.1.2 During and post-construction

**Training:** discuss the procedures and challenges of the Waste Reduction Work plan.

**Waste Diversion Report:** Documents the recovered construction materials to ensure that the results anticipated in the Waste Audit and Waste Reduction Work plan are realized to the highest degree possible. It records the results at the end of the Project, including overall Project diversion rate using hauling and tracking records to confirm the quantities (percent and tonnage) and final destinations of the materials diverted/landfilled.

## 21.2 Hazardous Solid Waste

If subject hazardous waste is generated or found to be present as defined by provincial regulations (i.e. Environmental Protection Act, for Ontario Regulation 347, General – Waste Management or Quebec Environment Quality Act, Land Protection and Rehabilitation Regulation Q-2, r. 37), this material must be managed in compliance with respective regulation. Additionally, subsequent shipments of hazardous waste deemed to be a dangerous good in accordance with the Transportation of Dangerous Goods Act and Regulations must be conducted in compliance with the Act and Regulation.

Identify, label and properly store all hazardous waste and/or hazardous materials (e.g., fuels, oil, lubricants, etc.) respecting the National Fire Code, occupational health and safety regulations or as otherwise prescribe in law, best practices or by relevant guidelines.

Hazardous waste and/or hazardous materials will be stored in cabinets or containers having secondary spill containment in such a manner that prevents releases to the natural environment.

Ensure all construction equipment is well maintained and free of leaks of fuels and other products.

## 22 ENVIRONMENTAL PROTECTION

This Section provides an initial overview of some of the components of the Environmental Protection Plan (EPP) that will be developed by the construction team for the Project. The EPP must provide a comprehensive overview of known or potential environmental issues to be addressed during the Project. It will outline the proposed environmental protection measures and commitments to be carried out by the contractor during construction to avoid or reduce potential impacts. The IPT will work with interested Indigenous communities to include their interests and environmental knowledge in the Project. This effort will include ongoing consultation, the participation of Indigenous communities in studies, and discussion of potential mitigation options.

Components of the EPP may include, but are not limited to, various plans that must provide a comprehensive overview of known or potential environmental issues to be addressed during the Project. Anticipated Plans, containing an assessment of issues and guidance on reducing potential impacts, include:

- Accident and Malfunction Response Plan
- Spill Response and Action Plan
- Soil Management Plan
- Erosion and Sediment Control Plan
- Waste Management Plan
- Dust Management Strategy and Air Pollution Control Plan
- Heritage Conservation and Mitigation Plan
- Tree Protection and Compensation Plan
- Invasive Species Management Plan
- Construction Air Pollutant Emissions Reduction Plan
- Isolation and Dewatering Plan
- Environmental Protection Plan for Construction
- Site Restoration Plan
- Communications Plan
- Fish and Fish Habitat Protection and Offsetting Plan
- Wildlife Management Plan
- Navigation Management Plan

Sensitive environments around the Project include the Ottawa River and its associated fish habitat, wildlife habitat and one downstream drinking water intake. This drinking water intake, located about 5 km downstream north of Kettle Island supplies the drinking water production plant for Gatineau sector. During deconstruction and construction, protection of these features from the potential effects of erosion or sediment release, spill incidents or other accidents and malfunctions will be further described in respective plans. PSPC's Environmental Procedures define *environmental protection* as the prevention or control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

Preliminary information is presented for four plans which form part of the emergency response system:

- Accident and Malfunction Response Plan
- Spill Response Plan
- Material Management Plan
- Erosion and Sediment Control (ESC) Plan

The goal of these plans is to prevent accidents and unplanned releases to the environment through the implementation of prevention, mitigation and control measures. Should an event occur, the plans will describe obligations to report on emergencies and minimize the environmental impacts. The IPT will encourage the contractor to limit the use of chemicals and fuels on the site to the minimum amount required. The contractor will also be required to implement barriers to transmission like silt fences, check dams or straw bale filters. Environmental monitoring will be implemented to confirm appropriate measures are in place and functioning during the construction stage.

## 22.1 Accidents and Malfunctions Response Plan

The accident and malfunction response plan will provide an assessment of the risk of environmental impacts associated with the potential release of contaminants to the environment resulting from the failure of certain structures due to human error or exceptional natural events.

The focus of the Accidents and Malfunctions Response Plan will be to identify potential worst credible scenarios for accidents and malfunctions deemed significant and their impacts on the environment, including an explanation of how those events were identified and potential consequences. Significant events would be those that could have a material and measurable environmental impact or have a reasonable probability of occurring during the life of the Project. In addition, potential interactions with biophysical and social VCs will be identified and their environmental effects will be assessed.

Where the likelihood or sensitivity of an accident scenario is high, the assessment will include contaminants and other materials potentially released into the environment during the event that could result in an adverse environmental. The trajectory and/or dispersion modeling for accidental releases will be analyzed. Spatial boundaries would include the area covered by the Project footprint, rivers and water bodies within the Project footprint and adjacent areas, as well as communities described in Figure 14-6 and municipal roads.

The risk assessment will follow methodology consistent with Canada's National Standard CAN/CSA-IEC/ISO 31010 for risk assessment, or similar. The approach will include hazard identification, risk measurement, and risk evaluation. Risk criteria will be used to evaluate the significance of residual impacts based on the potential severity of the consequence from the accident or malfunction.

A three step process is provided as an example of an approach to assess impacts from a Project-related accident and malfunction:

1. Potential accidents, malfunctions, and unplanned events that might occur during the life of the Project would first be identified based on planned deconstruction and construction methodologies selected and professional judgment. The analysis would focus on events that may result in measurable risks to personnel, the environment, infrastructure, and human health.
2. Then, interactions between each event scenario and relevant VCs would be analyzed to establish the potential significance and severity of the effects. Mitigation and management measures to prevent the incident from occurring would then be established to minimize the potential for such occurrences to happen or reduce the severity of the impacts.
3. A risk assessment would then be conducted using the likelihood and severity of the unplanned event in each scenario. The analysis of residual effects would establish the severity of the hazard associated with the event scenario. The likelihood of the event would be derived from experience with past, similar projects, literature sources, and professional judgment.

The approach selected by the contractor during construction planning may follow a different process to achieve appropriate planning and contingency management objectives.

The work will be conducted in accordance with all applicable environmental requirements under federal and provincial laws, regulations, guidelines and standards that provide direction to conduct the work, avoid potential unplanned events and take action to remedy issues should impacts occur as a result of occurrences. The regulatory framework includes but not limited to the following:

### 22.1.1 Regulatory Framework

The plans will follow the Emergency Response Planning Guide, published by the Canadian Centre for Occupational Health and Safety (2004). PSPC is required to have some emergency response planning in place for its properties and operations as per the following legislation:

- Emergency Management Act (2007)
- Canadian Environmental Protection Act (1999) and its regulations
- Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c. 34).

Procedures have been established for each risk. These procedures are based, among other things, on the following documents:

- National Fire Code of Canada
- Departmental Emergency Book
- National Fire Protection Association (NFPA)
- PSPC Departmental Policy 001 "Policy for Emergency Preparedness in Public Works and Government Services Canada"
- PSPC Departmental Policy 009 "Critical Incident Reporting Policy" (DP 009)
- Emergency Preparedness Act
- Canadian Environmental Protection Act, 1999 (CEPA 1999).

Other legislation that may be applicable depending on the nature of the emergency include:

### Federal

- Impact Assessment Act (S.C. 2019, c. 28, s. 1)
- Physical Activities Regulations (SOR/2019-285)
- Species at Risk Act (S.C. 2002, c. 29)
- Fisheries Act (RSC, 1985 c. F-14)
- Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22)
- Canada Wildlife Act (R.S.C., 1985, c. W-9)
- Canadian Navigable Waters Act (R.S.C., 1985, c. N-22)
- National Capital Act (R.S.C., 1985, c. N-4)
- COSEWIC Status Reports
- Canadian Council of Ministers of the Environment (CCME), Guidelines and Guidance documents
- Health Canada Guidance documents
- Federal Sustainable Development Strategy and PSPC Department Sustainable Development Strategy
- PSPC Real Property Sustainability Handbook, Implementing the Sustainable Development and Environmental Strategy, April 2021The Federal Sustainable Development Strategy

### Provincial

- Ontario Environmental Protection Act (R.S.O. 1990, c.E.19), Environmental Compliance Approvals (ECA) for Wastewater, Waste, Air, and Noise
- Ontario, Environmental Assessment Act (R.S.O. 1990, c. E.18)
- Ontario, Endangered Species Act (S.O. 2007, c. 6)
- Ontario, Invasive Species Act (S.O. 2015, c. 22)
- Ontario, Fish and Wildlife Conservation Act
- Ontario Water Resources Act (387/04), Permit to Take Water or (PTTW)
- Ontario Heritage Act (R.S.O. 1990, c. O.18), Archaeological clearance
- Ontario Dangerous Goods Transportation Act (R.S.O. 1990, c. D.1)
- Quebec Environmental Quality Act (Q-2)
- Quebec Act respecting threatened or vulnerable species (e-12.01)
- Quebec Act respecting the conservation and development of wildlife (c. 61.1)
- Water Resources Preservation Act (c. 21, s. 32)
- Quebec Cultural Heritage Law (P-9.002), Archaeological research permit
- Quebec Highway Safety Code (c. 24.2, s. 622) - Transportation of Dangerous Substances Regulation

### Guidelines

- Clean Equipment Protocol for Industry, Inspecting and cleaning equipment for the purposes of invasive species prevention, Ontario, 2013
- Protocol for Wildlife Protection during Construction, Ottawa, 2015
- Fisheries Act Standards and Code of Practice

- Projects near water review, Department of Fisheries and Oceans (DFO)
- Ontario Ecological Land Classification
- PSPC Species at Risk Act Protocol
- NCC's Bird-Safe Design Guidelines
- Ontario Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat
- Quebec Freshwater timing windows for carrying out work in fish habitat

## 22.2 Spill Response Plan

Although the potential exists that a small volume of fuel or other contaminant could be accidentally released to the environment, it is anticipated that construction best practices (i.e., fueling locations setback from drainage / watercourse) and mitigation measures (i.e., spill containment) will limit the likelihood and potential for serious accidents or events causing significant negative environmental effects from the Project. Any follow-up and monitoring plans will be developed for VCs where residual adverse effects are predicted or uncertain. If required, follow-up and monitoring plans will be developed in conjunction with the hazmat response team within the City of Ottawa and Ville de Gatineau, during relevant Project phases.

While a spill or accidental release of hazardous substances during deconstruction of the existing bridge and construction of the new bridge is possible, such an event is expected to be a small or low impact release (i.e., isolated spill of fuel or broken hydraulic line). Prevention measures include regular inspection / maintenance of construction equipment and implementing designated re-fueling areas with appropriate containment.

If an accidental release does occur, measures to control, contain, recover and clean up the release are to be implemented in a timely manner to minimize the potential for adverse environmental and human health effects. Effective containment of spills onto land or into a waterbody or watercourse depends on a variety of factors including: the composition of the release material, duration and extent of the release, topography, solubility of the material, viscosity of the liquid, water currents, and soil permeability. Mitigation measures to reduce risks to surface water from spills or discharge from dewatering are described in Section 15.1.4.2

For the Project, it is anticipated that spill response measures and proposed mitigation measures will reduce potential residual effects so that they are not significant. This will be further evaluated and confirmed during detailed design.

The following are examples of measures to be implemented to recover and remediate an accidental release adjacent to, or into, a watercourse or waterbody.

- Recover the released materials from the containment area using equipment suitable to the nature and extent of the release
- Deploy booms, skimmers, sorbent pads or a functionally equivalent containment structure to contain releases in or near a watercourse or waterbody
- Recover spilled product

- Cleanup the release and containment areas. Consult with a qualified remediation specialist, where required
- Dispose of containment materials, and contaminated soil, vegetation and water at an approved facility

In addition, during the critical phases of work in water, emergency environmental response teams will be pre-deployed for high-risk operations.

### **Environmental emergency regulations: reporting a spill or release**

Section 201 of the Canadian Environmental Protection Act, 1999 (CEPA 1999) requires that, when an environmental emergency occurs for any of the substances on the list established on Schedule 1 of the Environmental Emergency Regulations (E2 Regulations), requires that a verbal notification be made as soon as possible under the circumstances to the authorities identified in the schedule of the Release and Environmental Emergency Notification Regulations (Notification Regulations) or on the Report an environmental emergency webpage, and a written report as soon as possible under the circumstances to the relevant authorities designated pursuant to subsection 18(2) of the E2 Regulations.

If spills occur in Ontario, the Ministry of the Environment, Conservation and Parks (MECP) Spills Action Centre (1-800-268-6060) will be contacted, and all reasonable corrective action will be taken to contain and clean the spill immediately.

If spills occur in Québec, the équipes régionales d'intervention Urgence-Environnement (1 866 694-5454) of the Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks (MEFCCWP) will be contacted and all reasonable corrective action will be taken to contain and clean the spill immediately. In addition, reasonable efforts must be made to notify any member of the public who may be adversely affected by the environmental emergency.

This applies to an environmental emergency that:

- has or may have an immediate or long-term harmful effect on the environment
- constitutes or may constitute a danger to the environment on which human life depends
- constitutes or may constitute a danger in Canada to human life or health

## **22.3 Material Management Plan**

WSP Canada Inc. (WSP) was retained by Public Services and Procurement Canada (PSPC) to complete an *Excess Material Management Plan* (EMMP) (WSP, 2021b) for the Project. The EMMP provides an initial comprehensive program for the management of excess materials (soil, surface water, groundwater, sediment, bedrock and wood chip) expected to be encountered during the construction of the Project. It is a requirement by PSPC to support the design and the construction of the Project.



The EMMP is expected to be revised as the Project is further defined, in response to:

- Changes in the scope of work.
- Modification of construction means or methods.
- Changes in applicable law or standards.
- Any other instance whereby the Contractor or PSPC assesses that the current plan does not adequately address the risk for the management of excess materials.

The Plan is based on consideration of the following:

- specific requirements of applicable laws, regulations, guidelines, and other policies for the management of soil,
- surface water, groundwater, bedrock, sediment and wood chips in Ontario and Quebec, and on Federal Land
- specific types and chemical quality of excess materials in particular the presence of contaminants of concern, as noted in the Phase II Environmental Site Assessment (ESA) (WSP, 2021a).

### 22.3.1 Regulatory Framework

As the project is occurring on federal land, the construction of the new bridge is being completed under a federal regulatory framework. The applicability of the provincial and municipal (City) regulatory framework will be considered and applied where deemed necessary.

#### Federal Regulatory Framework

The governing federal regulatory framework for characterizing excess soil and excess sediment quality are:

- Canadian Council of Ministers of the Environment (CCME), Soil Quality Guidelines for the Protection of Environmental and Human Health for a commercial land use with unprotected groundwater and coarse-textured soils; and for characterizing groundwater quality,
- Federal Interim Groundwater Quality Guidelines (FIGQG) for Federal Contaminated Sites for the Protection of Freshwater Aquatic Life in a coarse texture soil condition and industrial and commercial land uses.

Provincial regulations include information related to the management, testing and disposal of excess materials, such as soil and groundwater. Provincial regulations also include requirements related to permitting and certification of activities and persons involved in the removal, handling and receiving of such excess materials. Accordingly, the Contractor manage excess materials in accordance with the Ontario regulations for soil and groundwater management because, by definition, excess materials will be moved from the federal site to locations that fall under either Ontario provincial jurisdiction or Quebec provincial jurisdiction.

Applicable provincial regulations are identified in the following documents:

## Provincial Regulatory Framework - Ontario

- Ministry of the Environment, Conservation and Parks (MECP) On-Site and Excess Soil Management Regulation (O.Reg. 406/19)
- Ontario Environmental Protection Act (EPA)
  - Ontario Regulation (O. Reg.153/04) – Record of Site Condition – Part XV.1 of the Act made under the Ontario EPA; (O. Reg. 347)
  - General – Waste Management under the EPA. Defines waste and requires that it be hauled by licensed transport systems to disposal sites that are licensed to receive the types of waste materials. Schedule 4 of O. Reg. 347 establishes limits for waste characterization (e.g.non-hazardous vs. hazardous)
- Ontario Provincial Standard Specification (OPSS 180) – General Specification for the Management of Excess Materials
- Ontario Water Resources Act.

## Municipal Regulatory Framework – City of Ottawa

- Sewer Use Discharge - By-law No. 2003-514

## Provincial Regulatory Framework - Quebec

- Ministère de l'Environnement et de la Lutte contre les changements climatiques - Guide d'intervention, Protection des sols et réhabilitation des terrains contaminés (March 2019)
- Management of excess soils, surface water, groundwater, sediments and residual material (wood chip)
- Environment Quality Act (EQA), (c. Q-2)
  - Regulation respecting the burial of contaminated soils (c. Q-2, r. 18). Describes the materials that cannot be disposed in a contaminated soil burial site as well as storage and burial requirements of such sites;
  - Land Protection and Rehabilitation Regulation (c. Q-2, r. 37). Describes the limit values applicable to soil quality and different categories of activities concerned.
  - Regulation respecting contaminated soil storage and contaminated soil transfer stations (c. Q-2, r. 46). Describes the requirements associated to contaminated soil transfer stations. Describes how to temporarily store contaminated soils.
  - Regulation respecting hazardous materials (c. Q-2, r. 32). Defines what is a hazardous material.
  - Transportation of Dangerous Substances Regulation (c. C-24,2, r.43). Describes how to manage the transportation of contaminated soils in Quebec.
  - Regulation respecting solid waste (c. Q-2, r. 13)
  - Regulation respecting landfill and incineration of residual materials (c. Q-5, r. 19)
  - Ministère de l'Environnement et de la Lutte contre les changements climatiques – Guide d'application du Règlement sur l'enfouissement et l'incinération de matières résiduelles (REIMR c. Q-2, r.19). Defines fibrous / ligneous residues and describes their management as well as the types of facilities authorized to dispose such residues.

## Municipal Regulatory Framework – City of Gatineau

- Sewer discharge – Regulation 821-2018

### 22.3.2 Management of Different Materials

#### Bedrock

This project is expected to require excavation, stockpiling, management and hauling of bedrock. Excess bedrock coming both from Ontario and Quebec may be stockpiled or disposed as fill off-site in Ontario at a facility licensed to receive such material in accordance with OPSS 180, applicable waste regulations, and industry best practices. The receiving site(s) must be approved by the Department Representative prior to receiving excess rock, and written confirmation must be obtained from the receiving site(s) indicating acceptance of the rock material. Weigh tickets and truck manifests, where applicable, must be obtained and tracked. Disposal related information, including confirmation of receiving site certifications may form part of the information requested by the department representative during audits.

Disposal of bedrock coming from Ontario and Quebec can be disposed off-site in Quebec at a facility licensed to receive such material in accordance with Regulation respecting the landfilling and incineration of residual materials (Q-2, r. 19). Should reuse of excess rock material be beneficial to the Project, the Contractor may consider this as part of their work, and shall discuss reuse opportunities with PSPC.

#### Soil

While the overburden has been confirmed to contain levels of certain chemical compounds in excess of CCME Guidelines as well as Provincial Standards (WSP, 2021a), analysis using the toxicity characteristic leaching procedure (TCLP) has shown the impacted soil is non-hazardous as all parameters are in compliance with MECP Schedule 4 of Ontario Regulation 558. Special requirements for handling and disposal of hazardous soils are not anticipated (WSP, 2021b).

#### Sediment

All excess sediment cannot be reused elsewhere on-site and must be disposed of at an off-site receiving site licenced to receive such sediment/soil.

#### Wood Chips

A significant quantity of wood chips was encountered in ESA Phase II (WSP, 2021a) completed in the Ottawa River Basin (BH20-R2 to BH20-R4). Samples submitted for chemical analysis were compared to the CCME Guidelines only as wood chips are not considered as soil. The results indicated that the wood chips contained elevated levels of metals (arsenic, cadmium copper and lead) and a number of PAH compounds. Testing as per Quebec hazardous waste regulations also showed the wood chips leachate was non-hazardous.

All excess wood chips cannot be reused elsewhere on-Site and must be disposed of at an off-site receiving site able to receive such materials.

Off-Site disposal of wood chips is subject to the following conditions:

- All excess wood chips are to be transported to an acceptable receiving site. Suitable receiving sites will be identified by the Contractor.
- The Contractor will only dispose of materials at sites that have been reviewed and approved by the PSPC in consultation with the Contractor.
- Written confirmation from the wood chip receiving site(s) indicating acceptance of the material based on the laboratory results is to be provided to the PSPC
- Copies of the trip tickets or receipts provided by the wood chip receiving site(s) will be retained in the project files and documented in the Excess Material Management Implementation Report.

## 22.4 Erosion and Sediment Control Plan

Erosion and Sediment Control (ESC) measures will be implemented and maintained throughout all stages of construction to protect the receiving waters and surrounding environment. ESC measures should be installed around the extent of the construction work zone(s) as well as around the perimeter of stockpiles required for construction. ESC structures should be monitored to maintain their effectiveness through the life of construction and post-construction rehabilitation. If the erosion is resulting from a construction related activity, the activity should be halted immediately until the situation is rectified. All activities, including maintenance procedures, should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious (harmful) substances into the water.

Even with ESC measures, extreme precipitation events could result in collapse of silt fencing, overflow or bypass of barriers, and other situations which could lead to erosion. Work should be limited or stopped during and immediately following significant precipitation events (i.e., 100-year storm event), and the measures should be inspected, at the discretion of on-site environmental personnel.

Stormwater management and surface water run-off during construction must be managed in a manner to minimize run-off into the storm sewers or directly into the Ottawa River. A dewatering program may be required, as part of the excavation works, and must comply with the following conditions:

- Provision, operation, and maintenance of necessary equipment appropriately sized to keep excavations, staging areas, and other work areas free from water
- Water barriers as necessary to protect the site from soil erosion and from the runoff of surface water from work areas.
- Control of surface drainage to ensure that water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff is intercepted and diverted to suitable outlets
- Disposal of water in a manner not injurious to public health or safety, to property, or to any part of work completed or under construction. Testing of water (i.e., surface water runoff or infiltrated groundwater) is required prior to discharge to municipal sewers to demonstrate its suitability for such discharge.

Surface soil erosion can occur in the absence of vegetative cover. Slope stability should be reviewed at watercourse edges. ESC and stabilization measures should be maintained during construction,

restoration, and rehabilitation until vegetative cover is established. Where evidence of erosion exists, corrective control measures should be implemented as soon as conditions permit. Additional measures to protect surface water are described in Section 15.1.4.2.

The site erosion control measures generally comprise the following:

- Provision of overland drainage and conveyance routes to direct storm water and sediment toward the existing catchbasins and ditches
- Provision of appropriate erosion control measures such as gravel or rock lining within conveyance routes and rock check dams utilized to slow the conveyance of storm water flows.
- Provision of perimeter silt control fences
- Provision of additional erosion protection such as straw bales in the vicinity of ditches, and filter socks at catch basins can be provided during construction at the discretion of the Department Representative.

A detailed erosion control plan will be required prior to construction.



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## Appendix A – List of Stakeholders, Partners and Groups

417 Bus Lines	Allegiance Transportation Services	Association des groupes en arts visuels francophones
ABLE2	Alliance to end Homelessness	Association des neurotraumatisés de l'Outaouais
AbleTo / David C. Onley Initiative	Alta Vista Community Association	Association des résidents de Deschênes
ACCUEIL-PARRAINAGE OUTAOUAIS	Ambleside Three CCC #91	Association des résidents de la Terrasse Lakeview
Action Canada for Sexual Health & Rights	Ambleside Two CCC #43	Association des résidents de l'Île-de-Hull
Action Sandy Hill	APHVO	Association des résidents de l'Île-de-Hull
Action vélo Outaouais	Arcadia Community Association	Association des résidents de l'Île-de-Hull (Representative)
Action vélo Outaouais (Representative)	Archives Lanark	Association des résidents des Jardins Taché
Active Living Alliance	Ashbury College (Private School)	Association des résidents du Plateau
Advantage Boating	Association de la construction du Québec	Association des résidents du quartier de Connaught
Aéroport de Gatineau (Gatineau-Ottawa Executive Airport)	Association des architectes paysagistes du Québec	Association des résidents du quartier Wright
AIDS committee of Ottawa	Association des constructeurs de routes et grands travaux du Québec	Association des riverains de la rue Jacques-Cartier Ouest
Algonquin College - General Info Line	Association des constructeurs de routes et grands travaux du Québec	Association du Camionnage du Québec
Algonquin College - Government relations	Association des femmes immigrantes de l'Outaouais AFIO	
Algonquin College - Student Association		
Algonquin College - Student Experience Office		



Association récréative et culturelle de Templeton	Billing Estate	Bytown Museum (Representative 1)
Astolot Educational Center (Private School)	Black History Ottawa	Bytown Museum (Representative 2)
Au Feel de L'Eau / Aqua Taxi	Blackburn Community Association	Byward Market BIA
Avenue des Jeunes	Blue Line Taxi	Byward Market BIA (Representative)
Bank of Canada Museum	Blyth Academy (Private School)	Campus3/Centre des aînés de Gatineau
Bank Street	Bradley Estates Community Association	Canada Army Run
Barrhaven	Briarbrook and Morgan's Grant Community Association	Canada Aviation and Space Museum
Barrhaven East Community Association	Bridlewood Community Association	Canada Green Building Council
Bayshore Community Association	Brigil	Canada Lands Company
Bayshore Mall	Brigil (Representative)	Canada Mortgage and Housing Corporation (CMHC)
Beacon Hill Community Association	Britannia Community Gardens	Canada Science and Technology Museum (CSTM)
BeetBox Co-op Farm	Britannia Village Community Association	Canadian Biodiversity Institute
Bel-Air Community Association	Britannia Woods Community House	Canadian Construction Association
Bells Corners	Britannia Yacht Club	Canadian Council of the blind
Belltown Neighbours Association	British High Commission	Canadian Cycling Association
Best Western Plus	Bryanston Gate Community Association	Canadian Hard of Hearing Association
BGIS - National Heritage Conservation Manager (Representative)	Bureau Régional d'Action sida BRAS	Canadian Institute of Planners
Bike Ottawa	Burritt's Rapids Community Association	Canadian Museum of History
Billing Bridge Mall	Bytown Museum	

Canadian Parks and Wilderness Society - Ottawa Chapter	Carleton University - David C. Onley Initiative	Carp Village
Canadian Society of Civil Engineers	Carleton University - Dean - Arts and Social Sciences	Catholic Centre for Immigrants
Canadian Society of Landscape Architects	Carleton University - Dean - Public Affairs	Cégep de l'Outaouais, Felix-Leclerc campus - Director General
Canadian Trucking Alliance (provincial alliance)	Carleton University - Dean - Sprott School of Business	Cégep de l'Outaouais, Felix-Leclerc campus - Student Life
Canadian War Museum	Carleton University - Dep. Of Civil and Environmental Engineering - Architectural Conservation and Sustainability	Centraide Outaouais
Canadian Wildlife Federation	Carleton University - Dep. Of Civil and Environmental Engineering - Architectural Conservation and Sustainability	Centre alimentaire Aylmer
Canterbury Community Association	Carleton University - Executive Assistant	Centre Asticou
Capital Cruises	Carleton University - Experiential Learning and Operations Coordinator	Centre d'entraide aux aînés
Capital Heritage Connection	Carleton University - Faculty of Science	Centre des jeunes de Wakefield
Capital Pride	Carleton University - READ initiative	Centre Mino Madji8in (La Cité)
Capital Taxi	Carleton University - Student Association	Centretown Citizens Community Association
Cardinal Creek Community Association	Carlington Community Association	Centretown Community Healthcentre
Cardinal Glen Community Association	Carlingwood Community Association	Chambre de commerce de Gatineau
Carleton - Paul Menton Centre	Carlingwood Mall	Chambre de commerce de Gatineau (Representative)
Carleton Golf and Yacht Homeowners Association	Carlsbad Springs Community Association	Champlain Park Community Association
Carleton Heights & Area Residents Association	Carp	Chapel Hill North Community Association
Carleton Place and Beckwith Heritage Museum		Chapel Hill South Community Association
Carleton University - Corporate Relations Officer		Chateau Laurier

CHEO	Collège Saint-Joseph de Hull	Conseil scolaire de district catholique de l'Est Ontarien (CSDCEO) - Board of Trustees and general
CISSS de l'Outaouais	College Square	
City Centre Coalition	Comité de vie de quartier du Vieux-Gatineau	Conservation de la Nature Canada
City of Ottawa	Comité de vie quartier Pointe-Gatineau	Constance and Bucham's Bay Community Association
City of Ottawa - Inspector, Traffic Management	Comité Solidarité Gatineau-Ouest	Convent Glen Orleans Wood Community Association
City of Ottawa (Representative 1)	Commission scolaire au Cœur-des-Vallées	Corkery Community Association
City of Ottawa (Representative 2)	Commission scolaire des Draveurs	Cornerstone Housing for Women
City View Community Association	Commission scolaire des Portages-de- l'Outaouais	Council of Construction Associations
Civic Hospital Neighbourhood Association	Commission scolaire Western Québec	Country Place Community Association
Civil Engineer - Member of the coalition to save the Alexandra Bridge	Community Living Association Lanark County (1)	Crossing Bridge Residents' Association
Classic Alliance Motorcoach	Conseil des écoles catholiques de langue française du Centre-Est (CECLFCE)	Crystal Beach/Lakeview Community Association
Climate Action Network	Conseil des Écoles Publiques de l'est de l'Ontario (CEPEO) - Board of Trustee	Cumberland Community Association
Clinique santé sexualité du plateau	Conseil des Écoles Publiques de l'est de l'Ontario (CEPEO) - General	Cumberland Heritage Village
Club de voile Grande rivière		Cumberland Township Historical Society
Club de voile Grande-Rivière	Conseil Économique et Social D'Ottawa- Carleton	Cycling Vision Ottawa - L'Avenir du cyclisme à Ottawa
Club Vélo Plaisirs		Dalhousie Community Association
Coalition to save the Alexandra Bridge - Heritage Ottawa, Société d'histoire de l'Outaouais, National Trust Canada, Association des résidents de l'Île-de-Hull, an architect and a civil engineer.	Conseil régional de l'environnement et du développement durable de l'Outaouais	David C. Onley Initiative
		Delaney Bus Lines

Developmental Services Ottawa	Embassy of Iceland	Embassy of the Philippines
Diefenbunker	Embassy of Ireland	Embassy of the Republic of Estonia
Disabled Women's Network Canada	Embassy of Israel	Embassy of the Republic of Turkey
Downtown Rideau	Embassy of Italy	Embassy of the United States of America
Ducks Unlimited Canada	Embassy of Japan	Embassy of Ukraine
Dunrobin Community Association	Embassy of Latvia	Embassy of Vietnam
Earl of Sussex	Embassy of Mexico	Enviro Éduc-Action
Eastway Gardens Community Association	Embassy of Mongolia	Envirocentre
Ecology Ottawa	Embassy of Qatar	Envirocentre (Cycling)
Elizabeth Fry Society	Embassy of Republic of Korea	Envirocentre (Cycling) (Representative)
Elmvale Acres Community Association	Embassy of Romania	Environmental Stewardship Committee (City of Ottawa)
Elmvale Acres Shopping Centre	Embassy of Russia	Épilepsie Outaouais
Elmwood School (Private School)	Embassy of State of Kuwait	Evans
Embassy of Austria	Embassy of Sudan	Executive Cab
Embassy of Brazil	Embassy of Sweden	Fairwinds Poole Creek Community Association
Embassy of Denmark	Embassy of Switzerland	Fallingbrook Community Association
Embassy of Ethiopia	Embassy of the Argentine Republic	Families LGBTQ
Embassy of Finland	Embassy of the Czech Republic	Family Matters co-op
Embassy of France	Embassy of the Kingdom of the Netherlands	Family Services Ottawa
Embassy of Greece	Embassy of the People's Republic of China	

Federation de voile du Québec	Frontrunners Ottawa	Goulbourn Township Historical Society
Fédération de voile du Québec	Gatineau River Yacht club	Grands-Frères et Grandes-Sœurs de l'Outaouais inc.
Federation of Canadian Municipalities - Green Municipal Fund	Gay Ottawa Volleyball	Greater Ashton Community Association
Federation of Citizens Association	Gaytineau Pinecast	Greater Avalon Community Association
Federation of Community Associations	Gender Mosaic	Greater Ottawa Homebuilders Association (GOHBA)
Federation of Community Associations (Representative)	General Burns Community Association	Greely Community Association
Fern Hill School (Private School)	GIGC Transport QC	Greenspace Alliance
Findlay Creek Community Association	Gignul non-profit housing	Greyhound
First Nations Child & Family Caring Society	Gîte Ami	Groupe Entre Femmes de l'Outaouais
Fisher Heights and Area Community Association	Glabar Park Community Alliance	Habitation partagée
Fitzroy Harbour Community Association	Glebe	Habitation Partagées
Forêts Ottawa - Forest Ottawa	Glebe Annex Community Association	Half Moon Bay Community Association
Foster Farm Family House	Glen Cairn Community Association	Hampton Iona Community Group
Four Points Sheraton	Glengarry Historical Society	Hazeldean Mall
Friends of Mer Bleue	Glens Community Association	Healthy Transportation Coalition
Friends of Petrie Island and the Petrie Island Advisory Committee	Global Affairs Canada	Heart of Orleans BIA President
Friends of the Gatineau River	Global Centre for Pluralism	Heritage Advocate
Friends of the Rideau River	Gloucester Historical Society	Heritage College - Director general
	Gloucester Historical Society	Heritage College - General Info Line
	Goulbourn Museum	

Heritage College - Student Council	Indigenous Action Circle	Jeunesse Idem
Heritage Ottawa	Indigenous Clean Energy (ICE) network	Jewish Family Services
Heritage Ottawa (Representative 1)	Indigenous Experiences	Joan of Arc Academy (Private School)
Heritage Ottawa (Representative 1)	Ingenium Canada	Jubilee Area Residents Association (JARA)
Heritage Ottawa (Representative 2)	Intégration communautaire	Kagita Mikam
Heritage Ottawa (Representative 2)	Interested individual	Kanata Academy (Private School)
Heritage Ottawa (Representative 2)	Interested individual	Kanata Beaverbrook Community Association
Heron Park Community Association	Interested individual - former architect with a special interest in the Alexandra Bridge	Kanata Central
Hidden Harvest	Interested individual - Former PSPC employee who acted as a custodian for the Alexandra Bridge and was responsible for engineering assets across the crown.	Kanata Lakes Community Association
Hintonburg Community Association	Interested individual - Ottawa Citizen letter	Kanata North
Historical Society of Ottawa	International Society of Aborigiculture	Kanata Sailing Club
Hôpital de Gatineau/Hôpital de Hull	Inuit Tapiriit Kanatami	Kanata Spectrum
Hôpital Montfort Hospital	Inuuqatigiit	Katimavik-Hazeldean Community Association
Howard Travel	Invest Ottawa	Kinburn Community Association
Hull Marina (Portage Champlain Yacht Club)	Iskotew Lodge	Kriska Transportation
Hunt Club Community Association	Island Park Community Association	L'Arche Ottawa
Hunt Club Park Community Association	Island Park Towers Residents' Association	l'École nationale d'administration publique (ÉNAP) à Québec
Huntley Community Association	Jack Purcell Recreation Association	La Cité - David C. Onley Initiative
Huntley Township Historical Society		La Cité - General Info Line
Immigrant Women Services Ottawa		

La Cité - Student Council	Leduc	Maison du vélo
Lac Deschenes Sailing Club	Les Galeries de Hull	Mamidosewin Centre (algonquin College)
Lafarge	Les Promenades Gatineau	Manor Park Community Association
L'Amicale des personnes handicapées physiques de l'Outaouais	Leslie Park Community Association (LPCA)	Manor Park Community Council
Lanark Community Transit (LCT)	Library and Archives Canada	Manotick Culture, Parks and Recreation Association
Landscape Ontario	Ligue des voisins du Manoir des Trembles	Manotick Village and Community Association
LaSalle Academy	Lincoln-Heights Parkway Community Association	March Rural Community Association
L'Association de l'ouïe de l'Outaouais	Lindenlea Community Association	Marina Kitchissippi
L'association des entrepreneurs en construction du Québec (AECQ)	LiveWorkPlay	Marina LeBlanc et fils.
L'Autre Chez Soi	Loisir sport Outaouais	Mashkawaziwogamig (University of Ottawa)
Le Centre Actu-Elle	Lowertown Community Association	MAX Ottawa
Le Centre d'aide 24/7	Lowertown Community Association (Resident)	McKellar Park Community Association
Le club des ornithologues de l'Outaouais	Lowertown Community Association (President)	Mechanicsville Community Association
Le club des ornithologues de l'Outaouais (Representative)	Loyal Taxi	Metcalf Community Association
Le CRIO - Collectif régional de lutte à l'itinérance en Outaouais	Lycée Claudel (Private School)	Michele Heights Community House
Le Regroupement des gens d'affaires de la Capitale nationale (RGA)	Lynwood Village Community Association	Minwaashin Lodge
Lebanese and Arab Social Services Agency of Ottawa-Carleton	Main Street Community Service	Mississippi Valley Conservation Authority
	Maison d'hébergement pour Elles Des Deux Vallées MHPEDDV	Mobi-o
	Maison de la famille de Gatineau	Moisson Outaouais

MRC des Collines-de-l'Outaouais	Nepean Sailing club	Ontario Professional Planner's Institute - Eastern District Leadership Team
MRC des Collines-de-l'Outaouais	New Edinburgh Community Alliance	Ontario Restaurant Hotel & Motel Association
Munster Community Association	Notre Dame Basilica	Ontario Sailing Association
Musée de la Société d'histoire de Buckingham	Ojigkwanong Indigenous Student Centre (Carleton)	Ontario's Expert Panel on Climate Change Adaptation
National Art Centre	Old Ottawa East Community Association	Ordre des architectes du Québec
National Capital Commission - External Relations	Old Ottawa South Community Association	Ordre des ingénieurs du Québec
National Capital Concert Band	Ontario Association of Architects	Ordre des urbanistes du Québec
National Gallery of Canada	Ontario Association of Landscape Architects (OALA)	Osgood Township Museum
National Trust Canada	Ontario Association on Developmental Disabilities	Osgoode Village Community Association
National Trust for Canada	Ontario Courthouse	Ottawa Aboriginal Coalition
National Trust for Canada (Representative)	Ontario Cycling Association	Ottawa Architect - Member of the coalition to save the Alexandra Bridge
Natural Resources Canada - Canada's Climate Change Adaptation Platform	Ontario Federation of Indigenous Friendship Centres	Ottawa Art Gallery
Natural Resources Canada - Office of energy efficiency	Ontario General Contractor Association	Ottawa Bicycle Club
Nature Canada	Ontario Invasive Plants Council	Ottawa Board of Trade
Nature Conservancy of Canada	Ontario Kitesurfing society	Ottawa Booth Centre
Nautism Quebec	Ontario Nature	Ottawa Catholic School Board (OCSB) - General
Navan Community Association	Ontario Northland	Ottawa Catholic School Board Trustee (OCSB) - Board of Trustees
Nepean Museum & Pinhey's Point Historic Site		



Ottawa Central Park Community Association	Ottawa Native Friendship Centre	Ottawa-Carleton Wildlife Centre
Ottawa Centre EcoDistrict	Ottawa New Edinburgh Club	Ottawa-Gatineau Geoheritage Project
Ottawa Chinese Community Service Centre	Ottawa Police	Ottawa-Gatineau Geoheritage Project (Representative)
Ottawa Coalition of Business Improvement areas	Ottawa Police	OTTAWA'S LGBTQ+ SOFTBALL LEAGUE
Ottawa Coalition to End Violence Against Women	Ottawa Regional Society of Architects (ORSA)	Outaouais CJE
Ottawa Community Foundation - Low Carbon Cities Canada (Ottawa's Centre)	Ottawa Renewable Energy Co-op	Overbrook Community Association
Ottawa Community Immigrant Services Organization	Ottawa River Regulatory Planning Board	Paramedic Services
Ottawa Construction Association	Ottawa Riverkeeper	Paramedic Services
Ottawa Disability Coalition	Ottawa Rowing Club	Parkinson Canada
Ottawa Field Naturalists' Club	Ottawa Safety Council	Paul's Boat Lines
Ottawa Fire Dispatch	Ottawa Senior Pride Network	Perth & District Historical Society
Ottawa Gatineau Hotel Association	Ottawa Tourism	PFLAG Canada
Ottawa Gatineau Hotel Association (President)	Ottawa Transit Riders	Pinecrest-Queensway Community Health Centre
Ottawa Independent Living Resource Centre	Ottawa Wolves Rugby	Pineview Community Association
Ottawa Inline Skating Club	Ottawa Youth Engagement Committee	Place d'Orléans
Ottawa Inner City Health	Ottawa-Carleton Association for Persons with Developmental Disabilities	Polytechnique de Montréal.- Expert en mobilité
Ottawa International Airport	Ottawa-Carleton District School Board (OCDSB) - Board of Trustees	Positive Space Initiative
Ottawa Museum Network	Ottawa-Carleton District School Board (OCDSB) - General	Preston Street
		Produits forestiers Résolu

Protégeons le Quartier du Musée	Refugee613	Roll Scooters
Public Works and Government Services Canada (PWGSC) (Representative 1)	Responsible Cycling Coalition (RCC)	Royal Architectural Institute of Canada
Public Works and Government Services Canada (PWGSC) (Representative 2)	Richmond Village Association Inc.	Run Ottawa (Tamarack Race Weekend)
Qualicum/Graham Park Community Association	Rideau Centre	Safe Wings Ottawa
Quartier Vanier	Rideau Speedeaus	Sail Canada
Queensway Carleton Hospital	Rideau Township Historical Society	Salus Ottawa
Queensway Terrace North Community Association	Rideau Valley Conservation Authority	Sandy Hill Community Health Centre
Queensway Terrace South Ridgeview Community Association	Rio Can Gatineau (640 Maloney) & RioCan La Gappe (51 boulevard de la Gappe)	Sarsfield Community Association
Queenswood Heights Community Association	Riverside Park Community and Recreation Association	Service Coordination Support
Rainbow Health Ontario	Riverside South Community Association	Service Intégration Travail Outaouais
Rainbow Rockers Curling	Riverview Park Community Association	Service régional d'interprétation visuelle de l'Outaouais
RCMP Headquarters (Representative 1)	Rockcliffe Airport (CYRO) and Sea Plane Base	Shepherds of Good Hope
RCMP Headquarters (Representative 2)	Rockcliffe Flying Club (RFC)-CTR7	Sierra Club Canada
RCMP Headquarters (Representative 3)	Rockcliffe Flying Club(RFC)-CTR7	Silver City Hull
RCMP Headquarters (Representative 4)	Rockcliffe Park Residents Association	SLOE (Sustainable Living Ottawa East)
Reach Canada	Rockcliffe Park Residents Association (Representative)	SmartCentres Kanata South (Terry Fox @ Fernbank)
REENA (Ontario Partnership on Aging and Developmental Disabilities) (X2)	Rockcliffe Yacht Club	SmartCentres Orleans I (Innes & Mer Bleue)
	Rockcliffe Yacht Club (Representative)	SmartCentres Orleans II (Innes & Mer Bleue)
		SmartCentres Ottawa South

SmartCentres Ottawa SouthWest	South Nation Conservation Authority	Table de concertation des aînés et retraités de l'Outaouais
Snow Pride	South West Stittsville Community Association	Tamir
Société Alzheimer de l'Outaouais québécois	Southgate Shopping Centre	Tanglewood Hillsdale Community Association
Société canadienne de la sclérose en plaques	Sparks Street	Tavern on the Hill
Société de Transport de l'Outaouais (STO)	Spinal Cord Injury Ontario	Tecumseh Area Residents Association
Société d'histoire de l'Outaouais	Stonebridge Community Association	Ten Oaks Project
Société d'histoire de l'Outaouais (Representative)	St Joe's Women Centre	Tewegan Housing for Aboriginal Youth
Société franco-ontarienne de l'autisme	St John Ambulance	The Canadian Centre for Gender and Sexual Diversity
Société franco-ontarienne du patrimoine et de l'histoire d'Orléans	St Laurent Mall	The Council of Ontario Construction Associations (COCA)
Somali Centre for Family Services	St Paul University - Dean - Canon Law	The Door Youth Centre
Somerset Street Chinatown	St Paul University - Dean - Human Sciences	The Greater Ottawa Truckers Association(GOTA)
Somerset Village	St Paul University - Dean - Theology	The Ontario Federation for Cerebral Palsy
Sonshine	St Paul University - Rector	The Ottawa Hospital
Soupe populaire de Hull inc.	St Paul University - Student Association	The Ottawa Mission
Soupière de l'Amitié de Gatineau inc.	Stittsville Village Association	The Petrie Island Marina (Oziles)
Source des jeunes	St-Laurent Academy (Private School)	Thorncliffe Village Community Association
South African High Commission	Suites Victoria	Tourism Industry Association of Ontario
South Keys	Sureté Québec	Tourisme Outaouais
South Keys Greenboro Community Association	Sustainable Eastern Ontario	
	Symmes Inn Museum	

Trans Canada Trail/The Great Trail	University of Ottawa – Deans of the Faculties - of Arts, Education, Engineering, Health Sciences, Law - Civil Law Section, Law - Common Law Section, Medicine, Science and Social Sciences	VIA Rail
Trans Outaouais		Ville de Gatineau - Gestion de Circulation (Representative)
Transport Action Canada		Ville de Gatineau - Info line
Transportation Association of Canada	University of Ottawa - Dean - Telfer	Ville de Gatineau (Representative)
Traversiers Bourbonnais (le traversier Masson-Cumberland)	University of Ottawa - General info line	Vision Centre-Ville Gatineau
Tree Canada	University of Ottawa - President and Vice-Chancellor	Vivre en Ville
Trend Arlington Community Association	University of Ottawa - Student Union & Pride Centre	Voice for deaf kids
tungasuvvingat Inuit	UQO - Association Étudiante	Wabano Centre
Turnbull School (Private School)	UQO - Communications	Walk Ottawa
UFWC Canada	UQO - Doyen - Gestion Académique	Wellington Village Community Association
Unions for bus drivers (Amalgamated Transit Union 279 Ottawa)	UQO - Doyenne - Études	Wellington West
United Way Eastern Ontario	UQO - Doyenne - Recherche et Création	West Barrhaven Community Association
University of Ottawa	UQO - Rectrice	West Way
University of Ottawa - Professor Geography, Environment and Geomatics	UQO - Secrétaire Général	Westboro Academy
University of Ottawa - Professor Ph.D. Associate Professor, Public and international Affairs. Faculty of Social Sciences. Research.	Valleystream Community Association	Westboro Community Association
University of Ottawa - Professor - Environmental Science	Vanier Community Association	Westboro Village
	Vars Community Association	Westcliffe Estates Community Association
	Vélo Canada Bikes	Whitehaven Community Association
	Vélo-Services	Winthrop Court Community House

Wisteria Park Community Association

Women's Business Network of Ottawa

Women's Initiatives for Safer Environments  
(WISE)

Women's Shelters Canada / Hébergement  
femmes Canada

Woodpark Community Association

Woodroffe North Community Association

Y newcomer information centre

Youth Ottawa

Youth Services Bureau of Ottawa

Youthline

Y's Owl Maclure Co-operative Centre

## Appendix B – Public Consultation Reports

Consultation 1A - October to December 2020 - Report is provided as a separate document. Available online at: <https://ncc-website-2.s3.amazonaws.com/documents/Alex-phase-1-Consultation-Report-EN-FINAL.pdf>

Consultation 1B – November to December 2021 – available online at [https://ncc-website-2.s3.amazonaws.com/documents/PA\\_Consultation-report\\_Alexandra-Bridge-Replacement\\_eKB-final-copy.pdf](https://ncc-website-2.s3.amazonaws.com/documents/PA_Consultation-report_Alexandra-Bridge-Replacement_eKB-final-copy.pdf) .



## Appendix C – Registry of Stakeholder groups and method of engagement

The Appendix is provided as a separate document.



## Appendix D – Indigenous Engagement Registry

The Appendix is provided as a separate document.





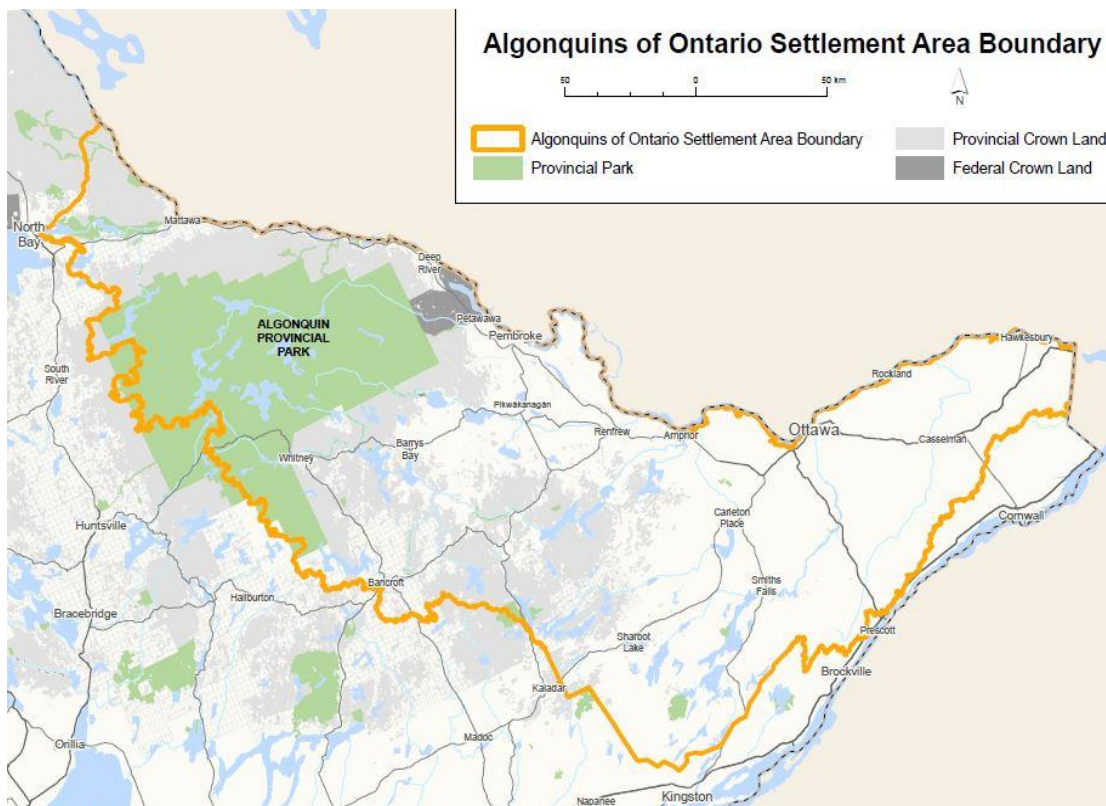
## Appendix E – Land Claims

### Land Claim and Modern Treaty Negotiation – Algonquins of Ontario

In 1983, the Algonquins of Pikwakanagan First Nation submitted a land claim to Canada and Ontario, asserting that it has Aboriginal rights and title that have never been extinguished, and has continuing ownership of the Ontario portions of the Ottawa and Mattawa River watersheds and their natural resources. The claim covers a territory of 36,000 square kilometers based largely on the watershed which was historically used and occupied by the Algonquin people and includes the location of the Alexandra Bridge.<sup>[1]</sup>

The claim was formally received in August 1985. The Province of Ontario accepted the claim for negotiations in 1991 and the Government of Canada joined the negotiations in 1992. A Framework for Negotiations was signed by the three parties in 1994.

The boundary of the Algonquin land claim is shown in the Figure F1 below.



**Figure F1: Algonquins of Ontario Settlement Area Boundary**

By 2004 it was agreed that the land claim and treaty negotiation process would be expanded to include representatives of historic Algonquin communities and territories in Ontario, in addition to the original claimants, the Algonquins of Pikwakanagan First Nation. This led to the creation of the Algonquins of Ontario (AOO) as the organization to provide a unified approach to reach a settlement of the land claim

and treaty. The agreement also stipulated how the AOO would identify people of Algonquin heritage as future beneficiaries to the claim and treaty.

The AOO is governed by representatives of ten Algonquin communities:

- Antoine
- Algonquins of Pikwakanagan First Nation
- Bonnechere
- Greater Golden Lake
- Kijicho Manito Madaouskarini (Bancroft)
- Mattawa/North Bay
- Ottawa
- Shabot Obaadjiwan (Sharbot Lake)
- Snimikobi (Ardoch)
- Whitney and Area.

The Algonquins of Pikwakanagan First Nation agreed to participate in the land claim and treaty process as part of the AOO structure with the understanding that it was solely for the purpose of the negotiations and that it would continue to have a direct relationship with the Government of Canada concerning all other Indigenous rights.

#### ***Algonquins of Ontario Consultation Process Interim Measures Agreement – 2009***

An agreement was signed on July 27, 2009 by the AOO, Ontario and Canada stipulating how Ontario and Canada would consult with the AOO on any “particular decision or activity that is applicable to the territory” during the claim and treaty negotiation process.<sup>[2]</sup>

The agreement called for the creation of the Algonquin Consultation Office, with funding from Ontario and Canada. Federal departments, provincial ministries, or other Crown agencies proposing a decision or activity applicable to the territory are to provide to the Algonquin Consultation Office appropriate notice and information of the proposed decision or activity.

This agreement continues to be in effect and its full text is available at:

<http://www.tanakiwin.com/wp-system/uploads/2013/10/10-Consultation-Process-Interim-Measures-Agreement-July-27-20091.pdf>

#### ***Agreement-in-Principle 2016***

An Agreement-in-Principle (AIP) between the AOO, Ontario and Canada was signed on October 18, 2016, following a ratification vote by Algonquin peoples earlier in 2016. The AIP was a major step towards an eventual Final Agreement that needs to be ratified by Algonquins and by the federal Parliament and provincial Legislature, after which it will take the form of a modern-day treaty setting out Algonquin Aboriginal and treaty rights protected under Section 35 of the Constitution Act, 1982.

The AIP sets out proposed key elements of a Final Agreement that would settle the Algonquin land claim, including:<sup>[3]</sup>

- \$300 million transfer to the Algonquins of Ontario
- transfer of approximately, but not less than, 117,500 acres of provincial Crown land to Algonquin ownership
- recommended approaches to address:
  - o Algonquin harvesting rights, including the right to harvest wildlife, fish, migratory birds and plants
  - o forestry
  - o parks and protected areas
  - o Algonquin heritage and culture
  - o Algonquin eligibility and enrolment.

<sup>[1]</sup> Government of Ontario, The Algonquin Land Claim, <https://www.ontario.ca/page/algonquin-land-claim>

<sup>[2]</sup> Consultation Process Interim Measure Agreement, 2009

<sup>[3]</sup> <https://www.ontario.ca/page/executive-summary-algonquins-ontario-proposed-agreement-principle>

### **Grandmothers Claim**

On March 2, 2017, Matriarch Jacqueline Sarazin and Grandmother Jane Chartrand on their own behalf and on behalf of the Kokomisag Tiji Pikwakanagan (traditional Grandmothers of Pikwakanagan) filed a claim against the Chief and Band Council of the Algonquins of Pikwakanagan and the Algonquins of Ontario and the Attorney General of Canada (the “Grandmothers Claim”). The Grandmothers are asserting rights the traditional title holders to the same lands covered by the Agreement-in-Principle as well as the lands that are the subject of the Kitigan Zibi Anishinabeg First Nation Claim. The Grandmothers are also contesting the authority of the AOO and the Chief of Pikwakanagan to represent the Algonquin Nation. The Grandmothers subsequently amended their Statement of Claim to add Windmill Dream Zibi, Master LP as a defendant party to the claim.

On February 13, 2018, Matriarch Jacqueline Sarazin, on behalf of the Grandmothers, commenced an application in Federal Court for judicial review (“JR”) of the Order-in-Council decision of December 5, 2017 that authorized the NCC to transfer certain lands and other interests located on Chaudière and Albert Islands to Windmill Developments as part of the Zibi Project. The respondent in the JR application is the Attorney General of Canada. The Zibi transactions closed in April 2018. The Grandmothers have since discontinued the JR and amended their Ontario Superior Court claim (i.e. the Grandmothers Claim) to include similar relief as contained in the JR application. This has consolidated the matters in one proceeding.

### **Land Claims, Assertions and Court Cases– Algonquin Nations of Quebec**

Algonquin Nations in Quebec have brought forward land claims, assertions and court cases concerning their interests in matters affecting their traditional territories in Quebec and Ontario, including the location of the Alexandra Bridge.

Individual Algonquins Nations in Québec have submitted initial comprehensive claims from 1985 to 1994, including claims by the Grand Lac Victoria Band (Kitcisakik) in 1985 and the River Desert

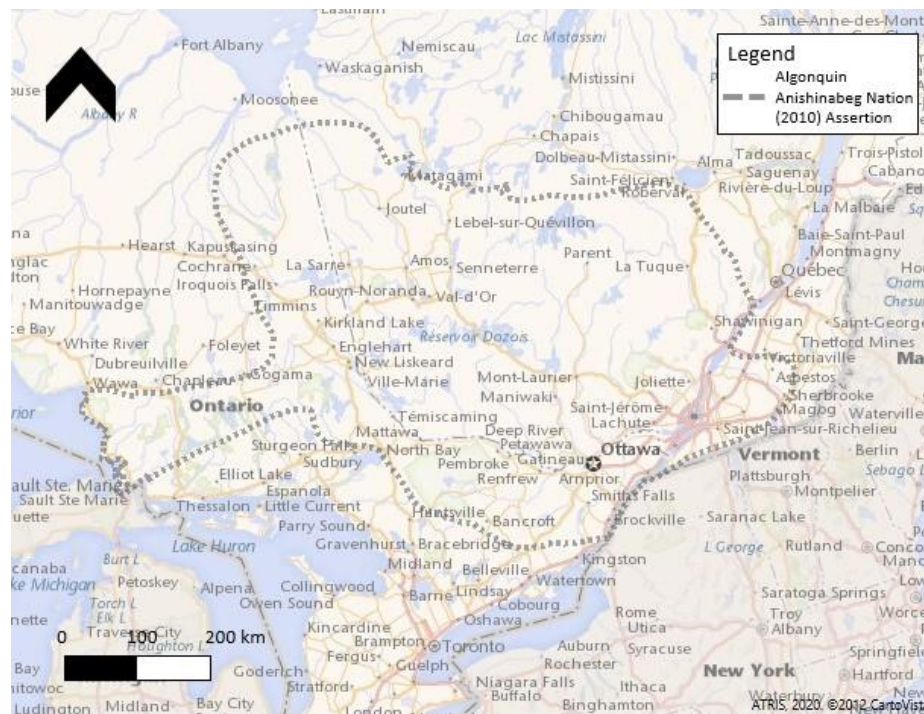
Band/Kitigan Zibi Anishinabeg First Nation in 1986, 1987, 1989, and 1994. These claims were not accepted for negotiation by the Minister of Indian Affairs.

### *Algonquin Nation Assertion of Rights (2010)*

On April 21, 2010, the seven Algonquin Nation members represented by the Algonquin Anishinabeg Nation Tribal Council submitted a statement regarding the assertion of their rights in their ancestral territory (the Nitakanin). These seven communities are Abitibiwinni — Pikogan, Eagle Village — Kipawa, Kitcisakik, Kitigan ZIBI, Lac Simon, Winnenay — Long Point and Wahgoshig.

The Tribal Council wants to establish a sharing formula that allows First Nations to have the right to utilize and co-manage the resources on the territory and for the member communities to profit from these resources. Algonquin communities also require that the duty to consult and accommodate is respected when Projects take place within the traditional territory.<sup>5</sup>

The Assertion of Rights identified the traditional territory shown in the Figure F2 below, including Western Quebec, Eastern Ontario, and portions of Northern Ontario extending to the southeast shore of Lake Superior.



**Figure F-2: Algonquin Nation Assertion of Rights (2010) Area**

<sup>5</sup> [Land and Resources | Algonquin Anishinabeg Nation \(anishinabenation.ca\)](#) accessed January 21, 2021

**Timiskaming, Wolf Lake and Eagle Village (Kebaowek First Nation) Statement of Assertion of Aboriginal Rights and Title (2013)**

On January 23, 2013, the Algonquin Nation Secretariat (ANS) submitted on behalf of Timiskaming, Wolf Lake and Eagle Village a declaration of their aboriginal rights and title over an area of 34,000 square kilometres of the Ottawa Valley, straddling the Ontario-Québec border shown in the Figure F3 below. The claimants stated they had never surrendered their Aboriginal rights and title by treaty or otherwise and have never authorized any Aboriginal group in Quebec or Ontario to negotiate for them in relation to such rights.<sup>6</sup>

This assertion of rights was made following research carried out in the context of the comprehensive land claim process. However, there has never been a formal submission as part of this process. This assertion of rights was presented in the context of the Crown obligations with respect with the duty to consult and for the purpose of establishing interim measures as a framework for potential treaty negotiations.



**Figure F-3: Timiskaming, Wolf Lake and Eagle Village (Kebaowek First Nation) Statement of Assertion of Aboriginal Rights and Title (2013)**

<sup>6</sup> Timiskaming, Wolf Lake and Eagle Village, Members of the Algonquin Nation, Statement of Assertion of Aboriginal Rights and Title, 11 January 2013

### *Kitigan Zibi Anishinabeg First Nation Claim (2016)*

On December 7, 2016, a court action on the Ontario Superior Court was commenced by the Kitigan Zibi Anishinabeg First Nation and Jean-Guy Whiteduck, on their own behalf and on behalf of all other members of the Algonquin Anishinabe Nation (“**AAN**”) against the Attorney General of Canada, the National Capital Commission and Her Majesty the Queen in Right of Ontario with respect to several parcels owned by Canada and/or the NCC including the Parliamentary Precinct, LeBreton Flats and the Islands (the “Kitigan Zibi Anishinabeg First Nation **Claim**”).

The plaintiffs in the Kitigan Zibi Anishinabeg First Nation Claim are seeking:

- an order appointing them as representatives of the AAN
- a declaration that the AAN has aboriginal title to certain lands in Ottawa which include Parliament Hill, the Supreme Court of Canada, other significant federal buildings, Victoria, Chaudière and Albert Islands and LeBreton Flats and
- a declaration that the AAN is entitled to the lands set out in the Kitigan Zibi Anishinabeg First Nation Claim or any portion of them.

Following the issuance of the Kitigan Zibi Anishinabeg First Nation Claim, the federal government entered into exploratory discussions with the Kitigan Zibi Anishinabeg First Nation and this led to the Kitigan Zibi Anishinabeg First Nation Claim being put in abeyance on October 17, 2017. The Kitigan Zibi Anishinabeg First Nation Claim remains in abeyance today.



## Appendix F – Environmental Studies Conducted in Project Area

No regional studies, as defined under Section 93 of the Impact Assessment Act, have been or are currently being conducted in the Project area.

The following studies have been conducted, or are in the process of being conducted, within the area surrounding the Project and are either publicly available or could be made available to the public on request. These studies (sorted alphabetically) provide information relevant to the environmental conditions in the area that will inform the various baseline studies to be completed as part of the Impact Assessment.

(1) Algonquins of Ontario. (2012). Returning Kichissippi Pimisi, the American Eel, to the Ottawa River Basin.

This report outlines the importance of the American Eel to Algonquin peoples using traditional knowledge.

(2) Casselman, J.M., Lehman, P., Marcogliese, L., & Oblak, J. (2011). *Fish, Fisheries, and Water Resources: Adapting to Ontario's Changing Climate: Study A1367*. Natural Resources Canada.

This study details the findings of review on research for fish populations in Ontario and adaptations to climate change. The review of existing research and conclusions allows the report to provide action items and recommendations for continuing database maintenance in order to contribute to protection, resilience, and conservation of fisheries and water resources. The area of focus is primarily on Lake Ontario, as well as the Mississippi River and watershed which is a tributary of the Ottawa River.

(3) CIMA+. (2016). Étude d'impact sur l'environnement: Agrandissement de la Marina de Hull à Gatineau.

Environmental Assessment for the expansion of the Hull Marina, completed for the Portage Champlain Yacht Club which is located adjacent to the bridge. Describes geology, groundwater, sediment, vegetation, and biological conditions as well as socioeconomic, archaeological, and other components for the Project site. Details anticipated environmental impacts of the Project and mitigation measures to address them.

(4) CIMA+. (2018). Terrestrial Natural Heritage Investigation, Nepean Point Redevelopment, Ottawa, Ontario.

Study of natural heritage features for an environmental assessment of the redevelopment of Kiweki Point (formerly named Nepean Point) (immediately adjacent to the Alexandra bridge on the Ontario side), completed for the National Capital Commission. Details important findings for natural heritage and recommendations for mitigation measures.

(5) City of Ottawa (2020). City of Ottawa Stormwater Management Outfall Rehabilitations.

The City of Ottawa is proposing the rehabilitation of six stormwater outfalls at five locations within the geographic limits of Ottawa, Ontario that exist within the urban area along the south shore of the Ottawa River. Outfall location OUT04452, approximately 600 m north of the Ontario side of the Alexandra Bridge, is located near Boteler Street and Bolton Street in Ottawa. Some of rehabilitation Project components that may impact the Project include the instillation of a temporary cofferdam, vegetation removals, excavation of existing material and minor regrading.

(6) Comtois, A., Chapleau, F., Renaud, C. B., Fournier, H., Campbell, B., Pariseau, R. (2004). Inventaire printanier d'une frayère multispécifique: l'ichtyofaune des rapides de la rivière Gatineau, Québec. *Canadian Field Naturalist* 118(4): 521-529.

Academic journal article that inventories the species of fish in the Gatineau River (a tributary of the Ottawa River) including documentation of the presence of certain species at risk.

(7) DST Consulting Engineers, Inc. (2003). *Environmental Assessment Screening for the Bridges Divestiture from PWGSC to the NCC: Chaudière Crossing, Alexandra Bridge, and Macdonald-Cartier Bridge*. Public Works and Government Services Canada.

A preliminary environmental assessment was conducted for the divestiture of three bridges (Alexandra Bridge, Chaudière Crossing, and Macdonald-Cartier Bridge) from PSPC to NCC. As part of the initial assessment, valued ecosystem components (VECs), cumulative effects, levels of significance, areas for future research, and mitigation measure plans were reported.

(8) DST Consulting Engineers Inc. (2013). *Designated Substances Survey: Alexandra Bridge, National Capital Area, Ontario*. Public Works and Government Services Canada.

A designated substances survey was conducted with visual inspection and sampling for the Alexandra Bridge. Based on the site investigation, sampling and analysis, the following Designated Substances and Hazardous Materials are present in forms and quantities expected to have a measurable impact on future work operations at the Alexandra Bridge: Asbestos-Containing Materials (ACMs) Lead Mercury PCBs and Silica.

(9) Environment and Climate Change Canada. (2018). *An Examination of Values, Existing Data, Potential Indicators, and Governance in the Ottawa River Watershed* (Draft).

This report provides information to inform work or interests in the Ottawa Watershed by providing a study of economic, heritage, cultural and natural values, indicators of change, and potential challenges for management. With a detailed review of past changes and impacts on diverse groups who rely on the Ottawa River watershed, data collection methods and future challenges are linked to potential approaches for integrated management.

(11) Gillis, N.C., Rapp, T., Hasler, C.T., Wachelka, H., and Cooke, J. (2010). Spatial ecology of adult muskellunge (*Esox masquinongy*) in the urban Ottawa reach of the historic Rideau Canal, Canada. *Aquatic Living Resources* 23(2): 225-230.



This study details the findings of seasonal movements and home range of muskellunge in the Ottawa reach of the Rideau Canal, which is one of the few wild urban muskellunge fisheries in North America supported by natural reproduction. Seasonal movements and home range of the muskellunge were found to be greatest during spring corresponding with the period when water levels in the canal are raised and muskellunge were presumed to be searching for suitable habitat. The study found that environmental influences such as seasonality and water depth (associated with canal operations) are believed to be the primary mechanisms contributing to habitat selection and movement patterns.

(12) Golder Associates Limited. (2005). *Draft Report on Geotechnical Assessment, Seismic Analysis, Alexandra Bridge*, Ottawa, ON. McCormick Rankin Corporation.

The report presents the findings of a geotechnical assessment performed for the Alexandra Bridge to assess seismic performance in accordance with factors outlined by the Canadian Highway Bridge Design Code (CHBDC). The soil and groundwater conditions of the bridge site are detailed, and results for seismic slope stability, abutment retaining walls, and site coefficient are presented.

(13) Groupe ABS. (2017). Étude géotechnique remise en état de service de divers sites touchés par les inondations de 2017, sentier des Voyageurs.

Geotechnical study of the Voyageurs pathway in Gatineau following flooding in 2017, completed for the National Capital Commission that details geological characteristics near the pathway and provides recommendations for remediation.

(14) Haxton, T., & Chubbuck, D. (2002). Review of the historical and existing natural environment and resource uses on the Ottawa River. Ontario Ministry of Natural Resources, Science and Information Branch, Southcentral Science and Information Section Technical Report #119.

Describes the Ottawa River section by section detailing the historical development and natural resource uses existing wildlife and unique species (often at-risk) wetlands, parks, environmentally significant areas and the hydrology and chemical characteristics.

(15) Intera Engineering Ltd. (2007). Phase II Environmental Site Assessment, Nepean Point, Property Asset #96254, Ottawa, Ontario.

Study of soil and groundwater quality/contamination at Kìwekì Point (formerly named Nepean Point) as part of a Phase II ESA. The point is located next to the Alexandra Bridge structure on the Ontario side. Some exceedances are described.

(16) Kilgour & Associates Limited. (2013). *Ottawa River Shoreline Works: Fish and Fish Habitat Risk Assessment*: Draft Report. National Capital Commission.

This document is a fish and fish habitat risk assessment for works along the Ottawa River shoreline on the northern side of the Parliament buildings in downtown Ottawa. This area is very near to the Alexandra Bridge. Fish habitat in this area was found to be degraded and rehabilitation efforts would be required in order for fish to use the area for spawning or rearing activities.

(17) McCormick Rankin Corporation. (2006). *Réhabilitation du pont Alexandra. Rapport d'évaluation environnementale.* Ottawa, Ontario.

This report outlines the possible environmental effects that could occur during a bridge rehabilitation. The findings are that the Project is not likely to lead to any negative effects on the environment. Although from 2006, this report is focused on the Alexandra Bridge and surrounding area.

(18) MMM Group Limited (McCormick Rankin) & CIMA+ S.E.N.C (MRC-CIMA+) (2012). *Macdonald-Cartier Bridge Rehabilitation Designated Substances Report – Project No. R.005066.503.* Public Works and Government Services Canada.

Report on the findings of designated substances and hazardous materials on the Macdonald-Cartier Bridge in advance of rehabilitation work to be performed. The findings list substances identified as well as work activities classified by their level of risk in terms of substance impacts or interaction.

(19) MNRF (2016) *Background Information to the Fisheries Management Plan for the Ottawa River – Fisheries Management Zone 12 in Ontario, Fisheries Management Zone 25 in Quebec.*

Report discusses the ten reaches of Fisheries Management Zone 12 (Ottawa River) and provides a description of species found and relative abundances in each of the 10 reaches. The report was a precursor to the Fisheries Management Plan for the Ottawa River.

(20) OMNRF and MFFPQ. (2018) *Fisheries Management Plan for the Ottawa River.*

This Fisheries Management Plan replaces the Strategic Fisheries Management Framework for the Ottawa River originally implemented in 1999. It is intended to help the Ontario and Quebec government agencies in working together to manage fisheries of the Ottawa River consistently. The Plan identifies monitoring that will take place to ensure that progress is being made towards the management objectives and targets.

(21) National Capital Commission. (2005). *Canada's Capital Core Area Sector Plan.* National Capital Commission: Ottawa, Canada.

This plan envisioned the sustainable development of the capital region with the use of a Strategic Environmental Assessment. The plan highlighted the need for integration of knowledge and efforts from all levels of government, as well as the establishment of initiatives and interventions. This plan focused on many aspects of key features in the downtown core, including the Alexandra Bridge.

(22) National Capital Commission. (November 2007). *Canada's Capital Views Protection.* National Capital Commission: Ottawa, Canada.

This report focuses on the maintenance of views in Canada's Capital, particularly pertaining to National Symbols and height control. The aim of the information was to guide policy and future development with consideration to key aspects of the protection study findings. The Alexandra Bridge boardwalk represents a four viewpoint sequence for consideration in design control.

(23) National Capital Commission. (2008). Guide for the Management of Archaeological Resources. National Capital Commission: Ottawa, Canada.

This purpose is to guide and prepare Project managers who are responsible for Projects that may have an impact on archaeological resources. The policies and legislation included are aimed at protecting these resources. The document is created by the NCC for use on NCC lands.

(24) National Capital Commission. (2011). Draft 90%, Confederation Boulevard Guidelines. National Capital Commission: Ottawa, Canada.

(25) National Capital Commission. (2017). Capital Illumination Plan. National Capital Commission: Ottawa, Canada.

In the Illumination Plan, lighting is discussed as an urban strategy for showcasing the identity of the National Capital Region. The aims of the plan are to enhance the Capital's nighttime beauty and promote sustainable development. The plan found that Alexandra Bridge, a landmark in the daytime, was not showcased at night with current lighting fixtures.

(26) National Capital Commission. (2017). The Plan for Canada's Capital: 2017-2067. National Capital Commission: Ottawa, Canada. <http://capital2067.ca/wp-content/uploads/2017/05/PFCC-English-complete-optimized.pdf>

(27) National Capital Commission. (April 2018). Ottawa River North Shore Parklands Plan. National Capital Commission: Ottawa, Canada.

This report is to serve as a guide when making decisions for development Projects and activities on federal lands with a long term vision in mind. Report includes general and detailed policies governing development in the area. The focus area is Hull Island which is connected to Alexandra Bridge.

(28) National Capital Commission. (2018). Sustainable Development Strategy: 2018 -2023. National Capital Commission: Ottawa, Canada.

The NCC is voluntarily adopting the Federal Sustainable Development Strategy in order to play a role in greening Canada's Capital. This report outlines what the goals are, as well as strategies to attain the successes. Alexandra Bridge is in the NCA.

(29) National Capital Commission. (2020). Capital Pathway Strategic Plan. National Capital Commission: Ottawa, Canada.

The Capital Pathway is over 200km of multi-use pathways through the region and the report outlines how it will be planned for the next 30 years. It addresses new challenges that were not present at the initial stage of development 50 years ago. Sections of the pathway run adjacent to the Ottawa River and Canal.

(30) Parsons. (2015). Minto Bridges East and Centre Rehabilitation: Non-Basic Environmental Effects Evaluation.

Non-Basic Environmental Effects Evaluation (EEE) for the rehabilitation of the Minto Bridges (constructed in 1900), located approximately 1km away from the Alexandra Bridge. EEE document details the ecological characteristics (fauna, vegetation, species-at-risk), baseline environmental conditions, Project actions and mitigation measures.

(31) Parsons. (2020). Feasibility Study on the use of Alexandra Bridge for an Interprovincial Public Transit system in the Capital Core Area

(32) Pérusse, M., Lambert, D., Duguay, S. (2017). *Timiskaming Complex: Replacement of the Quebec Dam – Fish Census Summary – Fall 2017*. Tetra Tech.

A summary of the fish census component of the Environmental Effects Evaluation for the Timiskaming Quebec Dam Replacement performed in the fall of 2017. The report identifies fish species found in the Ottawa River and whether they had been recorded in past studies, as well as spawning probabilities linked with flow conditions near the dam site.

(33) Price Waterhouse Cooper (2020). Alexandra Bridge Replacement Project: Market Sounding Report.

(34) Public Service and Procurement Canada. (2014). Mitigation Measures Form: Alexandra Bridge Security Fence Installation.

This is the Mitigation Measures Form (MMF) for security fence installation on the shoreline around the abutment of the Alexandra Bridge on the Ottawa side of the Ottawa river. The MMF outlines basic Project classification, a detailed Project description, and potential environmental effects and corresponding mitigation measures.

(35) Public Services and Procurement Canada. (2016). Environmental Decision Record: PSPC Alexandra Bridge Area Coating for Piers 2 and 3, Ottawa, ON.

Environmental decision record for a protective coating Project for piers 2 and 3 on the Alexandra Bridge. Details the Project description and location, anticipated environmental effects, and corresponding mitigation measures.

(36) Public Services and Procurement Canada. (2019). Mitigation Measures Form: Superstructure Steel Replacement.

Mitigation Measures Form (MMF) for the superstructure steel replacement on the Alexandra Bridge, intended to strengthen and/or replace corroding steel members. MMF outlines Project description and classification, Project description, potential environmental effects, and corresponding mitigation measures.

(37) Public Works and Government Services Canada. (2001). *Environmental Assessment Screening for the Installation of Signs on the Northwest and Southeast Approaches to the Macdonald-Cartier Bridge at Hull, Quebec and Ottawa, Ontario: Project No. 431792*.

An investigation was performed for the requirement of an Environmental Assessment (EA) for the installation of signage at the northwest and southeast approaches to the Macdonald Cartier Bridge in

accordance with requirements of the Canadian Environmental Assessment Act (CEAA). The Project was found not to have significant environmental effects with the implementation of mitigation measures and given the low sensitivity of biophysical and social components implicated in the Project.

(38) Public Works and Government Services Canada: Office of Greening Governmental Operations. (2006). *Strategic Environmental Assessment Divestiture of Chaudière Crossing Part 2-11*. Public Works and Government Services Canada: Owner-Investor.

A Strategic Environmental Assessment (SEA) was conducted in advance of the divestiture of three bridges in Ottawa, including the Chaudière Crossing. In the Environmental Setting section, the following information was provided:

Species of Concern: A nesting pair of Peregrine Falcons (subspecies anatum) lives in downtown Ottawa, west of the Rideau River. These birds are protected under Schedule 1, Part 3 of the Species at Risk Act. The River Redhorse (designated as a Species of Special Concern under Schedule 3 of the Species at Risk Act) has been reported to frequent the Ottawa River. Other wildlife of concern in the area include migratory birds and fish, protected under the Migratory Birds Convention Act and the Fisheries Act.

(39) Public Works and Government Services Canada: Office of Greening Governmental Operations. (2006). *Strategic Environmental Assessment Divestiture of Alexandra Bridge Part 2-12*. Public Works and Government Services Canada: Owner-Investor.

A Strategic Environmental Assessment (SEA) was conducted in advance of the divestiture of three bridges in Ottawa, including the Alexandra Bridge. In the Environmental Setting section, the following information was provided:

Species of Concern: A nesting pair of Peregrine Falcons (subspecies anatum) lives in downtown Ottawa, west of the Rideau River. These birds are protected under Schedule 1, Part 3 of the Species at Risk Act. The River Redhorse (designated as a Species of Special Concern under Schedule 3 of the Species at Risk Act) has been reported to frequent the Ottawa River. Other wildlife of concern in the area include migratory birds and fish, protected under the Migratory Birds Convention Act and the Fisheries Act.

(40) Public Works and Government Services Canada: Office of Greening Governmental Operations. (2006). *Strategic Environmental Assessment Divestiture of Macdonald-Cartier Bridge Part 2-13*. Public Works and Government Services Canada: Owner-Investor.

A Strategic Environmental Assessment (SEA) was conducted in advance of the divestiture of three bridges in Ottawa, including the Macdonald-Cartier Bridge. In the Environmental Setting section, the following information was provided:

Species of Concern: A nesting pair of Peregrine Falcons (subspecies anatum) lives in downtown Ottawa, west of the Rideau River. These birds are protected under Schedule 1, Part 3 of the Species at Risk Act. The River Redhorse (designated as a Species of Special Concern under Schedule 3 of the Species at Risk Act) has been reported to frequent the Ottawa River. Other wildlife of concern in the area include migratory birds and fish, protected under the Migratory Birds Convention Act and the Fisheries Act.

(41) Public Works and Government Services Canada. (2010). *Species at Risk in Ottawa*.

A list of species at risk in Ottawa. This list was created for reference and was last updated in 2010.

(42) Public Works and Government Services Canada. (2012). *Preliminary Identification of Environmental Services Required: Alexandra Bridge Bearing Painting*.

In advance of bearing painting on the Alexandra Bridge, a Preliminary Identification of Environmental Services Required (PIESR) was completed by Environmental Services at Public Works and Government Services Canada to identify areas where environmental mitigation activities might be required. The property had been classified E under PWGSC Species at Risk Protocol, which indicates that the probability of the presence of a natural habitat is very low, and/or non-existent.

(43) Public Works and Government Services Canada. (2017). *Preliminary Identification of Environmental Services Required: Portage Channel Bridge – Barriers & Attenuators*.

In advance of repair work on the Portage Channel Bridge on the French River in Dokis, ON, this PIESR was created by PWGSC to address environmental aspects for consideration. In this assessment, the prime breeding season for birds was noted to be from April 15th to August 15th. A breeding bird survey of the area (conducted by a qualified avian biologist) was recommended prior to the work to avoid/limit bird nests to be disturbed/destroyed.

(44) Trow Associates Inc. (2008). *Phase I Environmental Site Assessment, Jacques-Cartier Park South, Gatineau, Quebec*.

Phase I ESA investigates the environmental site conditions at Jacques-Cartier Park South for the modification of the ramp and dock wall.

(45) Trow Associates Inc. (2008). *Phase II Environmental Site Assessment, Jacques-Cartier Park South, Gatineau, Quebec*.

Study of groundwater and soil quality/contamination at Jacques-Cartier Park South as part of a Phase II environmental assessment for the modification of the ramp and dock wall. Some exceedances are described in soil samples and groundwater samples.

(46) URS Canada Corp. 2010. *Heritage Value Assessment Report*.

This heritage value assessment report includes an environmental and built heritage feature review of the Alexandra Bridge. The report provides a statement of heritage values and identification of character-defining elements. In addition, general conservation guidelines and recommendations, historical maps, photographs and drawings and a detailed chronology of the construction of the bridge and subsequent interventions is included in the report.

(47) WSP. (2014). *Caractérisation des berges de la rivière des Outaouais. Revue de littérature*. Prepared for the National Capital Commission.

Thirteen (13) sites were identified along the shorelines of the Ottawa River on both Quebec and Ontario sides. The objective of the study is to conduct a literature review on the natural environment of the selected sites, to establish their environmental sensitivity and the availability of environmental information for each site. This will allow the identification of the sites to be prioritized for future field investigations.

(48) WSP. (2015). Caractérisation des berges de la rivière des Outaouais. Inventaires de terrain. Prepared for the National Capital Commission.

Five sites were characterized along the Quebec and Ontario shoreline of the Ottawa River: the northern part of the island (sector 1), the Jacques-Cartier Park and Charron House (Sector 2), the Scott Point (sector 3), the Parc des Portageurs (area 4) and the Westboro Beach (Area 5). The sites were selected following a literature review (WSP, 2014), which identified shoreline portions with low to very high ecological sensitivity and where ecological environmental information was absent. Studied components include watercourses, terrestrial vegetation, wetlands, federal species at risk and provincial threatened or vulnerable species.

(49) WSP Canada Inc. (2018). Étude écologique et caractérisation de l'habitat du poisson aménagés de stabilisation, sentier des Voyageurs, Gatineau (QC).

Ecological study and fish habitat characterization for the Voyageurs pathway in Gatineau, completed for the National Capital Commission. Details existing flora, fauna, and fish species and describes fish habitat characteristics.

(50) WSP Canada Inc. (2019). *MÉMORANDUM TECHNIQUE – Mise à jour du rapport sur la faune ichthyenne et les habitat aquatiques – Étude d'évaluation environnementale des liaison interprovinciales*



## Appendix G – NCC Planning and Design Requirements

Alexandra Bridge Replacement Planning and Design Principles (2021) available online at: [https://ncc-website-2.s3.amazonaws.com/documents/Alexandra-Bridge-Replacement-Design-Guidelines\\_E\\_2021.06.11\\_small.pdf](https://ncc-website-2.s3.amazonaws.com/documents/Alexandra-Bridge-Replacement-Design-Guidelines_E_2021.06.11_small.pdf)

Alexandra Bridge Replacement Performance Criteria for Bridge Design (2022) available online at: [https://ncc-website-2.s3.amazonaws.com/documents/2022-08-05\\_NCC\\_AB\\_Pages\\_EN.pdf](https://ncc-website-2.s3.amazonaws.com/documents/2022-08-05_NCC_AB_Pages_EN.pdf)

The documents are provided separately.





## Appendix H – List of Species in Project Area

Scientific Name	Common Name	Status - Canada <sup>7</sup>	Status - Ontario <sup>8</sup>	Status - Quebec <sup>9</sup>
<b>Vegetation</b>				
<i>Acer nigrum</i>	Black Maple	n.s. <sup>10</sup>	n.s.	Vulnerable
<i>Fraxinus nigra</i>	Black Ash	COSEWIC <sup>11</sup> – Threatened (under consideration for addition to Schedule 1)	Endangered	n.s.
<i>Juglans cinerea</i>	Butternut	Endangered	Endangered	Likely to be designated
<i>Matteuccia struthiopteris</i>	Ostrich Fern	n.s.	n.s.	Vulnerable to harvest
<i>Panax quinquefolius</i>	American Ginseng	Endangered	Endangered	Threatened
<i>Rhus aromatica var. aromatica</i>	Fragrant Sumac	n.s.	n.s.	Vulnerable
<i>Ulmus thomasii</i>	Rock Elm	n.s.	n.s.	Threatened
<b>Terrestrial Invertebrates</b>				
<i>Bombus terricola</i>	Yellow-banded Bumble Bee	Special Concern	Special Concern	Likely to be designated
<i>Danaus plexippus</i>	Monarch	Special Concern	Special Concern	n.s.

<sup>7</sup> Designated under the *Species at Risk Act* (SARA)

<sup>8</sup> Designated under the *Endangered Species Act, 2007* (ESA)

<sup>9</sup> Designated under the *Act respecting threatened or vulnerable species* (ARTVS)

<sup>10</sup> n.s.: No status

<sup>11</sup> COSEWIC: Committee on the Status of Endangered Wildlife in Canada

Scientific Name	Common Name	Status - Canada <sup>7</sup>	Status - Ontario <sup>8</sup>	Status - Quebec <sup>9</sup>
<b>Fish &amp; Aquatic Invertebrates</b>				
<i>Acipenser fulvescens</i>	Lake Sturgeon (Great Lakes – Upper St. Lawrence populations)	COSEWIC – Threatened (under consideration for addition to Schedule 1)	Endangered	Likely to be designated
<i>Ameiurus natalis</i>	Yellow Bullhead	n.s.	n.s.	Likely to be designated
<i>Anguilla rostrata</i>	American Eel	COSEWIC – Threatened (under consideration for addition to Schedule 1)	Endangered	Likely to be designated
<i>Exoglossum maxillingua</i>	Cutlip Minnow	Special Concern	Threatened	n.s.
<i>Hybognathus regius</i>	Eastern Silvery Minnow	Not at Risk	n.s. (ranked as S2 - at risk in the province by the NHIC <sup>12</sup> )	n.s.
<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey (Great Lakes – Upper St. Lawrence populations)	Special Concern	Special Concern	Threatened
<i>Ichthyomyzon unicuspis</i>	Silver Lamprey (Great Lakes – Upper St. Lawrence populations)	Special Concern	Special Concern	n.s. (under review)
<i>Lepomis peltastes</i>	Northern Sunfish (Great Lakes – Upper St. Lawrence populations)	Special Concern	Special Concern	Likely to be designated
<i>Moxostoma carinatum</i>	River Redhorse	Special Concern	Special Concern	Vulnerable

<sup>12</sup> Natural Heritage Information Centre



Scientific Name	Common Name	Status - Canada <sup>7</sup>	Status - Ontario <sup>8</sup>	Status - Quebec <sup>9</sup>
<i>Obovaria olivaria</i>	Hickorynut (freshwater mussel)	Endangered	Endangered	Likely to be designated (in the process of being designated as threatened)
<i>Percina copelandi</i>	Channel Darter (St. Lawrence populations)	Special Concern	Special Concern	Vulnerable
<b>Amphibians</b>				
<i>Lithobates palustris</i>	Pickerel Frog	n.s.	n.s.	Likely to be designated
<i>Pseudacris triseriata</i>	Western Chorus Frog (Great Lakes / St. Lawrence – Canadian Shield population)	Threatened	n.s.	Vulnerable (in the process of being designated as threatened)
<b>Reptiles</b>				
<b>Snakes</b>				
<i>Lampropeltis triangulum</i>	Eastern Milksnake	Special Concern	n.s.	Likely to be designated (in the process of being designated as vulnerable)
<i>Nerodia sipedon sipedon</i>	Northern Watersnake	Not at Risk	n.s.	Likely to be designated (in the process of being designated as vulnerable)
<b>Turtles</b>				
<i>Apalone spinifera</i>	Spiny Softshell (turtle)	Endangered	Endangered	Threatened
<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	n.s.
<i>Chrysemys picta marginata</i>	Midland Painted Turtle	Special Concern	Not at risk	n.s.
<i>Emydoidea blandingii</i>	Blanding's Turtle (Great Lakes / St. Lawrence population)	Endangered	Threatened	Threatened

Scientific Name	Common Name	Status - Canada <sup>7</sup>	Status - Ontario <sup>8</sup>	Status - Quebec <sup>9</sup>
<i>Graptemys geographica</i>	Northern Map Turtle	Special Concern	Special Concern	Vulnerable
<i>Sternotherus odoratus</i>	Eastern Musk Turtle	Special Concern	Special Concern	Threatened
<b>Birds</b>				
<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Likely to be designated (in the process of being designated as threatened)
<i>Chordeiles minor</i>	Common Nighthawk	Threatened (under consideration for status change to Special Concern)	Special Concern	Likely to be designated
<i>Contopus virens</i>	Eastern Wood-pewee	Special Concern	Special Concern	n.s.
<i>Falco peregrinus anatum / tundrius</i>	Peregrine Falcon anatum / tundrius	Special Concern (under consideration for status change to Not at Risk)	Special Concern	Vulnerable
<i>Hirundo rustica</i>	Barn Swallow	Threatened	Threatened (downgraded to special concern by COSSARO <sup>13</sup> )	n.s.
<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	n.s.
<b>Mammals</b>				
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	n.s.	n.s.	Likely to be designated
<i>Myotis leibii</i>	Eastern Small-footed Myotis (bat)	n.s.	Endangered	Likely to be designated
<i>Myotis lucifugus</i>	Little Brown Myotis (bat)	Endangered	Endangered	n.s.

<sup>13</sup> COSSARO: Committee on the Status of Species at Risk in Ontario



Scientific Name	Common Name	Status - Canada <sup>7</sup>	Status - Ontario <sup>8</sup>	Status - Quebec <sup>9</sup>
				(in the process of being designated as threatened)
<i>Myotis septentrionalis</i>	Northern Myotis (bat)	Endangered	Endangered	n.s. (in the process of being designated as threatened)
<i>Perimyotis subflavus</i>	Tri-coloured Myotis (bat)	Endangered	Endangered	Likely to be designated (in the process of being designated as threatened)

**Notes:**

**Federal and Ontario species ranking definitions:**

Endangered - a wildlife species facing imminent extirpation or extinction

Threatened - a wildlife species likely to become endangered if limiting factors are not reversed.

Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified traits

Not at Risk - a wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances

**Quebec species listing definitions:**

Threatened (menacée) - a species, subspecies or population whose survival is considered precarious

Vulnerable (vulnérable) - species, subspecies or population whose extinction is apprehended

Likely (susceptible) - species that may be designated as threatened or vulnerable

