Appendix A

Gap Analysis Memorandum

Environmental Assessment Gap Analysis Memorandum

Runway End Safety Area, Billy Bishop Toronto City Airport

PortsToronto

60733457

October 2025

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AECOM: 2024-12-21

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Distribution List

# Hard Copies	PDF Required	Association / Company Name
-	✓	PortsToronto
-	✓	Avia NG Airport Consultants

Land Acknowledgement

Billy Bishop Toronto City Airport operates under its mandate on the traditional territory of many nations, including the Mississaugas of the Credit, the Chippewa, the Haudenosaunee, and the Wendat peoples, and is now home to many diverse First Nations, Inuit and Métis peoples. We respect that the Crown and Mississaugas of the Credit signed Treaty 13, which covers the lands of the City of Toronto. Today, Toronto is still home to Indigenous people and we are grateful to have the opportunity to meet and work on this territory.

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Acronyms and Abbreviations

RESA ..... Runway End Safety Area

1. Introduction

AECOM Canada ULC, herein after referred to as “AECOM”, has been retained by Avia NG Inc. (Avia NG) to complete a Gap Analysis and Environmental Assessment for implementation of the Runway End Safety Area (RESA) at Billy Bishop Toronto City Airport (‘the Project’).

On December 21, 2021, Canadian Aviation Regulations, Subsection 300.01 – RESA[1] came into effect, and on January 5, 2022 Transport Canada published these regulations that mandate Canadian certified aerodromes to extend their current RESAs from the existing minimum 60 metres to a minimum length of 150 metres for existing and future runways. This regulation specifically applies to runways serving scheduled passenger air services. Runway 08/26 at Billy Bishop Toronto City Airport falls under this requirement. In response, PortsToronto initiated a Runway 08/26 RESA Alternatives Study to understand the impacts of RESA compliance for Runway 08/26. The 2018 Airport Master Plan had planned for and anticipated the need for RESA on Runway 08/26. As such, PortsToronto and its consultants leading the master plan, presented options that could be considered for compliance with RESA regulatory requirements by consulting with stakeholders, agencies including Indigenous communities, and the public at information centres/community meetings.

Avia NG completed the Runway 08/26 RESA Alternatives Study for PortsToronto in April 2024 (Rev.1, April 2024), which considered six RESA alternatives. These ranged from non-physical compliance methods to optimizing existing land and creating new landmass and breakwaters. They were assessed at a high level for design complexity, implementation ease, marine navigation, environmental and community effects, permitting, and cost. The RESA alternatives assessed will not alter runway operations, capacity, or aircraft types. The boundaries and size of the existing Marine Exclusion Zone will also remain unchanged. Some of the alternatives will enable ancillary safety, environmental and community benefits through more efficient use of taxiways, noise walls and unrestricted perimeter airside road access around the runway ends. Similar to the pedestrian tunnel project where PortsToronto allotted for servicing tunnels for City of Toronto utilities, consideration of municipal infrastructure servicing is being considered for some of these alternatives based on utility supply requirements.

1. According to Subsection 300.01 Canadian Aviation Regulations , RESA or runway end safety area means an area, adjacent to or on a runway that is intended to reduce the severity of damage to an aeroplane in the event that the aeroplane undershoots or overruns the runway. For more details on RESA, refer to Section 3 of this report.

AECOM is using the Avia NG Alternative Study 2024 as the technical baseline for site planning and Transport Canada compliant facility layouts for the Gap Analysis and the RESA Environmental Assessment to identify the preferred RESA alternative.

1.1 Project Background

In 2013, Porter Airlines requested the City of Toronto to consider allowing jets at the airport, promoting potential amendment to the Tripartite Agreement governing the Billy Bishop Toronto City Airport. The City of Toronto undertook a review of the potential effects of the introduction of runway jets in 2013 and 2014, in response to Porter's request. In consideration of the outcome of the City's review and concerns raised by the public regarding existing airport operations, the City requested, among other measures, the completion of an Environmental Assessment for introduction of jets and extensions of the runway (AECOM 2017). PortsToronto subsequently initiated an Environmental Assessment study encompassing a range of studies, including air quality, archaeology and cultural heritage, land use and built form, natural environment, marine navigation, marine physical conditions and water quality, noise, health, socio-economic conditions, and transportation. These studies were designed to meet both Federal and Provincial Environmental Assessment requirements through a hybrid environmental assessment process, which was peer reviewed by agency, stakeholder and community representatives, funded by PortsToronto and facilitated by Waterfront Toronto. The study initially involved designing the study framework, contributing to work plans, and engaging in consultations, followed by detailed technical studies ('Study Design Report'). City staff reviewed and provided detailed comments on the Draft Study Design Report, as documented in a letter to PortsToronto dated June 1, 2015. Table 1-1 provides a summary of City's comments on 2015 Study Design Report. (see **Appendix A** for the letter). The City comments were acknowledged by PortsToronto, and considered into the Environmental Assessment study for introduction of jets and runway extensions at Billy Bishop Toronto City Airport. The City of Toronto continued to be actively involved in the Environmental Assessment process by participating in the Agency Advisory Committee . While there was no formal endorsement of the Environmental Assessment from the City, the Agency Advisory Committee provided a platform for the City to share their perspectives and offer advice to PortsToronto at key points throughout the Environmental Assessment process.

In November 2015, the Transport Minister announced that their government would not amend the Tripartite Agreement to lift the jet ban at Billy Bishop Toronto City Airport. In light of this announcement, PortsToronto made the decision not to proceed with further public engagement related activities pertaining to the Porter proposal to introduce jets. However, PortsToronto proceeded to finalize the technical studies, compiling them into an Environmental Assessment report completed by AECOM in 2017, referred to as the

"AECOM 2017 Environmental Assessment." This report evaluated the environmental impacts of introducing jet aircraft and extending the runway by 200m on each end, assessing the net effects on Billy Bishop Toronto City Airport.

The AECOM 2017 Environmental Assessment was not subject to the Federal or Provincial Environmental Assessment Acts or the Municipal Class Environmental Assessment process. However, due to the proposal's location on land partly owned by Transport Canada, it fell under Section 67 of the Canadian Environmental Assessment Act, 2012. PortsToronto' s position was that the AECOM 2017 Environmental Assessment met the requirements outlined in Section 67 of the Canadian Environmental Assessment Act, 2012, employing a hybrid approach covering both Federal and Provincial Environmental Assessment requirements.

Since then, PortsToronto has engaged with Transport Canada, Department of Fisheries and Oceans Canada, Toronto and Region Conservation Authority, and waterfront stakeholders, pursuing further studies across various disciplines to better understand the environment and community impacts around the airport.

PortsToronto is now planning to implement RESAs on Runway 08/26 to comply with new Canadian Aviation Regulations, addressing safety recommendations identified by the Transportation Safety Board of Canada for airports in Canada. While there are two runways at the airport, RESA requirements only apply to the primary Runway 08/26 since it is the only runway that is engaged in scheduled air service for the purpose of carrying passengers.

Table 1-1: City of Toronto Summary Comments on the 2015 Study Design Report

Topic	Summary Comments
Proposed Environmental Assessment Study Design and Scope	■ City staff expressed strong interest in understanding potential impacts of airport growth under existing and expanded operations. ■ A “Do Nothing” scenario should assess existing conditions without improvements to airside and groundside operations, incorporating issues raised by the city and local community (e.g., groundside traffic, noise, air quality) under baseline conditions. ■ The 'Proposed Growth' Scenario, which includes jet-powered aircraft, runway extensions, and increased daily slots, differs from the city-approved caps and phasing framework, raising some concerns about the feasibility of realistically accommodating this growth. ■ Environmental Assessment scoping document should clearly describe the project, including the 2012 permitted and 2015 proposed growth scenarios, and specify project design standards to clarify the scope. ■ Environmental Assessment is required for City Council approval of runway extensions and jets before considering changes to the Tripartite Agreement. The Airport Master Plan Update should be drafted and circulated before completing the Environmental Assessment, with agreement needed on Billy Bishop Toronto City Airport's vision, role, and future aviation volumes and forecast. ■ The impacts on general aviation users in scenarios with jet-powered aircraft, runway extensions, and increased commercial slots and passenger volumes should be identified. ■ Recommendation on expanding the study area beyond the limit of key waterfront receptors to include the six Wards studied by others in 2013, or provide a rationale for why the larger study area is no longer needed.
Transportation	■ The Environmental Assessment must clearly demonstrate its connection to other related studies, including the Bathurst Quay Neighbourhood Plan (their assumptions on airport growth) and the Airport Master Update. ■ Any Environmental Assessment exceeding the City Council-approved caps and phasing framework for vehicle capacity around the airport must acknowledge existing conditions, assess accommodation for additional passengers and traffic, and show no greater impact on current traffic conditions. ■ Extend Transportation Assessment boundary to consider the potential impact on transit service in a broader area.
Air Quality	■ Utilize the City's air quality model data for baseline. ■ Conduct local and site-specific sensitive receptor air quality monitoring. ■ Model related land vehicle traffic, including congestion and idling emissions. ■ Address limitations of existing monitoring data from Ministry of Environment and National Air Pollution Surveillance stations. ■ Address air quality and odours from fuel storage and unburnt fuel. ■ Assess deposited materials (black soot) in the vicinity of Billy Bishop Toronto City Airport.
Noise	■ Include noise measurements at key sensitive locations, including short-duration noise. ■ Assess noise impacts on indoor environments, especially sensitive settings like the waterfront school.
Public Health	■ Compare noise modelling/measurements with health-based noise guidelines. ■ Evaluate Air Quality impacts against health-based carcinogenic and non-carcinogenic benchmarks. ■ Consider acute exposure evaluation for intense airport activity periods. ■ Use appropriate Toxicity Reference Values and Air Quality Benefits Assessment Tool (risk coefficients for health impact assessment.
Climate Change	■ Include inventory of all greenhouse gas emissions for present and future proposed uses.

1.2 Purpose and Scope of the Study

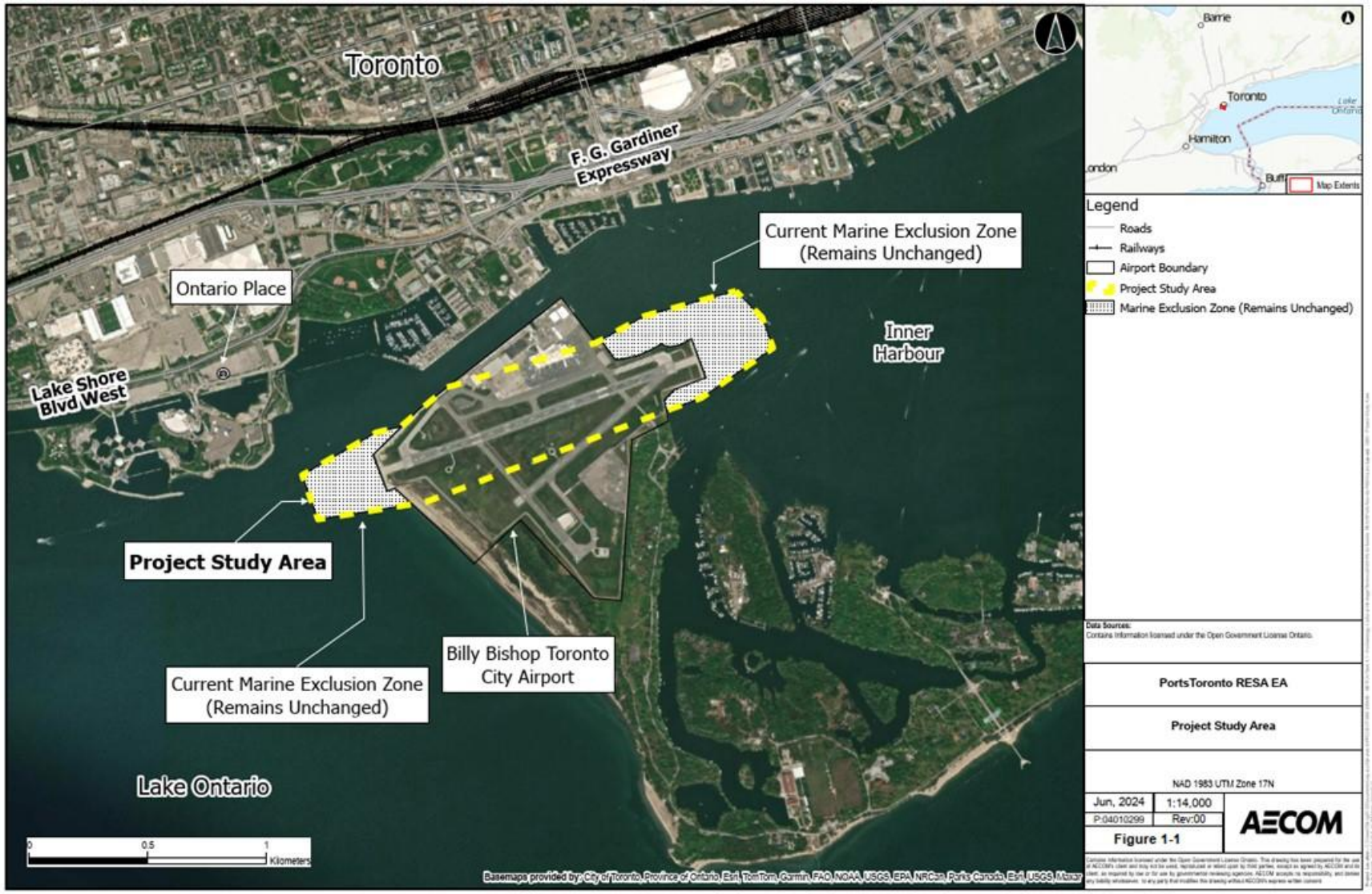
The primary objective of this Gap Analysis is to conduct a thorough review of the available studies to evaluate the adequacy of the available information in capturing the local environmental context and baseline conditions, a pre-requisite for conducting the Environmental Assessment process. This includes a comprehensive review of studies from the AECOM 2017 Environmental Assessment, and any additional relevant studies and technical background provided by PortsToronto and the Avia NG consultant team. The goal was to determine if the existing data are sufficient for establishing current baseline conditions, conducting effects assessments, and facilitating permitting processes. Where gaps were identified, additional studies have been proposed to ensure a complete RESA Environmental Assessment Process.

1.3 Study Area

The Project Study Area encompasses all Billy Bishop Toronto City Airport lands involved in the RESA implementation, including the Marine Exclusion Zone. The Marine Exclusion Zone is a buoy-marked area of the lake where vessel entry is prohibited without PortsToronto' s authorization. The Project Study Area is illustrated in Figure 1-1.

The effects assessment for each Environmental Assessment component will be conducted within a geographic area where the specific effect can be reasonably measured, quantitatively and/or qualitatively.

Figure 1-1: Study Area Map



2. Regulatory Requirements

2.1 Federal Impact Assessment Act

The Project does not meet the requirements under Sections 46 and 47 of the Physical Activities Regulations (SOR/ 2019-285). Initial consultation has occurred between the proponent; PortsToronto, and the Impact Assessment Agency of Canada, as well as Transport Canada. The Impact Assessment Agency of Canada and Transport Canada have advised that the RESA implementation is not an activity listed under the Physical Activities Regulation of the Impact Assessment Act. Therefore, the Project does not automatically require an assessment under the Impact Assessment Act (SC 2019, c28, s.1).

On July 16, 2024, PortsToronto submitted a letter to Impact Assessment Agency of Canada requesting formal confirmation that the Project is not a designated project as defined in the Physical Activities Regulation of the Impact Assessment Act, and there are no requirements at the Federal level for PortsToronto to undergo a Federal Environmental Assessment process. (Refer to **Appendix A** for a copy of the PortsToronto' s letter to Impact Assessment Agency of Canada. PortsToronto will continue to consult with Impact Assessment Agency of Canada about the Project as a Federal Agency with potential interest in the Project. Impact Assessment Agency of Canada's formal response letter will be included in the Environmental Assessment Study Report.

Additionally, since PortsToronto owns the water lots around the airport lands, under PortsToronto's Letters Patent Section 82 (projects on Federal lands) is not triggered for these areas. However, some components of the Project include pavement works on Transport Canada-owned land, meaning a Section 82 evaluation is required for these specific works. According to Transport Canada's guidance, the Section 82 evaluation would be scoped only on the components of the Project that fall on federal land, not to the entirety of the Project. Trasport Canada sent a letter dated July 12, 2024, in response to an initial letter sent by PortsToronto to Transport Canada on June 28, 2024 pertaining to the efforts to ensure compliance with the Canadian Aviation Regulations and regulatory obligations related to the RESA in three years from the date of the letter. In the letter, Transport Canada indicated that it would remain committed to working with both PortsToronto and the City to advance the path forward. Refer to **Appendix A** for a copy of the Transport Canada Letter. Transport Canada is a main stakeholder of the Project and will be consulted throughout the study.

2.2 Ontario Environmental Assessment Act

The Ontario Environmental Assessment Act is a Provincial regulatory framework designed to evaluate potential environmental impacts of certain Provincial projects (e.g., infrastructure developments, industrial facilities, resource extraction, etc.) before they proceed. No requirements under the Ontario Environmental Assessment Act are anticipated for the Project, and there is no mandate to carry out the RESA Environmental Assessment following a particular Provincial process.

PortsToronto has initiated consultation with the Ministry of Environment, Conservation, and Parks to verify that the Project falls outside their jurisdiction under the Ontario Environmental Assessment Act, and to confirm that there are no requirements under the Ontario Environmental Assessment Act for the Project. On July 16, 2024, PortsToronto submitted a letter to the Ministry of the Environment Conservation, and Parks to confirm the understanding that the Project does not trigger the requirements of the Provincial Ontario Environmental Assessment Act. Refer to **Appendix A** for a copy of the PortsToronto' s letter to Ministry of the Environment Conservation, and Parks. Ministry of the Environment Conservation, and Parks's formal response letter will be included in the Environmental Assessment Study Report.

2.3 Municipal Class Environmental Assessment

While the Project does not trigger a Municipal Class Environmental Assessment process (PortsToronto is not a municipal proponent), the City of Toronto's Official Plan, Chapter 3, Policy 17 (December 2023) stipulates that lakefilling projects in Lake Ontario will be supported by the City only where:

a) *"the created land will be used for natural habitats, public recreation or essential public works;*
b) *the project has been the subject of an Environmental Assessment which ensures that water quality and quantity and terrestrial and aquatic habitat will be protected or enhanced, and*
c) *the project does not create new or aggravate existing natural hazards."*

Through the completion of the RESA Environmental Assessment, policy advice from the City of Toronto will be taken into consideration, in consultation with the City. Furthermore, PortsToronto has shared the overall RESA Environmental Assessment work program with the City for their review and feedback. This provides another opportunity to confirm that the RESA process addresses relevant City of Toronto policies.

2.4 Environmental Assessment Framework

Since the Project is not mandated under Federal or Provincial Environmental Assessment legislation, the Environmental Assessment will be conducted as a non-statutory process established through consultation with Federal, Provincial, and Municipal agencies. The RESA Environmental Assessment process will include the following steps:

- Establish baseline conditions;
- Develop evaluation criteria and complete evaluation of alternatives;
- Effects assessment; and,
- Environmental Assessment Study Report.

Avia NG's 2024 study identified a long list of RESA alternatives. Six alternatives were developed as part of the Avia NG's study:

- Alternative 1: Reduction in Usable Runway Length;
- Alternative 2: Reconfigured Thresholds / Pre-Threshold Areas;
- Alternative 3: Engineered Materials Arresting System;
- Alternative 4: RESA 1 – Minimum Landmass;
- Alternative 5: RESA 2 – Taxiway Improvements; and,
- Alternative 6: Refined RESA 3 – Noise Wall and East Utility Conduit.

The first two alternatives, Alternative 1 and 2, have been deemed non-viable as they do not meet the key guiding principle to preserve Runway 08/26 utility and efficiency. With these two alternatives, commercial air service would no longer be viable.

Alternative 3 (Engineered Materials Arresting System) presents certain operational and business risks, including the need for repairs in the event of damage from aircraft or equipment excursions. Failure to address these issues promptly could result in runway closure, which directly affects the preservation of existing runway operations, and the airport's current level of service. Also, Engineered Materials Arresting Systemhas a limited lifespan (up to 20 years), requiring more frequent maintenance, rehabilitation, and possible reconstruction. These ongoing repairs and replacements add both operational costs and disruptions. In response to public feedback from the first open house on July 17, 2024, Engineered Materials Arresting System was reconsidered and reviewed again. However, the above noted constraints represent unacceptable operational and feasibility risks considering that other more practical, longer-lasting, and sustainable alternatives are available. Therefore, Alternative 3 - Engineered Materials Arresting System has been ruled out.

Following the first public meeting and open house, Alternative 6 was also refined into two configurations:

- Refined Alternative 6: RESA 3 – Noise Wall and East Utility Conduit; and,
- Alternative 6B: West Public Road/Pathway, Sound Barrier and Underground Utility Conduit.

These modifications incorporated feedback from the public and key stakeholders regarding the landmass footprint and potential relocation of the access road to the west end. These refinements aimed to optimize the design, reduce impacts, and improve efficiency while maintaining technical viability. Alternative 6B was determined to be non-viable because the west airside access road and utility conduit alignments travel through an electronic protection area associated with existing ground-based instrumentation (glidepath 08) on the west end of the airport, introducing operational and safety risks triggered by restricted use of the landside public utility corridor.

Refer to **Section 3.4** for further details on RESA alternatives.

The Environmental Assessment process will include more information and details on the screening process for all alternatives from the long list, and detailed evaluation of the three RESA alternatives (Alternatives 4, 5 and Refined 6 from the long list).

For ease of review and presentation to the public, the numbering of alternatives has been removed from the titles of alternatives carried forward to the shortlist:

- RESA 1 – Minimum Landmass;
- RESA 2 – Taxiway Improvements; and,
- RESA 3 – Noise Wall and East Utility Conduit.

A ‘Do Nothing Alternative’ will also be considered in the overall evaluation process as it will provide a baseline against the impacts of other proposed alternatives. However, it will be screened out from the evaluation process, because it does not meet Transport Canada’s safety requirements for RESA.

A comprehensive effects assessment of the preferred alternative will be completed that addresses natural environment, cultural, socio-economic, climate change, cost and technical considerations. The Environmental Assessment will be supported by field studies (as required) and the proponent’s engagement of Indigenous communities, the public, interest groups and government agencies.

The study process and findings will be documented in an Environmental Assessment Study Report. The report will include the need for the Project and the steps of the Environmental Assessment process, Project description, existing baseline environmental conditions, evaluation of alternatives, preferred alternative, and results of

effects assessment including proposed mitigations, future permitting, approval requirements and commitments. The Environmental Assessment Study Report will include a comprehensive summary section on PortsToronto' s consultation efforts with the public and stakeholders, as well as its engagement with Indigenous communities.

2.5 Additional Regulatory Requirements

A preliminary list of Federal and Provincial legislation, and other jurisdictional permits and/or approvals applicable or potentially applicable to the Project are summarized in Table 2-1. Permit requirements will be confirmed throughout the Environmental Assessment process and in consultation with regulatory authorities.

Table 2-1: Anticipated Key Permits and Approvals

Permit/Approval/Legislation	Regulator	Description
Federal		
Federal Fisheries Act Authorization	Department of Fisheries and Oceans Canada	The Federal Fisheries Act (1985) is the principal statute which regulates the management of Canadian fisheries resources, including both fish and fish habitat. On August 28, 2019, the new Fish and Fish Habitat Protection Provisions of the Amended Federal Fisheries Act (1985) came into force. The Fish and Fish Habitat Protection Program ensures compliance with relevant provisions under the Federal Fisheries Act and *Species at Risk Act* (2002). If a project proponent is unable to reduce the risk of a harmful alteration, disruption, or destruction to fish habitat or death of fish, those projects may be subject to a Request for Review by Fisheries and Oceans Canada. If death of a fish, or harmful alteration, disruption, or destruction is likely to result from a project, the proponent will be required to obtain Federal Fisheries Act Authorization from Fisheries and Oceans Canada. A Request for Review to the Fisheries and Oceans Canada Fish and Fish Habitat Protection Program will be submitted in advance of commencement of the in-water works and/or near/over water works. The Fisheries and Oceans Canada Fish and Fish Habitat Protection Program review will determine the potential for the Project to cause the death of fish or harmful alteration, disruption, or destruction to fish habitat in contravention of the Federal Fisheries Act requiring a Federal Fisheries Act Authorization.
Navigation Protection Program Approval under Canadian Navigable Waters Act	Transport Canada	Since Lake Ontario is found on the Schedule to the Canadian Navigable Waters Act, approval from Transport Canada under the Navigation Protection Program is required. An application for an approval must be submitted to Transport Canada.
Migratory Birds Protection under Migratory Birds Convention Act and Migratory Bird Regulation 2022	Environment and Climate Change Canada	The regulations under the Migratory Birds Convention Act provide for the conservation of migratory birds and for the protection of their nests and eggs. As of July 30, 2022, the Act provides year-round nest protection to Schedule 1 species under the Migratory Birds Regulation, 2022. Permits under the Act are required if removal of Schedule 1 species' nests needs to occur prior to the end of the designated wait time for that specific species. All other migratory bird species' nests are afforded protection when there is a live bird or a viable egg in it.
Federal Species at Risk protection under Species at Risk Act, 2002	Environment and Climate Change Canada	Species at Risk Act is Federal legislation that monitors Species at Risk in Canada, provides recovery strategies for Extirpated, Endangered or Threatened species, and manages species of Special Concern. Species listed as Extirpated, Endangered or Threatened under Species at Risk Act, and their residences are only protected on Federal lands unless they are also aquatic species or migratory birds listed on schedule 1. Critical habitat designation triggers permitting requirements on non-Federal lands. Species listed in Schedule 1 of the Act can not have their habitat harmed on Federal lands without a Section 73 permit.
Provincial		
Endangered Species Act Permit or Authorization under Endangered Species Act	Ministry of the Environment, Conservation and Parks	Species listed as Endangered or Threatened, and their habitat are generally afforded protection under the Endangered Species Act. Sections 9 and 10 of the Endangered Species Act prohibit the killing, harassment, capture or taking of living individuals of Species at Risk or damaging or destroying their habitat. Where a proposed activity will impact protected species or habitat, changes to timing, location and methods of the proposed activity should be considered, wherever feasible, to avoid impacts to Species at Risk. Where impacts cannot be avoided or mitigated, a permit process can be entered.
Fish and Wildlife Conservation Act	Ministry of Natural Resources	The Fish and Wildlife Conservation Act provides protection and regulation for wildlife in Ontario. This Act protects raptors and other bird species which are not afforded protection under the Migratory Birds Convention Act. Nests of these bird species can only be removed if a permit is obtained from the Ministry of Natural Resources. Similarly, wildlife and fish rescues, requiring the collection and transportation of wildlife, require an authorization from the Ministry of Natural Resources (i.e., Wildlife Scientific Collection Authorization) to avoid contravention of the Fish and Wildlife Conservation Act. Authorization under the Fish and Wildlife Conservation Act may be needed if fish rescue or wildlife salvages are required for any in-water works.
Natural Hazard Policy, 2001	Ministry of Natural Resources	The Ministry of Natural Resources Natural Hazard Policy directs development away from hazardous lands near the Great Lakes and large inland lakes vulnerable to flooding, erosion, and dynamic beach hazards. According to this policy, development is generally prohibited in hazardous areas, especially dynamic beaches. Development may be permitted in hazardous lands if hazards are effectively managed and do not worsen existing conditions.
Provincial Policy Statement, 2024	Ministry of Municipal Affairs and Housing	The Provincial Policy Statement sets the policy framework for regulating development and use of land and is issued under the authority of the Planning Act, 1990. According to Section 2.1, development and site alteration are not permitted in significant wetlands or coastal wetlands. Development and site alteration are also not be permitted in fish habitat, or the habitat of endangered and threatened species, except in accordance with Federal and Provincial requirements. However, development and site alteration may occur adjacent to significant wetlands and significant coastal wetlands, and in or adjacent to significant woodlands, significant valley lands, Significant Wildlife Habitat, and significant Areas of Natural and Scientific Interest provided that it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Permit/Approval/Legislation	Regulator	Description
Archaeological and Cultural Heritage Clearances	Ontario Heritage Act/ Ministry of Citizenship and Multiculturalism	Stage 2 Marine Archaeological Assessment to be completed and submitted to the Ontario Public Register of Archaeological Reports. Built Heritage Resource and Cultural Heritage Landscape screening and Heritage Impact Assessment, where required, submitted to the Ministry of Citizenship and Multiculturalism for review.
Onatiro Regulation 406/19: On-Site and Excess Soil Management	Environmental Protection Act / Ministry of the Environment Conservation, and Parks	Soils within the lakebed are being tested should they be required to be dredged and removed to meet the design requirements. This may trigger the regulation. Onshore materials will be managed onsite and within the airport property.
Ontario Regulation 63/16: Water Taking	Environmental Protection Act / Ministry of the Environment Conservation, and Parks	Any local dewatering must comply with Ministry of the Environment, Conservation, and Parks water taking permits and approvals in accordance with the Ministry of the Environment, Conservation, and Parks Permit to Take Water and meet regulatory requirements for daily volumes.
Regional		
O. Reg. 41/24: Prohibited Activities, Exemptions and Permits	Conservation Authorities Act / Toronto and Region Conservation Authority	The Project is located within the Toronto Waterfront Screening Area and projects within this area are exempt from the Toronto and Region Conservation Authority's Regulatory approval process. As such, a permit under the Conservation Authorities Act is not required. However, in the absence of the formal permitting process, the proponent may voluntarily request Toronto and Region Conservation Authority to review and comment on detailed design activities with Project construction, maintenance or emergency activities within these areas along the shoreline.
Municipal		
City of Toronto Approvals	City of Toronto Official Plan and By-laws	Review the City of Toronto Official Plan including policies on Natural Environment, Natural Hazard, Cultural Heritage, Lakefilling, land use, etc. to determine what may be required. A range of Municipal permits and approvals (e.g., Street Occupation Permit) may be required for the Project, particularly as pertaining to municipally owned lands and infrastructure. PortsToronto shall continue to communicate and engage with the City of Toronto during detailed design and construction planning.

3. Runway End Safety Area (RESA)

3.1 What is a RESA?

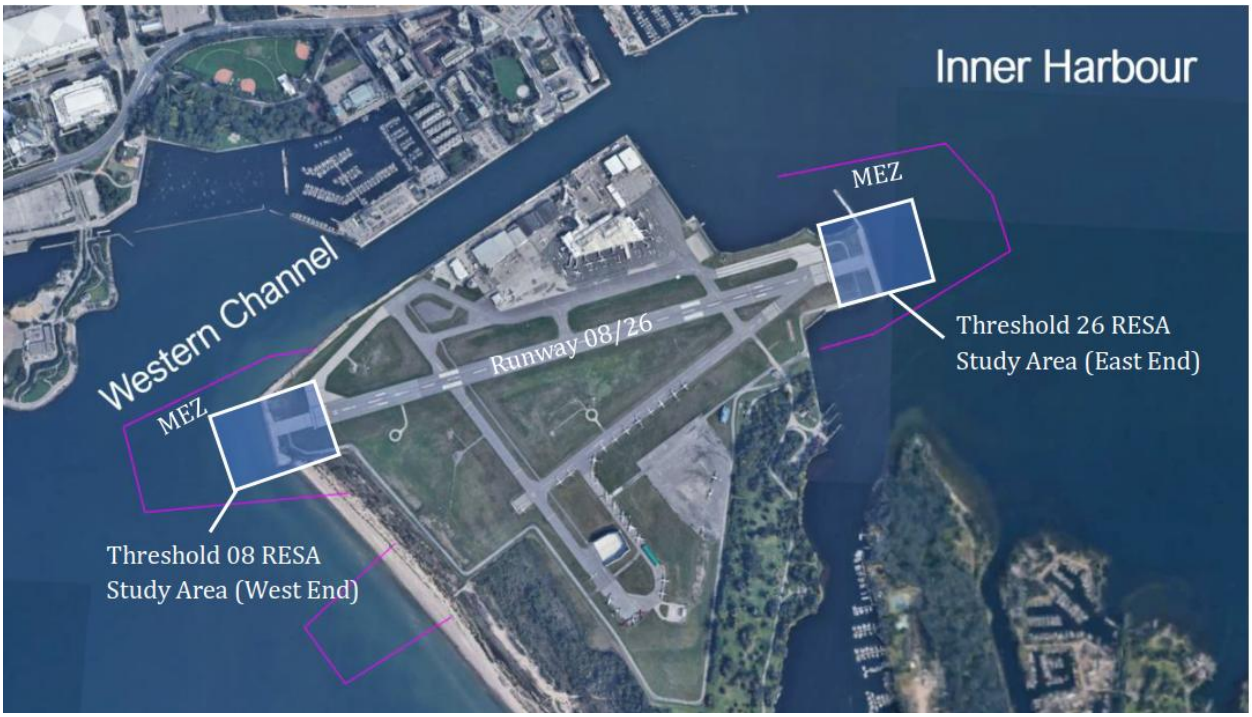
The regulatory definition of RESA, under Subsection 300.01 of the Canadian Aviation Regulations :

> *"RESA or runway end safety area means an area, adjacent to or on a runway that is intended to reduce the severity of damage to an aeroplane in the event that the aeroplane undershoots or overruns the runway."*

As defined by Transport Canada standards, a RESA "…is to have an area free of objects, other than frangible visual and navigational aids required to be there by function, so as to reduce the severity of damage to an aircraft overrunning or undershooting the runway and to facilitate movement of rescue and fire fighting vehicles." (Avia NG, 2024).

RESAs are located at both ends of a runway which is illustrated in Figure 3-1 for the Billy Bishop Toronto City Airport.

Figure 3-1: Runway 08/26 RESAs



Source: Taken from Avia NG Alternatives Study, 2024.

Transport Canada has established design standards for RESAs which are summarized below:

- Has a minimum width twice of the associated runway;
- Is centred on the runway centreline line or extended runway centreline, as applicable;
- Has a minimum length of 150 metres;
- Has no abrupt slope changes or open ditches;
- Has an adequate slope to prevent the accumulation of water;
- Beyond the runway strip, has maximum transverse and longitudinal slopes of 5% downwards;
- Does not protrude into an Obstacle Limitation Surface, defined as “a surface that establishes the limit to which objects may project into the airspace associated with an aerodrome consisting of the following: a takeoff surface, an approach surface, a transitional surface and an outer surface”;
- Under dry conditions, is of sufficient strength to reduce the severity of structural damage to the critical aircraft overrunning/undershooting the runway; and,
- Alternative arresting systems including Engineered Material Arresting Systems may be considered acceptable alternatives to open space design.

3.2 Transport Canada’s Current Requirements

On December 21, 2021, CAR, Subsection 300.01 – RESA came into affect and on January 5, 2022, Transport Canada published these regulations that mandate Canadian certified aerodromes to extend their current RESAs from the existing minimum 60 metres to a minimum length of 150 metres for existing and future runways. This regulation specifically applies to runways serving scheduled passenger air services. Runway 08/26 at Billy Bishop Toronto City Airport falls under this requirement.

Billy Bishop Toronto City Airport handled more than 325,000 passengers in both the 2022 and 2023 calendar years, which is over the threshold for mandatory compliance with the RESA.

In response, PortsToronto initiated a Runway 08/26 RESA Alternatives Study to understand the impacts of RESA compliance for Runway 08/26.

Trasport Canada sent a letter dated July 12, 2024 in response to an initial letter sent by PortsToronto to Transport Canada on June 28, 2024 pertaining to the efforts to ensure compliance with the Canadian Aviation Regulations and regulatory obligations related to the RESA. In the letter, Transport Canada notified PortsToronto that, based on information collected by Transport Canada, in partnership with Statistics Canada under the Electronic Collection of Air Transportation Statistics initiative, Billy Bishop Toronto

City Airport has surpassed the passenger volume threshold during a period of two consecutive calendar years, as set out in subsection 302.600(1) of the Canadian Aviation Regulations. This requires PortsToronto, as the airport owner and operator, to comply with the RESA regulatory requirements within three years of the date of their letter, July 12, 2027. The official deadline for compliance is now set at July 12, 2027.

Refer to **Appendix A** for a copy of the Transport Canada letter.

3.3 RESA at Billy Bishop Toronto City Airport

Billy Bishop Toronto City Airport contains two runways. Runway 08/26 meets the definition of a runway for which RESAs are required since it is "…engaged in a scheduled air service for the purpose of carrying passengers…" as defined in the regulatory amendment. The Airport's other runway, Runway 06/24, does not meet this definition and as such does not require RESAs.

PortsToronto initiated a Runway 08/26 RESA Alternatives Study as part of its efforts to understand the effects of RESA compliance for Runway 08/26. Avia NG conducted the comprehensive analysis of six RESA alternatives for Runway 08/26 at Billy Bishop Toronto City Airport, to ensure compliance with the updated Transport Canada regulations, which now require a RESA of 150 m, an increase from the previous 60 m (Avia NG, 2024). A summary of the RESA alternatives is described in the section below.

3.4 RESA Alternatives

The RESA alternatives that were analyzed as part of the RESA Alternatives Study (Avia NG, 2024) did not consider runway extensions nor were they intended to have any effect on present runway operations, runway capacity, or aircraft types using the runway. The study was intended to guide PortsToronto in the selection of a preferred RESA alternative, which will occur through the RESA Environmental Assessment process.

The long list of RESA alternatives that were evaluated explored several solutions including a non-physical approach to compliance, optimization of existing landmass availability off both runway ends, and new landmass and breakwater expansions to accommodate the physical space required to comply with the RESA requirements. This approach provided a broad range of solutions, with varying levels of complexity, impacts on the environment, community, costs, and construction and implementation schedules.

The long list of RESA alternatives is summarized below[1].

1. The alternative titles have been refined from those in the Avia NG 2024 Alternatives Study to better capture and more clearly convey the characteristics of each alternative. These changes aid in better understanding the distinctions between the alternatives.

3.4.1 Alternative 1: Reduction in Usable Runway Length

This alternative does not involve any physical construction or modifications to existing runway infrastructure. Transport Canada's RESA design standards allow sections of the existing runway and adjacent graded areas at the runway ends to be designated as part of a RESA. This approach, often called a virtual RESA, would adjust the published declared[1] runway lengths, to accommodate the RESA requirements. In order to meet the 150 metres RESA requirement, this alternative proposes reducing Runway 08/26 by 77 metres on the east end and 90 metres on the west end. The additional reduction on the west end accounts for historical winter ice accretion propagation. This alternative would reduce the officially published declared runway length used for regulatory flight planning purposes (Avia NG, 2024).

3.4.2 Alternative 2: Reconfigured Thresholds/Pre-Threshold Areas

This alternative considered physical modifications to incorporate RESA at both runway ends by using the 108 metres of available open space between the existing seawalls and the existing runway ends. This alternative identified the potential to gain 13 metres of additional takeoff length for Runway 26. The objective of this alternative was to mitigate any expansion of landmass into the lake through reconfiguration of pavements or a combination of reconfigured pavements, open space, and the use of the virtual RESA concept from Alternative 1 (Avia NG, 2024).

3.4.3 Alternative 3: Engineered Materials Arresting System

Since there is limited landmass beyond both ends of Runway 08/26, another alternative available to airports under RESA design standards is the use of an Engineered Materials Arresting System . An Engineered Materials Arresting System installation absorbs the kinetic energy of runway excursion aircraft in less space and time than traditional turf or paved safety areas. The material used for Engineered Materials Arresting System essentially crushes under the weight of the excursion aircraft, slowing it down considerably faster than open space. A typical Engineered Materials Arresting System will bring a runway's critical aircraft to a complete stop when it enters the Engineered Materials Arresting System at a speed of 70 knots or less. Transport Canada design standards permit the use of Engineered Materials Arresting System where an airport may lack adequate space for traditional open space safety areas (Avia NG, 2024).

1. The term, "Declared Distance" is an aviation term which describes available runway lengths for the purpose of flight planning and aircraft operational performance calculations.

3.4.4 Alternative 4: RESA 1 - Minimum Landmass

This alternative considers the possibility that Alternatives 1 through 3 would not result in a feasible solution using the existing available landmass and airfield facilities. Alternative 4 explored the design of open space RESAs off both runway ends to provide the regulatory minimum 150m RESA length. Since only 108m of existing landmass and seawall infrastructure exists off both ends of the runway, expansion of landmass into Lake Ontario and the Inner Harbour would be required. Understanding the potential for environmental effects and operational impacts of this work during and after construction, this alternative only considered the minimum expansion required to comply with the regulatory RESA requirements (Avia NG, 2024).

3.4.5 Alternative 5: RESA 2 - Taxiway Improvements

This alternative expands upon Alternative 4: RESA 1 – Minimum Landmass by considering ancillary airfield improvements in conjunction with the RESA work off both runway ends. In this case, improvements to Taxiway B (west end) and Taxiway D (east end) are contemplated based on improving operational efficiency and safety at the airport. Through these additional enhancements, overall airfield efficiency and safety improvements could be established. Taxiway B improvements are enabled by the relocation of the Localizer 26 antenna onto the new western RESA, which increases the landmass expansion to the west (82 metres from seawall). The new Taxiway D relocation requires additional landmass to the north. As a result of the relocation of Taxiway D, the airport can now improve aviation safety by upgrading their visual approach guidance system for landing aircraft on Runway 26 to a higher precision system and improve flood protection along the new taxiway alignment. All other features of this alternative are retained from Alternative 4 (Avia NG, 2024).

3.4.6 Alternative 6: Refined RESA 3 - Noise Wall and East Utility Conduit

This alternative expands upon Alternative 5: RESA 2 – Taxiway Improvements by considering incremental improvements that would further benefit airport operational safety and offer added community benefits. Initially, it proposed three major elements including 1) unrestricted[1] airfield perimeter roads connecting the north and south sides of the airport, 2) a noise wall at the east end, and 3) landmass expansion at the east end to accommodate a future community access road/ pedestrian sidewalk. These new components required a landmass expansion of 66 metres from the seawall (29,980 m^2) on the east end and

1. Unrestricted means the road can be used without requiring co-ordination with the Billy Bishop Toronto City Airport Control Tower.

82 metres from the seawall (12,600 m^2) on the west end to accommodate these new features and to achieve aeronautical airspace clearances over the new roads, security fence and noise walls. All other features of this alternative were retained from RESA 2.

Following public and stakeholder feedback during and after the public meeting on July 17, 2024, Alternative 6 was refined into two configurations to address concerns about landmass footprint, access road location, and potential for additional access to Hanlan's Point Beach:

- Alternatives 6: RESA 3 – Noise wall and East Utility Conduit; and,
- Alternative 6B: West Public Road/Pathway, Sound Barrier and Underground Utility Conduit (described in the following section).

These refinements aimed to optimize the design, reduce impacts, and improve efficiency while maintaining technical viability.

Key adjustments to RESA 3 include a 2,800 m^2 landmass reduction achieved through design optimization, an extension of the noise wall on the west end in addition to the east, relocation of Precision Approach Path Indicator 08 to a standard configuration, and introduction of a reserved utility conduit for future services to the Toronto Islands community. The potential future pedestrian sidewalk option was also removed. All other main features remain consistent with the original design.

3.4.7 Alternative 6B: RESA 3B - West Public Road/Pathway, Sound Barrier and Underground Utility Conduit

As noted in the previous section, RESA 3B is a refined configuration of RESA 3, developed in response to public and stakeholders' feedback. The feedback suggested that an access road and utility connection on the west end of the airport could be more effective than those on the east and would likely require less landmass.

Similar to Alternative RESA 3, Alternative 3B proposes improvements to enhance airport safety and provide community benefits. This updated version of RESA 3 incorporates a comprehensive design for a west end perimeter road, providing unrestricted access between the north and south sides of the airport. This eliminates the need for runway crossings that currently support both airport operations and Toronto Islands residents.

For utility access, the design includes a reserve corridor within the landside road right-of-way on both the east and west ends, improving infrastructure serviceability. The proposed refinement shifts landmass requirements, reducing the expansion on the east end (63 metres / 20,380 m^2), and increasing it on the west end (96 metres / 16,330 m^2). Other features of RESA 3B are similar to RESA 3.

3.4.8 Summary of Alternatives

In summary, Alternatives 1 and 2 would involve adjusting the runway length or modifying surrounding open spaces to create a virtual RESA. Alternative 3 explored the use of an Engineered Materials Arresting System as a RESA solution suitable for airports with limited space which included landmass expansion on the west side of the airport. Alternatives 4 (RESA 1), 5 (RESA 2), 6 and 6B (RESA 3 and 3B) focused on adding landmass at each end of Runway 08/26, thereby maintaining its original length while meeting RESA requirements and enhancing safety and environmental considerations.

As noted in **Section 2.4**, Alternatives 1 and 2 have been deemed non-viable as they do not meet the key guiding principle to preserve Runway 08/26 utility and efficiency, and they both significantly impact viability of commercial air service. Alternative 3 (Engineered Materials Arresting System) presents certain operational and business risks, including the potential need for repairs in the event of damage from aircraft or equipment excursions. Failure to address these issues promptly could result in runway closure. In response to public feedback from the first open house, Engineered Materials Arresting System was reconsidered and reviewed again. However, due to unacceptable operational, feasibility and regulatory risks, it has been ruled out. A new configuration of Alternative 6: RESA 3 (3B) was also developed, but later ruled out due to operational and safety conflicts with the existing electronic protection area associated with existing ground-based instrumentation on the west end of the airport. The Environmental Assessment Study Report provides a comprehensive and detailed analysis of the screening process for the long list of proposed alternatives.

Following screening of the long list of alternatives, the Environmental Assessment process will focus on a detailed evaluation of the three short-listed RESA alternatives (Alternatives 4, 5, and Refined 6) from the long list. For ease of review and presentation to the public, the numbering of alternatives has been removed from the titles of alternatives carried forward to the shortlist:

- **RESA 1: Landmass Expansion;**
- **RESA 2: Taxiway Improvements; and,**
- **RESA 3: Noise Wall and East Utility Conduit.**

A preferred alternative will be selected as part of the RESA Environmental Assessment process.

Figure 3-2 provides an outline of the RESA Alternatives that are subject to evaluation.

Figure 3-2: Summary of RESA Alternatives Subject to Evaluation

RESA Alternative Layout	Alternative Title Description and Estimated Schedule	Supplemental Operational & Safety and Environment, Social and Governance Enhancements	Landmass / Breakwater Expansion (Approximate and for Comparison Purposes)	Capital Costs (2024 CDN$)
	**RESA 1** – Minimum Landmass ***Meets Compliance Timeline (Mid 2027)*** Critical Path Activities are Permitting 12 to 18 months.	■ None.	West End ■ 7,850 m^2 / 54 metres from Seawall; and, ■ 160,000-170,000 tonnes. East End ■ 6,100 m^2 / 52 metres from Seawall; and, ■ 157,000 to 162,000 tonnes.	**$61M** **Note:** Includes modifications to NAV Canada Marine Radar System.
	**RESA 2** – Taxiway Improvements ***Meets Compliance Timeline (Mid 2027)*** Critical Path Activities are Permitting 12 to 18 months. Construction phased over 2 years.	■ Operational Localizer 26 Relocated; ■ Operational and Safety: Taxiway B & D; ■ Flood proofing improvements enabled for Taxiway D; and, ■ Safety: Precision Approach Path Indicator 26 (Replace Abbreviated Precision Approach Path Indicator).	West End ■ 11,800 m^2 / 82 metres from Seawall; and, ■ 250,000 to 255,000 tonnes. East End ■ 11,300 m^2 / 52 metres from Seawall; and, ■ 190,000 to 195,000 tonnes.	**$95M** **Note:** Includes modifications to NAV Canada Marine Radar System and Localizer 26 Relocation.
	**RESA 3** – Noise Wall and East Utility Conduit ***Meets Compliance Timeline (Mid 2027)*** Critical Path Activities are Permitting 12 to 18 months. Construction phased over 2 years.	■ Operational Localizer 26 Relocated; ■ Operational and Safety: Taxiway B & D; ■ Flood proofing improvements enabled for Taxiway D; ■ Safety: Precision Approach Path Indicator 26 (Replace Abbreviated Precision Approach Path Indicator); ■ Safety: Airside Roads Unrestricted; ■ Environment, Social and Governance: Airside and Landside utility conduit (east end) being used by servicing vehicles accessing Toronto Island; and, ■ Environment, Social and Governance: Noise walls along the northwest limits of the site, and the northeast airside with the final limits subject to findings of noise study and final design.	West End ■ 12,600 m^2 / 82 metres from Seawall; and, ■ 275,000 to 280,000 tonnes. East End ■ 29,980 m^2 / 73 metres from Seawall; and, ■ 580,000 to 585,000 tonnes.	**$172M** **Note:** Includes modifications to NAV Canada Marine Radar System and Localizer 26 Relocation.

Note: For ease of review and presentation to the public, the title of alternatives has been refined to more clearly convey the characteristics of each alternative.
Source: Adapted from Avia NG Alternative Study, 2024.

4. Environmental Assessment Components Gap Analysis

The Environmental Assessment will assess the effects of the Project to the following environmental components:

- Natural Environment;
- Marine Physical Environment;
- Water Quality;
- Socio-Economic Environment;
- Marine Navigation;
- Air Quality;
- Noise;
- Built Form and Land Use;
- Transportation; and,
- Archaeology and Cultural Heritage.

The following sections provide the results of the Environmental Assessment Gap Analysis. A Public Health Effects Assessment was completed as part of AECOM 2017 Environmental Assessment, comparing noise and air quality levels associated with the Future Airport Scenarios (200m extension on each end of the runway and operation of commercial jets) to thresholds and /or guidelines where health effects were observed. Considering that implementation of the RESA will not change the operation of the airport (type and frequency of the flights will remain the same in the future scenario of the Project), it is assumed that there will be no anticipated health impacts. As such, a gap analysis was not completed for this component at this time.

4.1 Natural Environment

4.1.1 Terrestrial

4.1.1.1 Overview of Completed Studies

To inform the Gap Analysis, a variety of previous studies completed within and adjacent to the RESA footprints were reviewed and evaluated to determine the extent to which historic information related to the terrestrial existing conditions within the Project Study

Area could be carried forward. The following documents were found to contain relevant historic information related to the terrestrial conditions within the Project Study Area:

- **Toronto Port Authority Proposed Pedestrian/Services Tunnel and Perimeter Road Project Environmental Screening Report, Dillon Consulting Limited, 2011;**
- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017. (Appendix C-10: Natural Environment Cumulative Net Effects Assessment, 2015); and,**
- **Natural Environment Review for Runway End Safety Area Treatments at Billy Bishop Toronto City Airport, Morrison Hershfield, 2024.**

Table 4-1 below provides a summary of the studies completed within the Project Study Area for each of the reviewed secondary sources.

Table 4-1: Overview of Completed Studies Documenting the Terrestrial Environment

Secondary Source	Study Area	Background Records Review	Agency Consultation	Vegetation Surveys	Avian Surveys	Significant Wildlife Habitat Screening	Species at Risk Habitat Screening
Toronto Port Authority Proposed Pedestrian/ Services Tunnel and Perimeter Road Project Environmental Screening Report (Dillon Consulting Limited, 2011)	Study Area consisted of two parts; one focusing on the proposed pedestrian tunnel and the other concerning the airport perimeter road.	It is unclear if a background information review has been completed.	Consultation with agencies to obtain natural heritage data are assumed to have occurred in support of this report.	Ecological Land Classification system for Southern Ontario (Lee et. al., 1998) was completed in 2010 to map vegetation communities and collect a one season plant list. A tree and shrub survey was done documenting trees with a diameter at breast height of 15 centimetres or greater within 5m of airport south fence.	No avian surveys were completed; however, wildlife including birds were incidentally recorded during the vegetation surveys.	Significant wildlife habitat screening was not completed.	Species at Risk identified during field investigations were documented in the report.
Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report (AECOM, 2017)- Appendix C-10: Natural Environment Cumulative Net Effects Assessment (AECOM, 2015)	The Study Area included the primary and secondary bird hazard zones associated with the Billy Bishop Toronto City Airport (approximately 4 kilometres east and west of the airport). Field investigations were conducted approximately within 120 and 500m of each runway end.	Information pertaining to wildlife records and natural heritage features was obtained between 2013 and 2015 from various sources including wildlife atlases, previous technical studies, interactive mapping, agencies, and external stakeholders.	Consultation occurred between 2014 and 2015 with several agencies to obtain natural heritage data including Ministry of Natural Resources, Toronto and Region Conservation Authority, Canadian Wildlife Services, Bird Studies Canada, Transport Canada, City of Toronto and various local naturalist clubs.	Ecological Land Classification system for Southern Ontario (Lee et. al., 1998) was completed in 2014 to map vegetation communities and collect a one season plant list with a special focus on identification of rare plants.	Seasonal avian surveys between fall 2014 and summer 2015 were completed by avian biologists between 500m of each runway end. Avian surveys included: fall and spring migration surveys, overwintering surveys, breeding bird surveys and summer cormorant behaviour surveys.	Significant wildlife habitat screening was completed using the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E document (MNR, 2015).	Species records were obtained from background records review and presence or absence of each species was confirmed through either the vegetation or avian surveys.
Natural Environment Review for Runway End Safety Area Treatments at Billy Bishop Toronto City Airport (Morrison Hershfield, 2024)	The Study Area consisted of a 120m buffer around each of the runway ends.	Background information review was largely based on AECOM's Natural Environment Cumulative Effects Assessment Memorandum (2015) in support of the 2017 Environmental Study Report but supplemented with more recent data (2023 to 2024) obtained from online secondary sources.	Agency consultation was not undertaken.	Field investigations were not undertaken.	Field investigations were not undertaken.	Morrison Hershfield re-confirmed AECOM's Significant Wildlife Habitat screening.	Species at Risk habitat screening was completed based on background desktop review.

4.1.1.2 Summary of Findings from Technical Studies

A high-level summary of results from the Toronto Port Authority Proposed Pedestrian/Services Tunnel and Perimeter Road Project Environmental Screening Report (Dillon Consulting Limited, 2011) is provided below as it pertains to the Project Study Area therein:

- Within the entire Toronto waterfront and island system, 300 species of birds had been reported, generally as migratory birds. Approximately 90 of the species are found to be nesting within the Toronto waterfront area based on background review;
- Within the area of the pedestrian tunnel, there were no Species at Risk that would be affected by that portion of the project. Within 5m of the south perimeter fence, a Kentucky Coffee Tree(*Gymnocladus dioicus*), a Species at Risk has been identified outside of the area of project activities;
- The vegetation around the pedestrian tunnel consists of weeds that have grown in cracks in the pavement. The perimeter road portion was identified as containing the following ecological communities: Parkland, Treed Sand Barren Ecosite, Dry-fresh Mixed Meadow and Mineral Shrub Shoreline;
- During site visits completed in 2010, twenty bird species and three butterfly species were encountered. Two Species at Risk were identified, Caspian Tern (*Hydroprogne caspia*) and Monarch butterfly (*Danaus plexippus*); and,
- No wetlands were identified within the Pedestrian Services and Perimeter Road study area.

A high-level summary of results from the Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report (AECOM, 2017) is provided below as it pertains to the Project Study Area therein:

- There are two Provincially Significant Wetlands, one Locally Significant Wetland, five Life Science Areas of Natural and Scientific Interest, one Earth Science Area of Natural and Scientific Interest, 16 Environmentally Significant Areas, and two globally recognized Important Bird Areas (Tommy Thompson Park/Leslie Street Spit and West End of Lake Ontario);
- Portions of the Project Study Area fall within the City of Toronto Natural Heritage System, Ravine and Natural Feature Protection By-law, and Toronto and Region Conservation Authority Regulated Areas;

- Billy Bishop Toronto City Airport primarily consisted of well-maintained lawns, runways, taxiways, and buildings. There were areas of vegetation on the shoreline at the end of the runways, however, the western shoreline (Hanlan's Point Beach) partially falls within the Billy Bishop Toronto City Airport. This area was represented by two vegetation communities including mineral open beach/bar and little bluestem – switchgrass – beachgrass open dune;
- The minimal natural vegetation cover at Billy Bishop Toronto City Airport does not support high-functioning wildlife habitats including migratory birds. No significant wildlife habitat was identified directly on the grounds. Habitat was, however, observed within 120m of the runway extension areas including potential waterfowl stopover and staging area in the surrounding water, migratory butterfly stopover area at Hanlan's Point Beach and on Toronto Island;
- AECOM recorded a total of 38 bird species in surveys conducted within or near the Billy Bishop Toronto City Airport. The majority of these species were waterfowl and shorebirds that utilized the open water and shorelines. Nests of migratory bird species were observed on the abandoned wooden terminal building on the southeast side of the airport. However, overall bird habitat within Billy Bishop Toronto City Airport is limited. Natural areas suitable for breeding are scarce;
- No significant wildlife habitat was identified directly on the grounds. Habitat was, however, observed within 120m of the runway extension areas including potential waterfowl stopover and staging area in the surrounding water, migratory butterfly stopover area at Hanlan's Point Beach and on Toronto Island, and little bluestem – switchgrass – beachgrass open dune vegetation community; and,
- Species at Risk and Species of Conservation Concern identified in or around the Billy Bishop Toronto City Airport included Barn Swallow (*Hirundo rustica*), Bank Swallow (*Riparia riparia*), Chimney Swift (*Chaetura pelagica*), Caspian Tern, Long-tailed Duck (*Clangula hyemalis*), Redhead (*Aythya americana*), Great Egret (*Ardea alba*), Peregrine Falcon (*Falco peregrinus*) and Semipalmated Sandpiper (*Calidris pusilla*).

A high-level summary of results from the Natural Environment Review for RESA Treatments at Billy Bishop Toronto City Airport (Morrison Hershfield, 2024) is provided below as it pertains to the Project Study Area therein:

- The Morrison Hershfield report summarized many of the findings from the AECOM 2017 Environmental Assessment report;

- There are several designated natural areas present within or adjacent to the Morrison Hershfield 2024 project area: Toronto and Region Conservation Authority Regulated Lands, Toronto Islands Candidate Life Sciences Area of Natural and Scientific Interest, Hanlan's Point Beach Environmentally Significant Area, Toronto Islands Coastal Wetlands Complete Provincially Significant Wetland and the City of Toronto Natural Heritage System;
- The airport property consists of well-maintained lawns, runways, taxiways and buildings, small areas of vegetation are located on the shoreline at the end of the runways but are too small to be considered vegetation communities from an Ecological Land Classification;
- Hanlan's Point Beach is represented by two vegetation communities: Mineral Open Beach/Bar and Little Bluestem – Switchgrass – Beachgrass open Dune (SDO1-1). The SDO1-1 community has a subnational conservation rank of S2 (imperiled), meaning the community is rare within Ontario and is at high risk for extirpation if habitat is lost;
- Significant wildlife habitat has been identified in the Billy Bishop Toronto City Airport, including Waterfowl Stopover and Staging Area, Migratory Butterfly Stopover area, Rare Vegetation Community SDO1-1 and habitat for Species of Concern at Hanlan's Point Beach; and,
- The following Species at Risk have potential to occur at the airport: Bank Swallow, Barn Swallow, Chimney Swift, Peregrine Falcon, Piping Plover (*Charadrius melodus*), Northern Map Turtle (*Graptemys geographica*), and Monarch butterfly. Of note, Barn Swallow has been de-listed from Threatened to Special Concern in 2023 and no longer receives the individual and habitat protections under the Endangered Species Act, 2007.

4.1.1.3 Compliance and Governance Requirements

Section 2.5 describes the Federal and Provincial legislation, and other jurisdictional permits and/or approvals applicable or potentially applicable to the Project; the following of those are relevant to the terrestrial environment and should be considered for the proposed development of the RESA:

- **Species at Risk Act** :
  This act applies to any species listed as Threatened, Endangered or Extirpated on Schedule 1 of Species at Risk Act on Federal lands, aquatic species or those birds that are also protected under the Migratory Birds Convention Act.

- **Migratory Birds Convention Act and Migratory Bird Regulations 2022**: The Toronto Islands are an important migratory bird stopover location, as well as waterfowl stopover and staging area.
- **Provincial Policy Statement :** Development impacts must be assessed on coastal wetlands, significant woodlands, fish habitat and significant wildlife habitats, if any.
- **Fish and Wildlife Conservation Act :** Specially protected species may inhabit within the Project Study Area.
- **City of Toronto Official Plan**: The proposed RESA are located within the City's Natural Heritage System, which includes but is not limited to watercourses and hydrological features, beaches, significant aquatic features and their functions, vegetation communities and species of concern. An Environmental Impact Study (EIS) is typically required for any development or site alteration proposed within or adjacent to the Natural Heritage System to evaluate potential impacts to natural heritage features and identify mitigation measures. The requirements of an EIS, if any, will be confirmed with the City of Toronto.
- **Ontario Regulation 41/42**: The Project is located within the Toronto Waterfront Screening Area and projects within this area are exempt from the Toronto and Region Conservation Authority's Regulatory approval process.

The need for permits under each of these acts or policies identified above will be further confirmed and identified as part of the RESA Environmental Assessment process.

4.1.1.4 Gap Identification

Gap 1: Updated existing conditions (i.e., field data and background information):

- Updated Field Studies: The most recent field studies were completed between 2014 and 2015 (AECOM, 2017). Morrison Hershfield (2024) recommended that further field studies be completed to update the existing conditions information. Generally, field data that is older than 5 years old is outdated and needs to be re-confirmed or updated because of natural ecological succession or changes in the landscape over time.

Gap 2: Update Species at Risk Habitat Screening due to changes in regulatory / legislative updates:

- Several changes in the protection status of species under the Endangered Species Act have occurred as recent as January 2024, with upcoming changes in January 2025 and also changes under the Species at Risk Act, 2002.

4.1.1.5 Recommendations

The following are the recommendations that are necessary based on the data gaps identified to properly assess potential effects on the terrestrial environment as part of the Environmental Assessment Update:

- Complete an updated background information review within 120m of the proposed RESA footprint using online secondary sources;
- Complete a one-day site-reconnaissance visit to confirm or revise vegetation community classification and boundaries;
- Complete a search for any rare plants in or in the immediate vicinity of the construction footprint;
- Update the Significant Wildlife Habitat and Species at Risk Habitat Screening; and,
- Avian surveys are not recommended as the impacts are anticipated to be limited to mostly the shoreline with no changes to flight operation and sufficient data pertaining to bird records are available from secondary sources.

4.1.2 Fisheries

4.1.2.1 Overview of Completed Studies

To inform the Gap Analysis, a variety of previous studies completed within and adjacent to the RESA footprint were reviewed and evaluated to determine the extent to which historic information related to the aquatic existing conditions within the Project Study Area could be carried forward. The following documents were found to contain relevant background information related to the aquatic conditions within the Project Study Area:

- **Natural Environment Review for Runway End Safety Area Treatments at Billy Bishop Toronto City Airport, Morrison Hershfield, 2024:**
  High-level desktop screening of existing environmental background studies to identify environmental conditions or constraints that could influence the conceptual design process for the Project.

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017 (Appendix C-10: Natural Environment Cumulative Net Effects Assessment, AECOM, 2015):**
  Environmental assessment document to evaluate potential environmental effects on the aquatic and terrestrial environment associated with a proposed runway extension at Billy Bishop Toronto City Airport . Aquatic and terrestrial existing conditions assessed during field studies are summarized and cumulative net effects are quantified in support of a broader environmental assessment documented in an Environmental Study Report for the project.
- **Billy Bishop Toronto City Airport – 2018 Airport Master Plan, Billy Bishop Toronto City Airport 2018:**
  Planning and policy document describing the mission, guiding principles, and governance of the Billy Bishop Toronto City Airport under the leadership of PortsToronto. The document also outlines growth and infrastructure objectives, environmental stewardship initiatives, and development recommendations.
- **Lakefill within Marine Exclusion Zone Environmental Assessment Report, Dillon, 2013:**
  Environmental Assessment report to support proposed lake infilling within the Marine Exclusion Zone off the east end of the Billy Bishop Toronto City Airport main runway, for the purposes of improving safe use and operation of the airport and utilizing excess materials generated by nearby construction of a pedestrian tunnel.
- **Toronto Port Authority Proposed Pedestrian/Services Tunnel and Perimeter Road Project Environmental Screening Report, Dillon 2011:**
  Environmental screening report to support proposed construction of a pedestrian and services tunnel under the Western Channel (or Gap) which would link the mainland to the Billy Bishop Toronto City Airport for the purposes of improving pedestrian and security access to the airport and to facilitate improved access for services such as fibre optic cables. A perimeter access road is also proposed to be constructed inside the existing security fence.
- **Noise Barriers and Engine Ground Run-Up Enclosure Environmental Screening Report, Dillon 2011:**
  Environmental screening report to support proposed construction of two noise barriers and a groundside engine run-up enclosure at the Billy Bishop Toronto City Airport for the purposes of reducing noise levels to the surrounding community from groundside airport operations.

4.1.2.2 Summary of Findings from Technical Studies

Of the background documents reviewed, six previous studies were found to contain relevant aquatic habitat information. The key findings from each of the reviewed studies are summarized below.

- **Natural Environment Review for Runway End Safety Area Treatments at Billy Bishop Toronto City Airport , Morrison Hershfield, 2024:**

  Field investigations were not completed as part of this report. This document largely summarizes field surveys completed by AECOM in 2015.

  Fish habitat within Lake Ontario in the vicinity of the Morrison Hershfield 2024 study area is generally characterized by the effects of anthropogenic alteration but is nonetheless classified as having a coldwater thermal regime and supports resident and migratory fish species.

  - Based on background information, the report lists 63 species of fish as having the potential to occur within the Morrison Hershfield 2024 study area; however, records for 24 species (38%) are only identified by one background information source and are not specifically identified within the Morrison Hershfield 2024 study area;
  - Based on previous field studies (AECOM 2015), substrate off the east and west ends of the runway were dominated by sand with silt subdominant;
  - Aquatic macrophytes, including Coontail (*Ceratophyllum demersum*), Canada Waterweed (*Elodea canadensis*), and Eurasian Milfoil (*Myriophyllum spicatum*) were found to be abundant off the east end of the runway; however, aquatic macrophytes were generally absent off the west end of the runway. Differences in aquatic macrophyte distribution and abundance attributed to shallower water and wind and wave protection offered by the Inner Harbour as compared to the relatively open water off the west end of the runway; and,
  - Fish habitat off the east end of the runway was determined to be of “moderate” quality due to presence of cover, while habitat off the west end of the runway was determined to be of “low to moderate” quality due to a lack of cover.

Online mapping identified two aquatic Species at Risk as potentially occurring within the proposed Morrison Hershfield 2024 study area: American Eel (*Anguilla rostrata*) and Shortnose Cisco (*Coregonus reighardi*).

- Shortnose Cisco prefers deeper water (i.e., 22 to 92m) and as such, was deemed not likely to occur within the Morrison Hershfield 2024 study area given the relatively shallow water (i.e., less than 12m) associated with both ends of the runway.

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017. (Appendix C-10: Natural Environment Cumulative Net Effects Assessment, 2015):**

  Reconnaissance-level field investigations utilizing divers were completed to characterize substrate and aquatic vegetation composition within the proposed footprint on both ends of the runway. Characterization of fish community was completed through review of background information and agency consultation. Fish records for the AECOM 2017 Environmental Assessment study area included 30 species and indicated a generalist community populated by species which can adapt to and utilize a wide range of habitats and are considered to be moderately sensitive to anthropogenic impacts.

  Fish habitat off the east end of the runway was characterized predominately by sand substrate, with lesser amounts of silt observed at a small number of sample locations.

  A variety of aquatic vegetation was observed throughout most of the assessed area and included Eurasian water milfoil, Canada waterweed, coontail, and fanwort (*Cabomba caroliniana*). Approximately 30% of the surveyed area did not have aquatic vegetation coverage. Habitat was assessed as “moderate” quality based on the abundance of cover provided by aquatic vegetation and the presence of sand substrate.

  Fish habitat off the west end of the runway was characterized predominately by sand substrate, with organic debris at some sample locations and zebra mussel (*Dreissena polymorpha*) shells noted at one location.

  Aquatic vegetation was limited and patchy throughout the assessed area. Fish habitat was assessed as generally “low to moderate” quality based on the absence of aquatic vegetation; however, the report notes that sand substrate in this area could provide higher value habitat to certain species.

No aquatic Species at Risk were observed during field investigations; however, records of American Eel within Toronto Harbour, in the vicinity of the AECOM 2017 Environmental Assessment study area, were noted in the report based on agency correspondence. Given the general lack of suitable cover and refuge habitat for American Eel within the AECOM 2017 Environmental Assessment study area, the report determined that negative net effects for this species were not anticipated. Based on the presence of sand substrate within the AECOM 2017 Environmental Assessment study area, the report identifies the suitability of the habitat for species such as the Eastern Sand Darter (*Ammocrypta pellucida*); however, this species is not identified in the report as previously occurring in the area.

- **Billy Bishop Toronto City Airport – 2018 Airport Master Plan, Billy Bishop Toronto City Airport 2018:**

  In collaboration with the Toronto and Region Conservation Authority, PortsToronto created two new wetlands at Tommy Thompson Park completed between 2007 and 2016. The creation of these wetlands has increased available fish and wildlife habitat and promoted an increase in bird and fish populations, with Northern Pike (*Esox lucius*) and Walleye (*Sander vitreus*) reported returning to the area.

  PortsToronto is a member of Aquatic Habitat Toronto, a consensus-based partnership between government agencies with a vested interest in conserving aquatic habitat along the Toronto Waterfront. Through this partnership, underwater telemetry equipment has been implemented within the Marine Exclusion Zone surrounding the Billy Bishop Toronto City Airport City Airport to track fish movements. However, no data pertaining to fish telemetry were provided in the 2018 Airport Master Plan.

- **Lakefill Within Marine Exclusion Zone Environmental Assessment Report, Dillon, 2013:**

  Limited or no data are available on existing conditions within the Dillon 2013 project footprint due to public access restrictions associated with the Marine Exclusion Zone.

  The fish community was assumed based on records for nearby areas of Lake Ontario and the Western Channel given the transient nature of most fish species.

  The Toronto and Region Conservation Authority confirmed low fish abundance in the Western Channel based on previous electrofishing surveys

(2005 – 2009). Most common species surveyed in Spadina Quay included Alewife (*Alosa pseudoharengus*), Northern Pike, Emerald Shiner (*Notropis atherinoides*), Spottail Shiner (*Notropis hudsonius*), Pumpkinseed (*Lepomis gibbosus*), and Common Carp (*Cyprinus carpio*).

Fish habitat was estimated based on shoreline observations and confirmed through communications with Aquatic Habitat Toronto in 2012 and is assumed to be primarily silt substrate with lesser amounts of sand and limestone rip-rap along the shoreline. Availability of other habitat features (e.g., aquatic vegetation, woody debris) was assumed to be limited with specific composition of lakebed in the proposed footprint not-well known. Filamentous algae (*Cladophora sp*.) was observed during field studies. Water depths within the proposed footprint ranged from 1.5m to 7.5m.

The Dillon 2013 project area was identified as a potential movement corridor between Toronto Harbour and adjacent, sheltered embayments, along the shoreline to the south and/or east, where more favourable habitat conditions exist.

Online mapping identified three aquatic Species at Risk as potentially occurring within the Dillon 2013 project area: American Eel, Silver Lamprey (*Ichthyomyzon unicuspis*), and Eastern Pondmussel (*Ligumia nasuta*). Each species has previously been observed along the shoreline of the Toronto Islands and the Billy Bishop Toronto City Airport, but not specifically within the Dillon 2013 project location. This report concludes that habitat within Dillon 2013 project footprint is non-limiting for each of the three Species at Risk species identified, and no critical habitat for these species is known to exist within the proposed lakefill area.

- **Toronto Port Authority Proposed Pedestrian/Services Tunnel and Perimeter Road Project Environmental Screening Report, Dillon, 2011:**

  Review of background data indicated the fish community for the general area included White Sucker (*Catostomus commersoni*), Common Carp, Northern Pike, Yellow Perch (*Perca flavescens*), Rock Bass (*Ambloplites rupestris*), Largemouth Bass (*Micropterus salmoides*), Gizzard Shad (*Dorosoma cepedianum*), Pumpkinseed, Brown Bullhead (*Ameiurus nebulosus*) and Alewife.

  Toronto and Region Conservation Authority confirmed low fish abundance in the Western Channel based on previous electrofishing surveys (2005 – 2009). Most common species surveyed in Spadina Quay included Alewife,

Northern Pike, Emerald Shiner, Spottail Shiner, Pumpkinseed, and Common Carp.

Other studies completed between 2007 – 2009 along the eastern edge of the Western Channel found that the fish community was dominated by Round Goby (*Neogobius melanostomus*) and Alewife, while the western edge, near the Ontario Place shoreline, was dominated by White Sucker.

Fish habitat within the Western Channel was relatively homogenous with channel sides composed of steel sheet piles and substrate consisting of hard-packed sand and limestone bedrock through the channel trough. Earlier substrate studies within the channel indicated 65% sand over bedrock and 35% bare bedrock. Channel depths were found to range from 10.5m to 12.0m through much of the channel.

No aquatic plants were observed during field work (1996) which is consistent with other studies at this location.

Habitat conditions within the channel and adjacent harbour areas were impacted by maintenance dredging.

The Western Channel serves as a migratory corridor for fish moving from the harbour and lagoons around the Toronto Islands to more favourable habitat along the Ontario Place shoreline (i.e., west) where increased spawning, rearing, and forage habitat exists.

Online mapping identified two aquatic Species at Risk as potentially occurring within the Dillon 2011 Pedestrian/Services Tunnel and Perimeter Road project area: American Eel and Atlantic Salmon (*Salmo salar*); however, at the time of writing, Atlantic Salmon was considered Extirpated.

- **Noise Barriers and Engine Ground Run-Up Enclosure Environmental Screening Report, Dillon, 2011:**

  This report was prepared by the same consultant during the same year as the Toronto Port Authority Proposed Pedestrian/Services Tunnel and Perimeter Road Project Environmental Screening Report (Dillon 2011). As such, fish and fish habitat existing conditions information presented in this report is consistent across both documents.

4.1.2.3 Compliance and Governance Requirements

Section 2.5 describes the Federal and Provincial legislation, and other jurisdictional permits and/or approvals applicable or potentially applicable to the Project; the following

of those are relevant to the aquatic environment and should be considered for the proposed development of the RESA:

- **Species at Risk Act:**
  In the aquatic context, this act applies to any species listed as Threatened, Endangered or Extirpated on Scheduled 1 of Species at Risk Act. According to background studies completed for the Project Study Area in 2017 and 2024, Shortnose Cisco, listed Federally as Endangered under Species at Risk Act has been identified as potentially occurring within the Project Study Area.
- **Federal Fisheries Act:**
  Based on the proposed lake infilling required to construct the Design Alternatives RESA 1, RESA 2, and RESA 3, it is understood that the Project will likely require an Authorization under this Act.
- **Endangered Species Act:**
  According to background studies completed for the Project Study Area in 2017 and 2024, American Eel, listed provincially as Endangered under the Endangered Species Act has been identified within the Project Study Area. Based on the area likely to be impacted by the Project, it is assumed that impacts to American Eel and its habitat can be avoided, and as such, an Overall Benefit Permit under the Endangered Species Act will not be required; however, this will need to be confirmed during consultation with the Ministry of the Environment Conservation, and Parks.

4.1.2.4 Gap Identification

Gap 1: Missing recent / updated existing conditions information. Information reviewed and evaluated during this Gap Analysis is at least nine years old (often older) and is largely based on review of background information sources, results of agency consultation, or personal communications. The only confirmed physical data describing the condition of the lakebed within the Project Study Area was collected by AECOM in 2015 and should be considered stale-dated.

Gap 2: Robust discussion of regulatory / legislative updates should be included to articulate what has changed since the AECOM 2017 Environmental Assessment.

Gap 3: As American Eel has been identified as potentially occurring within the Project Study Area and has been uplisted to Endangered status since the AECOM 2017 Environmental Assessment, a more robust argument should be included for why American Eel is not likely to be impacted by the proposed alternative (including description of properly sourced materials for critical habitat descriptions).

4.1.2.5 Recommendations

This Gap Analysis reviewed and evaluated information from six documents containing relevant details pertaining to the aquatic existing conditions within the Project footprint. Based on the results of the Gap Analysis, we recommend the following:

- To support the development of the RESA Environmental Assessment document and completion of relevant permitting, updated existing conditions data specific to the RESA footprint should be collected and incorporated into future studies. Specifically, updated field surveys should focus on collecting information regarding the current substrate and vegetation composition on the lakebed within and adjacent to the Project footprint. Further, any fish telemetry data should be incorporated to build a deeper understanding of the resident fish community within the Inner Harbour and surrounding areas. Any opportunities for data sharing among stakeholders should be encouraged; and,
- Incorporate into the RESA Environmental Assessment document and relevant permit applications (as applicable) additional details and robust discussion of regulatory changes.

PortsToronto is currently working with the Toronto and Region Conservation Authority to update fish and fish habitat existing conditions data. According to email communications dated (July 10, 2024), Toronto and Region Conservation Authority will undertake field data collection in 2024 and 2025 to identify the existing conditions of the Project Study Area. This includes:

- Fisheries monitoring – Toronto and Region Conservation Authority will conduct two sampling events within the project area in 2024 to determine the existing fish community. One sample will occur at night in summer, and one at night in fall. A spring sample will be collected during the day in 2025;
- Submergent aquatic vegetation and substrate – Toronto and Region Conservation Authority will complete daytime surveys in 2024 and map the submergent aquatic vegetation and substrate present on each side of the existing runway within the Project Study Area; and,
- Temperature loggers will be deployed in 2024 and 2025 between April to November each year, with one stationed on each side of the existing runway. Both will remain out of the exclusion and construction zone.

As Per AECOM's communication with Toronto and Region Conservation Authority , the results of the fisheries surveys will be shared with AECOM.

4.2 Marine Physical Environment

4.2.1 Overview of Completed Studies

As part of the Marine Physical Environment Gap Analysis, a review of relevant background information has been undertaken to document existing conditions and identify gaps and necessary updates, ensuring an accurate baseline for the Environmental Assessment process. The following documents have been reviewed and found to contain relevant information on the Marine Physical Environment. These reports and their pertinent details will be further summarized in the following sections.

- **Runway 08/26 RESA Alternatives Study. PortsToronto / Billy Bishop Toronto City Airport , Avia NG, 2024:**
  Avia NG completed a comprehensive technical review and analysis with combined inputs from PortsToronto, City of Toronto, and Transport Canada that provide a series of RESA alternatives for Runway 08/26 to achieve regulatory compliance. RESAs 1, 2, and 3 are the schemes that are moving forward and will be subject to evaluation as part of the current RESA Environmental Assessment. RESAs 1, 2 and 3 all include landmass/breakwater expansions at each end (west and east), with RESAs 2 and 3 expanding (compared to RESA 1) to include improvements to the Taxiway areas. RESA 3, with the largest footprint, includes an expansion of 82 metres from the seawall on the west end and 73 metres on the east. Design wave conditions were developed for each expansion.

- **Climate Change and Extreme Weather Vulnerability Assessment of PortsToronto Assets, AECOM, 2019:**
  In 2018, on behalf of PortsToronto, AECOM completed a risk assessment to understand the vulnerability of PortsToronto assets to climate change. As part of the risk assessment to understand potential impacts, a literature review of lake levels, ice, wind, and waves was conducted.

- **Toronto Islands Flood Characterization and Risk Assessment Project. Flood Characterization Report, Baird & Associates, 2019a:**
  On behalf of the Toronto and Region Conservation Authority , Baird and Associates undertook a flood characterization and risk assessment for the Toronto Islands. The report reviews the conditions that led to high water levels on Lake Ontario in 2017, updates to return period water levels, evaluates the impacts of the change in Lake Ontario Regulation Plans and reviews recent climate change studies related to future Lake Ontario water levels.

- **Updated Analyses using 2019 Water Levels, Baird & Associates, 2019b:**
  On behalf of Toronto and Region Conservation Authority, Baird & Associates updated the extreme water level analyses from the Toronto Islands Flood Characterization Report (2019), using water level data from 2019.

- **Gibraltar Point Erosion Control, Nearshore Reef Design Report, Baird & Associates, 2018:**
  Toronto and Region Conservation Authority retained Baird & Associates to complete the coastal engineering analysis and final design of the preferred alternative for the Gibraltar Point Erosion Control Project. A nearshore reef concept mimicking natural coastal features and improvements to aquatic habitat. The design also includes a sand management program, where sand will be placed strategically to protect Gibraltar Point and nourish Hanlan's Point Beach.

- **Gibraltar Point Erosion Control Project, Addendum Report, Toronto and Region Conservation Authority, 2018:**
  This document provides background on the preferred design at Gibraltar Point, including existing conditions, potential environmental effects, measures planned to mitigate any negative environmental effects, and the decision process for the revision of the preferred concept.

- **Modelling to Assess Water Quality Impacts from Runway End Safety Area, AECOM, 2018:**
  AECOM was retained by PortsToronto to conduct a water quality analysis to assess the likelihood of any, before and after, water quality impacts associated with the RESA landmass using a hydrodynamic model. The focus of the study area was on the Inner Harbour.

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017. (Appendix C-5: Marine Physical Effects Assessment, PortsToronto**, **AECOM 2015):**
  The Marine Physical Environment component was studied to evaluate the net effects and potential impacts related to the proposed runway extension, by a length of 200m on either side, as well as the introduction of jets at Billy Bishop Toronto City Airport.

- **Coastal Environmental Study Supporting the Expansion of Billy Bishop Airport, WSP Canada Inc, 2015:**
  As part of the feasibility studies regarding the lengthening of Runway 08/26 and other service upgrades at the Billy Bishop Toronto City Airport, WSP

documented the coastal environmental conditions that are sufficient to support the rock armour specification proposed as part of the design. Development of wave conditions for the National Research Council of Canada model testing and breakwater design was also completed.

- **Gibraltar Point Erosion Control Final Design. Baird & Associates, 2015:** The coastal engineering analysis and design report for the Gibraltar Point Erosion Control Project was completed to prevent further loss of recreational beaches, parkland, unique habitats, and existing infrastructure. The design process included quantifying the key erosion, deposition, and sediment transport processes at Gibraltar Point, evaluating the five erosion control alternatives and determine the preferred management approach, and preparing the final design.

- **Billy Bishop Toronto City Airport Lakefill Environmental Assessment Screening, Shoreline and Coastal Environment, Baird and Associates, 2012:**
  Baird and Associates was retained by Dillon Consulting to complete the assessment of coastal conditions, effects and mitigation for the Billy Bishop Toronto City Airport Proposed Lakefill Operation within Marine Exclusion Zone – Toronto Harbour Project. This included documenting the existing shoreline and coastal environmental conditions (field reconnaissance, lake levels, wave climate, currents, ice conditions, sediments etc.) as well as a screening level assessment based on site observations, aerial imagery, bathymetry, and geotechnical data. The objectives of this study were to provide an understanding of sediment processes and potential impact of the proposed works on the coastal environment.

4.2.2 Summary of Findings from Technical Studies

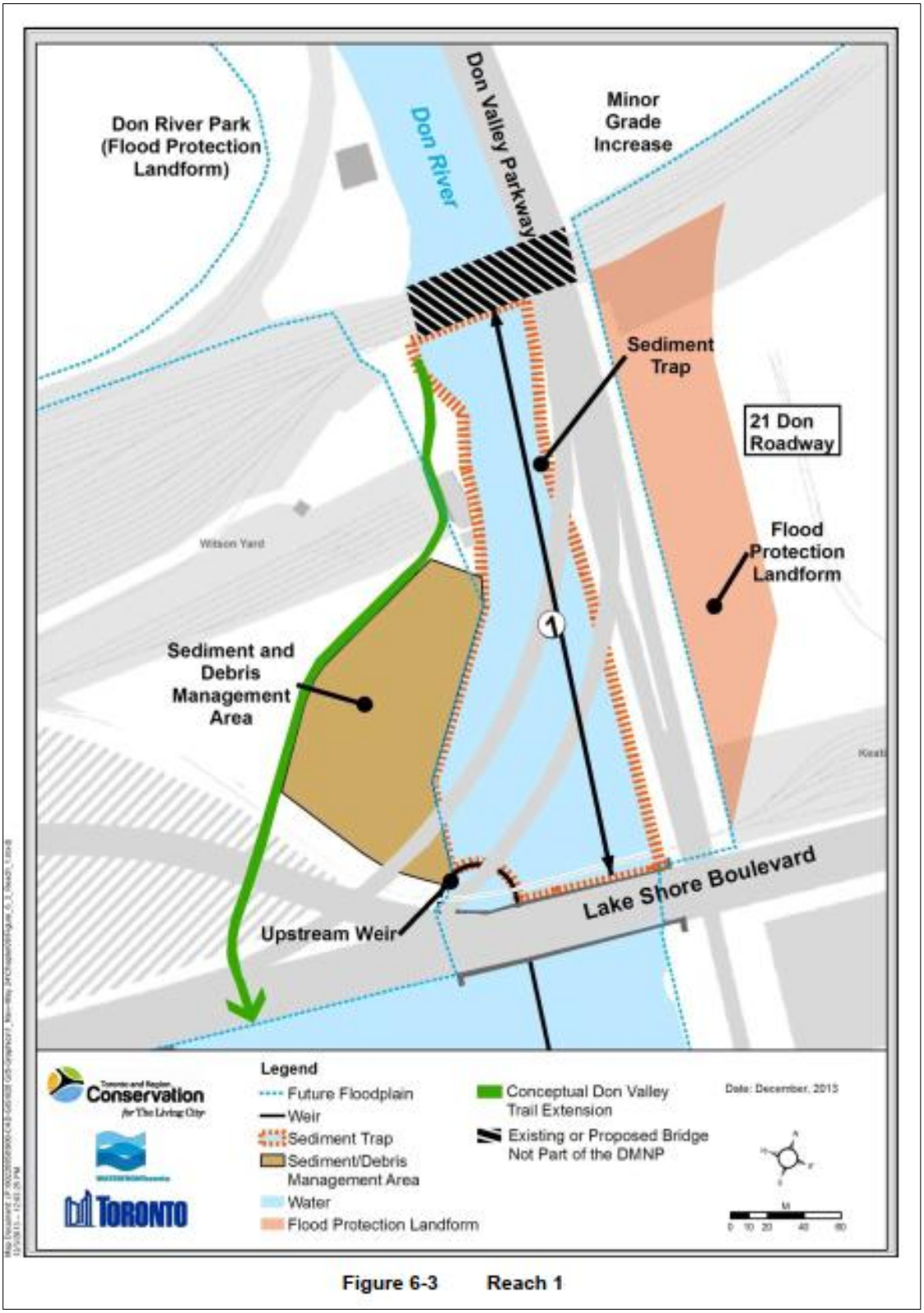
Shoreline Morphology

Appendix C-5 of the AECOM 2017 Environmental Assessment provides a detailed description of the physiographic and geologic environment as well as the existing shoreline morphology of the Project Study Area. The vast majority of the Lake Ontario shoreline has been significantly reinforced through traditional engineering interventions, where the north shoreline of Toronto Island has only partial engineering interventions (Baird & Associates, 2012). Along the south shoreline, sediment transport and erosional processes have led to the formation of Gibraltar Point and Hanlan’s Point Beach, as the sediment is transported northward (TRCA, 2018).

Recent changes to the shoreline morphology within the vicinity of the Project Study Area include the recent construction (2020 - 2021) and naturalization of the Don River Mouth. The previous and constructed Don River Mouth locations are in the same general locations, as reported in the recent Water Modelling Study (AECOM, 2018). The 100% Design Documents Package for the Port Lands Flood Protection and Enabling Infrastructure project indicates that the area downstream (south) of the Canadian National Railway tracks will be dredged and serve as a sediment trap. The drawings also indicate that a sediment and debris management area will be located on the west bank of the Don River, north to Lake Shore Boulevard (see Figure 4-1 taken from the Don Mouth Naturalization Project Environmental Assessment (TRCA, 2014)). Furthermore, the drawing also indicates that the width of the channel at Lake Shore Boulevard will be widened to approximately 120m from the current 40m (Michael Van Valkenburgh Associates, 2021). Baird and Associates (2012) studied the coastal environment within the study area and state that the naturalization of the Don River mouth will not significantly change the sediment sources and no obvious impacts on sediment processes in the Toronto Harbour will result from the proposed lakefilling associated with the Don River Naturalization Project.

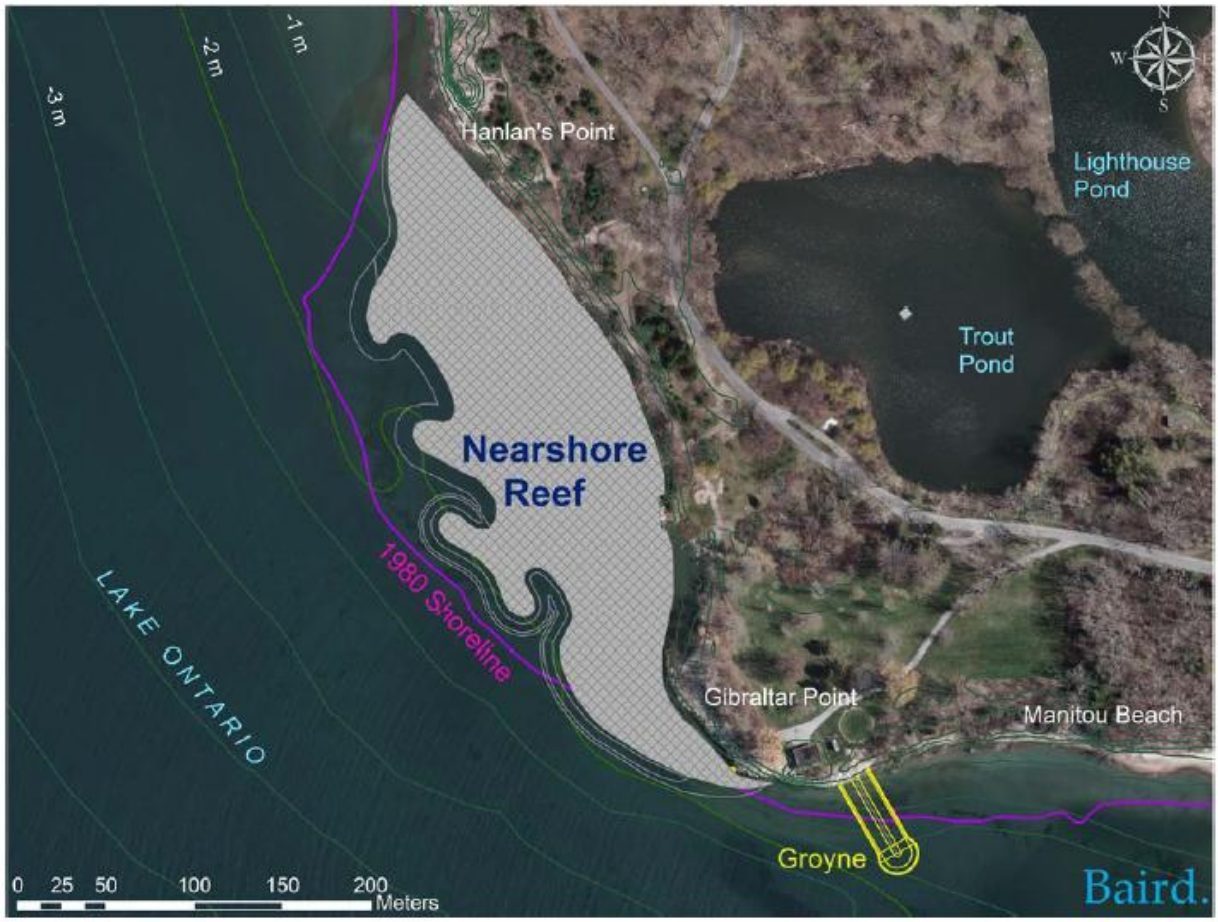
Most relevant within the study area, is the recently constructed Gibraltar Point Erosion and Sediment Control project along the west shoreline. The goal of the Gibraltar Point Erosion Control Project was to develop a long-term solution to address the shoreline erosion around Gibraltar Point (Baird & Associates, 2018). Most of the shoreline erosion occurs during southwesterly storm events at Gibraltar Point (Baird & Associates, 2018). The alongshore transport system at Gibraltar Point typically flows towards the north, especially during easterly storm events (Baird & Associates, 2018). Therefore, the erosion control solutions for this Project aim to reduce both the impact of southwesterly waves and the transport potential of the northward currents (Baird & Associates, 2018). The preferred design includes a nearshore reef concept that mimics natural coastal features. The proposed reef possesses an exterior perimeter submerged breakwater; the reef is then formed rock filling on the shoreward side of the perimeter of progressively smaller materials as the shoreline approaches, see Figure 4-2 (Baird & Associates, 2018). A groyne is also a key component of the proposed structures as shown in Figure 4-2, to reduce sand loss at the west of Manitou Beach (Baird & Associates, 2018). The design also includes a sand management program, where sand will be placed strategically to protect Gibraltar Point and nourish Hanlan’s beach (Baird & Associates, 2018). The construction of the nearshore reef and groyne structure was completed in June of 2021.

Figure 4-1: Lower Don River Proposed Conditions



Source: Adapted from Don Mouth Naturalization Project Environmental Assessment, TRCA, 2014.

Figure 4-2: Nearshore Reef and Groyne Design Layout for Shoreline Erosion Control at Gibraltar Point



Source: Taken from Baird & Associates, 2018.

Sediment

As previously reported in the AECOM 2017 Environmental Assessment , sediment sources are limited due to the heavily engineered shorelines, the regular dredging of the Keating Channel and limited sediment transport through the Eastern and Western Channels, except along the Hanlan's Point Beach and western extension area. The most recent sediment samples collected in the vicinity of the Project Study Area were collected in 2008 as part of the Gibraltar Point Erosion Control project. The Leslie Street Spit, constructed in the 1950s, now forms a major barrier to littoral transport from the east and is an area of deposition (Baird and Associates, 2012). Results from the previous air photo analysis (conducted in 2015) shows that sediment eroding from the southern end of the Hanlan's Point Beach and Gibraltar Point is likely being transported northward along the western shoreline (AECOM, 2017).

Changes to erosion and depositional patterns were previously assessed as part of the AECOM 2017 Environmental Assessment using available aerial imagery. Based on the review of available data as part of this gap analysis, no recent sediment sampling has been collected in the Project Study Area.

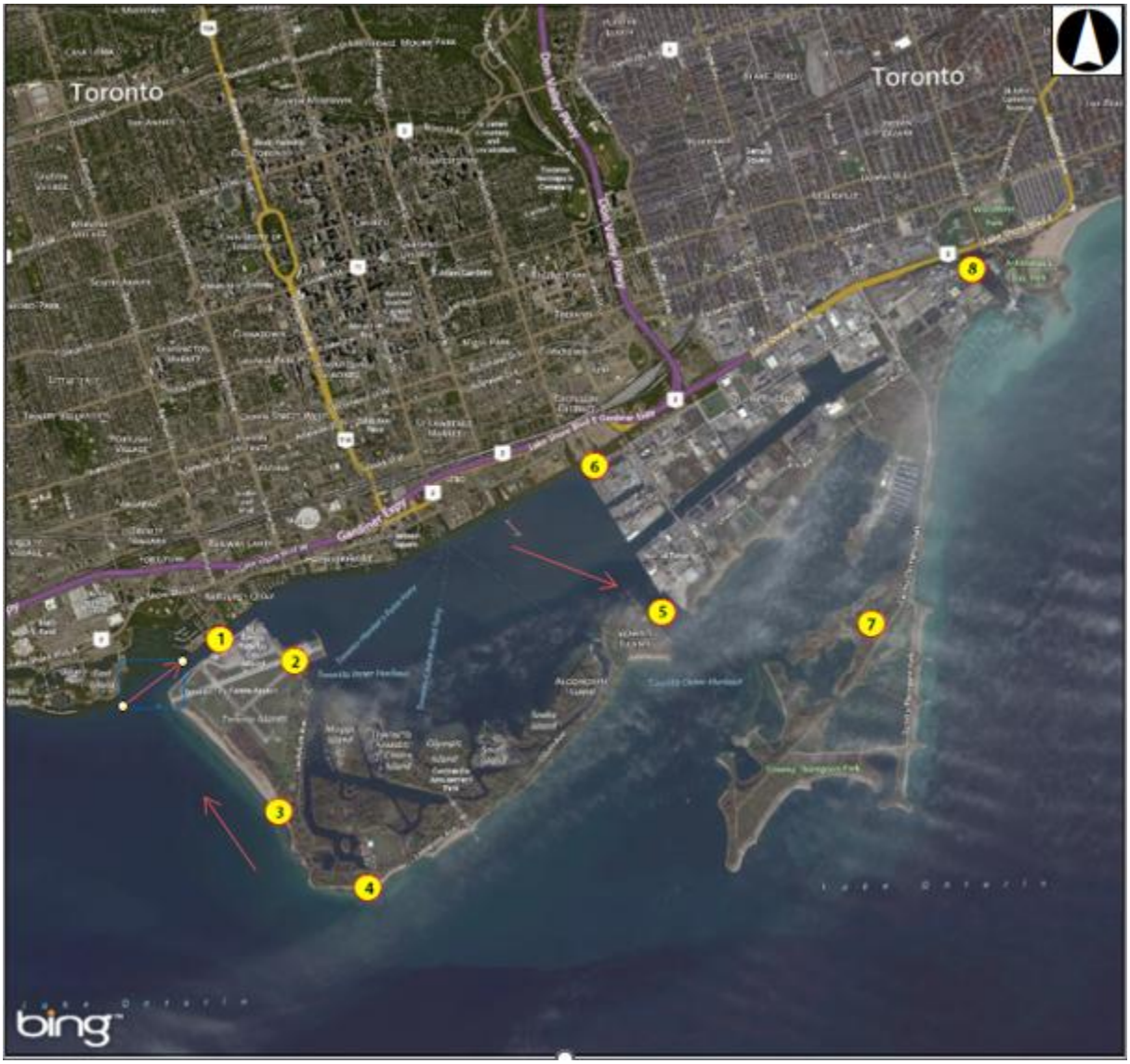
Sediment transport analysis was conducted by Shoreplan in 2007 for the Gibraltar Point Erosion Control Project Coastal Engineering Component, and more recently, Baird & Associates (2018). In addition, the Gibraltar Point Erosion and Sediment Control project has recently been constructed.

Further review of previous studies will be carried out by Shoreplan (AECOM Communication with Shoreplan, June 2024).

Currents

Baird and Associates (2012) noted an example estimate of surface currents, of 0.6 m/s during the 1-year return period wind speed of 18.9 m/s based on the existing data at that time. A comprehensive study was completed as part of the Class Environmental Assessment for the Don River and Central Waterfront (DRWC) Project, that assessed the main current pattern and strength within the Inner Harbour in 2012. On a seasonal basis, the net circulation is from the Western Beaches through the Western Channel into the Inner Harbour and out the Eastern Gap, depicted in Figure 4-3 below, adapted from the 2017 AECOM Environmental Assessment. The 2012 study also showed that a strong current comes from the Don River, and this was considered in a recent water quality modelling study (AECOM, 2018). Results of the 2018 water quality modelling study by AECOM identified that for the Western Channel, there is a measurable constriction created which results in elevated velocities. This will need to be considered during the current design for the west RESA as part of the current study.

Figure 4-3: Location of Billy Bishop Toronto City Airport Showing Net Circulation Movement (Arrows)



Note: *Circled Locations: 1. Western Channel; 2. Runway 08/26; 3. Hanlan's Point Beach; 4. Gibraltar Point; 5. Eastern Channel; 6. Keating Channel; 7. Leslie Street Spit; 8. Ashbridge's Bay.

Source: 2017 AECOM Environmental Assessment.

As part of the coastal and shoreline design considerations, Avia NG noted in the 2024 report that the impacts on currents and sediment transport will be greater for landmass expansion than a pile-supported deck extension and changes to currents and water circulation from both the east and west extensions could have impacts on water quality. Avia NG also note that the landmass expansion for the west RESA could impact sediment movement along the adjacent sand beach (Hanlan's Point Beach), and minimal impacts are expected relating to sediment transport for the east extension. It is

understood that a desktop review is being conducted by Avia NG and Shoreplan at this stage. Potential impacts to currents and sediment transport will need to be considered and documented within the preliminary design and environmental effects reviews.

Design Wave Conditions

As part of the coastal and shoreline design considerations, the Avia NG study confirmed in their 2024 report that wind generated waves dominate over ship/boat waves at both east and west runway ends. The 100-year return period design wave at the west end has a significant wave height of 3.5 metres and a peak wave period of 8.3 s. It is generated by a 107 km/h south-southwesterly wind. The 100-year return period design wave at the east end has a significant wave height of 1.2 metres with a peak wave period of 3.5 s. It is generated by a 100 km/h easterly wind (Baird and Associates, 2012).

Ice

Ice forces acting on the structures are as described in the Canadian Highway Bridge Design Code (CAN/CSA S6-06), which are summarized as:

- Dynamic ice forces from moving sheets or floes driven by wind or currents;
- Static ice forces due to thermal movement of continuous stationary ice sheets;
- Lateral thrust due to arching action resulting from ice dams or ice jams; and,
- Static or dynamic vertical forces because of fluctuating water levels or dynamic effects of colliding ice floes.

Ice loads exerted on shoreline structures are directly related to the ice thickness and the ice strength. Design loads are typically required for piled structures, including steel sheet pile walls, but not for sloped revetments. Ice that rides up sloped structures typically bends and breaks without exerting design loads on the revetment, although that process can lead to ice inundation. The mechanisms of ice inundation can be broken into shoving, jamming, pile-up and ride-up although events typically consist of combinations of these mechanisms. There are no specific calculations that can be carried out to accurately determine a particular site’s vulnerability to ice inundation. The potential for ice inundation is site specific and is best assessed using site specific observations.

Ice pile-ups of 1 to 2 metres in height have been reported at the steel sheet pile wall on the west end of runway 08/26. Ice inundation has not been reported for the east end of the runway. Freezing spray can also be an issue for airport operations. Spray has been

reported to produce ice up to 0.3 metres thick extending onto the pre-threshold pavement on the exposed western shore. This is a common annual occurrence.

Water Levels

Baird & Associates (2019) completed the most recent assessment of water levels at Toronto and recommended that 76.2 metre International Great Lakes Datum 1985 be the 100-year instantaneous water level used for design. This has been informally adopted by the Toronto and Region Conservation Authority, who is the approving agency for shoreline works along most of Toronto's waterfront. While Toronto and Region Conservation Authority does not have jurisdiction on this Federal project, using a design water level of 76.2 metres is consistent with other work recently completed in this area.

This design water level is the result of a combined probability analysis of Lake Ontario mean water levels and wind setup (storm surge) heights at Toronto. It includes an additional 0.07 metre allowance for the potential impacts associated with the most recent International Joint Commission water level regulation (IJC Plan 2014).

4.2.3 Compliance and Governance Requirements

City of Toronto Official Plan

The natural environment policies in Chapter 3 of the City Official Plan specifically address lake filling projects in Lake Ontario (Policy 17), indicating that such projects will only be supported where:

- *"The land created will be used for natural habitat, public recreation or essential public works;*
- *The project has been the subject of an Environmental Assessment which ensures that water quality and quantity and terrestrial and aquatic habitat will be protected or enhanced; and,*
- *The project does not create new or aggravate existing natural hazards".*

The following Chapter 3 policies are relevant to the Marine Physical Environment:

- "….*Public and private city-building activities and changes to the built environment, including public works, will be environmentally friendly based on:*
- *Policy 1.e: reducing the risks to life, health, safety, property and ecosystem health that are associated with flooding, unstable slopes, erosion and*

contaminated lands and considering the potential impacts of climate change that may increase the risk associated with natural hazards;…

- *Policy 8: Development will be set back from the following locations by at least 10m or more if warranted by the severity of existing or potential hazards;…*
- *Policy 8.c: Other locations where slope instability, erosion, flooding, or other physical conditions present a significant risk to life or property; and,*
- *Policy 8.d: Other locations near the shoreline which may be hazardous if developed because of flooding, erosion or dynamic beach processes.*
- *14. Areas of land or water within the natural heritage system with any of the following characteristics are particularly sensitive and require additional protection to preserve their environmentally significant qualities:*

  B) Rare, high quality or unusual landforms created by geomorphological processes within the City or the Greater Toronto Area."

Ministry of Natural Resources Natural Hazard Policy

Section 3 and Section 6 of the Ministry of Natural Resources Technical Guide for Understanding Natural Hazards (2001) discusses the Provincial Natural Hazard Policies relating to the Great Lakes as follows:

- Policy 3.1.1 Development will generally be directed to areas outside of;
  a) Hazardous lands adjacent to shorelines of the Great Lakes – St. Lawrence River System and large inland lakes which are impacted by flooding, erosion, and/or dynamic beach hazards.
- Policy 3.1.2 Development and site alterations will not be permitted within:
  a) Defined portions of dynamic beach.
- Policy 3.1.3 Except as provided in policy 3.1.2, development and site alteration may be permitted in hazardous lands provided that all the following can be achieved:
  a) The hazards can be safely addressed, and the development and site alteration is carried out in accordance with established standards and procedures;
  b) New hazards are not created and existing hazards are not aggravated;
  c) No adverse environmental impacts will result;
  d) Vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies; and,

e) The development does not include institutional uses, essential emergency services or the disposal, manufacture, treatment or storage of hazardous substances.

Section 6.1 lays out the criteria considered when determining flood hazards along the Great Lakes; this includes the 100-year flood level, as well as the flood allowance for wave uprush and other water related hazards (such as ship-generated waves, ice piling, and ice jamming).

Section 6.2 lays out the components for determining erosion hazards along the Great Lakes; this includes the stable slope allowance, average annual recession rate and the erosion allowance.

Section 6.3 defines the dynamic beach hazard limit. The dynamic beach hazard limit is the combined flooding hazard limit (the 100-year flood level plus an allowance for wave uprush and other water related hazards), plus the dynamic beach allowance of 30m on the Great Lakes. If the dynamic beach is subject to erosion or is receding, a horizontal distance based on the 100-year erosion rate is added as well to the above hazard limit described.

4.2.4 Gap Identification

Based on the completed gap analysis, all the information and data are currently available in previous studies, with multiple recent studies since AECOM's 2015 study, requiring no new research or information collection. Therefore, no gaps have been identified for the Marine Physical component of this study.

It is understood that Shoreplan Engineering is currently undertaking a desktop review to confirm the existing sediment transport data that are available and that no gaps have been identified from Shoreplan Engineering.

4.2.5 Recommendations

Based on the results of the gap analysis, as identified above in **Section 4.2.4**, AECOM's marine physical team will continue communication with other disciplines, specifically water quality and aquatics for any further updates to water quality and aquatic environment existing conditions (if any).

4.3 Water Quality Assessment

4.3.1 Overview of Completed Studies

There have been numerous studies and data collection efforts within the Inner Harbour to characterize issues related to water quality in the harbour. The following were the primary relevant studies:

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017 (Appendix C-6: Billy Bishop Toronto City Airport Environmental Assessment Phase II: Inner Harbour Circulation and Water Quality Cumulative Net Effects Assessment, AECOM, 2015):**
  The water quality assessment in AECOM's 2015 Inner Harbour Circulation and Water Quality Cumulative Net Effects Assessment study (AECOM's 2015 Water Quality study) provided in this referenced appendix, completed a review of previous environment reports related to water quality, bathymetry, water levels, Don River inflows, and circulation patterns in the harbour. The AECOM's 2015 Water Quality study noted that overall water quality in the harbour is expected to improve significantly over time as a result of concurrent initiatives by the City (Combined Sewer Overflow reductions, and the Don Mouth Naturalization and Port Lands Flood Project). AECOM's 2015 Water Quality study identified that the proposed runway extension on the west side, however, could reduce the cross-sectional flow area where currents enter the harbour at the western channel gap by up to 50%, which potentially would reduce average inflows to the Inner Harbour and increase hydraulic residence time in the harbour. Increasing the hydraulic residence time in the harbour would inhibit flushing of the harbour with cleaner lake water and have potential water quality impacts. AECOM's 2015 Water Quality study recommended further detailed analysis using 3-D hydrodynamic modelling to further assess these potential impacts. This assessment was subsequently performed by AECOM in 2018 (referenced below).

- **Appendix N – Hydrodynamic and Sediment Transport Modelling Memorandums, Don Mouth Naturalization and Port Lands Flood Protection Project, Baird, June 2010:**
  The Baird 2010 study focused on the Don River. While the modelling extent only included a small portion of the Inner Harbour, the study provided Don River inputs to the model (i.e., flow) and also helped define the planned future conditions that will be part of the Don Mouth Naturalization Project.

- **Class Environmental Assessment Study Report, City of Toronto's Don River and Central Waterfront Project – MMM, April 2012. Appendix 3.3: Toronto Inner Harbour Water Quality Modelling Report, Modelling Surface Water Limited, April 2012:**
  The referenced Class Environmental Assessment was completed in 2012 in support of the long term strategy in the City of Toronto to reducing the impacts of stormwater runoff and combined sewer overflows on water quality in Toronto Harbour. Modelling Surface Water Limited (Dr. Ray Dewey) produced a stand-alone appendix report included in the above 2012 Class Environmental Assessment. The study included the whole Inner Harbour and focused on water quality from a beach closure perspective (i.e., how many Blue Flag days occurred). While the model of the Inner Harbour was coarse (90m grid), it was very useful in establishing the predominant current pattern in the Inner Harbour.
  The study also identified and assessed wider influences of water quality in the Inner Harbour in the current and longer trend, and considered such things as changes to water quality loadings, and current Combined Sewer Outfalls and future Combined Sewer Overflow mitigation planned by the City. It is our understanding that the City of Toronto currently has a comprehensive water quality model of the harbour that is an update of these works.
- **Modelling to Assess Water Quality Impacts from Runway End Safety Area (RESA), AECOM, 2018:**
  The AECOM 2018 study was an update study to Modelling Surface Water Limited 2012 study, performing 3-dimensional modelling of currents and circulation patterns in the harbour under existing conditions and under a RESA landmass expansion (60m west, 75m east) that is similar to RESA 3. The model used a finer grid (10m) extending for the entire harbour and incorporating all relevant harbour flow elements (Western Channel and Don River inflow, Eastern gap outflow) using the Flow3D software. The study is the most comprehensive to date that looks at water circulation patterns in the harbour and draws relevant conclusions regarding the potential changes in these patterns following RESA works and the corresponding potential changes in water quality.

4.3.2 Summary of Findings from Technical Studies

Some of the major findings and details provided in previous technical studies are:

- A comprehensive bathymetric data set was obtained from the Canadian Hydrographic Services in 2015, which formed the basis for previous studies of

currents and flushing dynamics in the Harbour. This was a large improvement from previous available bathymetric information;

- The Modelling Surface Water Limited Study (2012) found that the main direction of discharges from the Don River is for the Don River plume to discharge west toward the middle of the Inner Harbour, but for the plume to mix with the Inner Harbour water and to then be directed toward the Eastern Gap. 3D harbour current simulations performed as part of the 2018 AECOM study found the Don River plume rapidly turned south upon entering the harbour, flowing south closely along the shoreline towards the eastern gap outlet from the harbour;
- Planned improvements to the Don River mouth were reviewed in the Baird 2010 study. It concluded that moving the Don River outlet would improve water quality;
- The Modelling Surface Water Limited Study (2012) identified the main currents in the Inner Harbour as entering the harbour through the Western Channel and out the eastern gap; and,
- The AECOM 2018 study, performing 3-dimensional modelling of the harbour currents, concluded that there is no water quality impact from the Don River associated with the RESA landmass, with either the existing or future location of the Don River outlet. The Don River has weak momentum characteristics compared to the stronger current across the Inner Harbour from the Western to Eastern gap. Currents from the Don River stay close to the eastern side of the harbour, flowing south out the Eastern Gap, and the flow paths are not impacted by the RESA landmass. The AECOM 2018 study also showed that there is minimal to no impact to flushing of the harbour or current patterns within the harbour caused by the RESA landmass. The RESA landmass encroachment to the harbour is within an eddy zone where the flows entering the harbour through the Western Channel do not directly circulate (see Figure 4-4 extracted from the AECOM 2018 Study).

Figure 4-4: Current Velocities in Toronto Harbour – 3D Model Results

Source: AECOM, 2018.

The AECOM 2018 study also showed that entrance velocities increased slightly in the Western Channel as a result of RESA landmass expansion (60m west, 75m east), but this will have no water quality impacts in the harbour.

4.3.3 Compliance and Governance Requirements

The harbour has typically been negatively affected by contaminated waters from the combined loadings of the Don River and the numerous storms and Combined Sewer Overflow, as well as point sources of contamination such as the shipping channel at the Toronto Port Lands. The Toronto and Region Remedial Action Plan and Aquatic Habitat Toronto are addressing water quality in the Toronto waterfront areas.

There have been frequency concentrations of nutrients and fecal coliform bacteria along the entire Toronto Waterfront that are above the Provincial Water Quality Objectives.

The City of Toronto is actively addressing water quality in the harbour through a number of ongoing initiatives. The DRWC and Connected Projects program will greatly improve water quality in the harbour by capturing, storing, and treating existing Combined Sewer Overflow to the harbour. The City's Wet Weather Flow Master Plan (implemented in 2003) is also reducing the impacts of stormwater runoff to the harbour.

It is expected that Combined Sewer Overflow and pollutant sources from the Don River will be significantly decreased and the overall water quality of the Inner Harbour enhanced for future conditions, as a result of these ongoing measures. The naturalization of the Don Mouth as part of the Don Mouth Naturalization Project will include a new Don River valley system located approximately halfway between the Ship Channel and Keating Channel. Improved water quality from the Don River is expected within proposed lake-connected wetlands.

The previous studies have not indicated any impacts to harbour water quality, associated with the proposed runway landmass, and there are no expected compliance or governance requirements associated with water quality that would be triggered by the proposed RESA landmass.

4.3.4 Gap Identification

The previous studies have suitably identified the factors associated with the RESA that potentially affect water quality in the harbour and have demonstrated with high confidence that the impacts to water quality are likely to be minimal or negligible. There are some small gaps in applying the findings of previous studies to the current RESA alternatives, as follows:

- **Gap 1:** A comprehensive up-to-date review of water quality loadings to the harbour from all sources under existing and future conditions has not been acquired or reviewed. The City of Toronto should be engaged to provide and comment on their current water quality modelling of the harbour.
- **Gap 2:** The 2018 3-dimensional modelling of harbour circulation only considered the existing Don River outlet to the harbour via the Keating Channel; future conditions will consist of the shift of the Don River outlet south of the Keating Channel.
- **Gap 3:** There are two main aspects to water quality in the harbour: the pollutant loadings from land-side sources during rainfall events (primarily Combined Sewer Overflow, storm outfalls, and the Don River), and the ‘flushing’ of the harbour with cleaner lake water following the event. The primary measure of the effectiveness of this ‘flushing’ of pollutants from the harbour is the hydraulic residence time of water in the harbour. While pollutant loadings are expected to be reduced in the future (through the Combined Sewer Overflow storage works implemented in the Don River and Central Waterfront project, and through ongoing implementation of the Wet Weather Flow Master Plan), this is not formally addressed in the previous work. While the proposed RESA landmass is now not expected to significantly change the hydraulic residence time in the harbour, this is not explicitly stated. In addition, the changes in hydraulic residence time associated with relocating the Don River outlet are not explicitly estimated.

4.3.5 Recommendations

The previous work identifying the factors affecting water quality in the harbour clearly indicated that the previously considered runway extension had negligible impact on water quality. It was also clear that any extremely small changes in water quality due to changes in circulation and hydraulic residence time in the harbour would be negligible in context of the large improvements in water quality expected as a result of future Combined Sewer Overflow storage and ongoing stormwater quality improvements as part of the Wet Weather Flow Master Plan. Given that the current proposed RESA expanded landmass is a smaller encroachment into the harbour than the previously considered runway extension, the potential impacts to water quality are expected to be even less than previously assessed. Given the above, additional modelling of water quality work is not recommended. The City of Toronto should be engaged to provide and comment on their current water quality modelling of the harbour. Further discussions with the City of Toronto are recommended to understand up-to-date water quality modelling undertaken by the City to confirm this understanding and these recommendations.

4.4 Socio-Economic Assessment

4.4.1 Overview of Completed Studies

Four relevant prior studies were reviewed for this Gap Analysis including:

- **Toronto's Downtown Airport, A Powerful Economic Asset in the City's Urban Core. Richard Florida and the Creative Class Group, 2023:** Comprehensive and detailed with a compelling story for how the Billy Bishop Toronto City Airport is a catalyst for economic development in Toronto, while providing many social benefits.
- **Billy Bishop Toronto City Airport , 2017 Economic Impact Study, InterVistas, 2017:** Provides a detailed assessment of the benefits derived from the operations of Billy Bishop Toronto City Airport . It generates estimates direct and indirect employment, tax generation to multiple levels of government, and contribution to Gross Domestic Product.
- **Billy Bishop Toronto City Airport Sustainability Report. Delphi Group, 2022:** Provides a high-level overview of how Billy Bishop Toronto City Airport scores on a variety of sustainability metrics. Two of particular relevance to this Gap Analysis are:
  - Community & culture; and,
  - Economic development & contribution to employment.

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM. 2017 (Appendix C-9: Socio-Economic Effects Assessment, 2017):**
  The socio-economic section provided the foundation for this Gap Analysis.

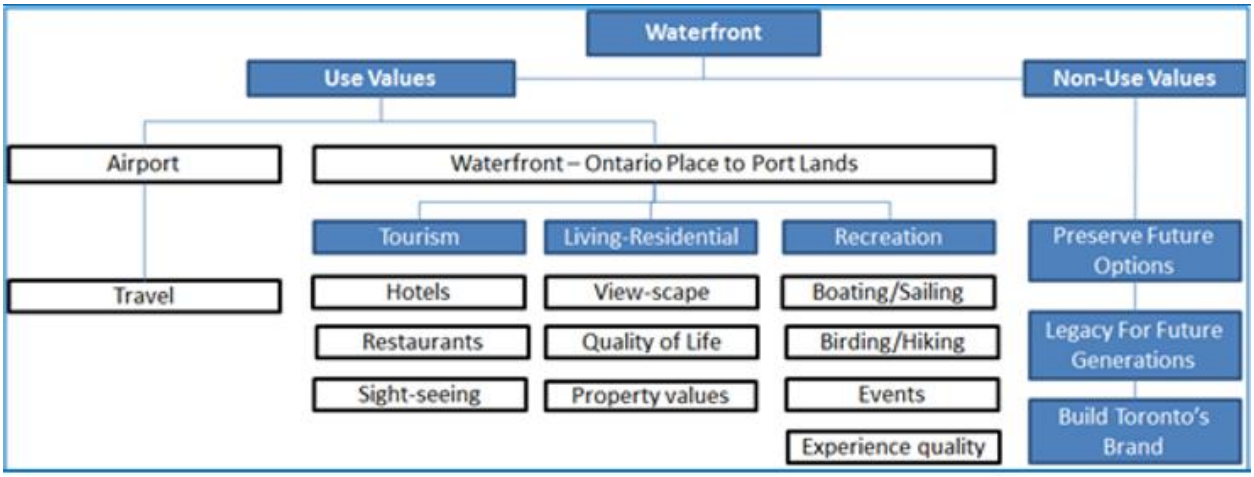
Other studies of relevance which may be referenced in future desktop research include:

- Economic Impacts of the Port of Toronto, Martin Associates, 2018;
- RESA Route and Emissions Modelling for Ports Toronto, AirTrav Inc. and ICF Aviation, 2023;
- Toronto's Downtown Airport, A Powerful Economic Asset in the City's Urban Core, Creative Class Group, 2023; and,
- 2018 Airport Master Plan, Billy Bishop Toronto City Airport, 2018.

4.4.2 Summary of Findings from Technical Studies

For the AECOM 2017 Environmental Assessment , the social effects assessment considered a variety of social values that were categorized into "Use" and "Non-Use" values as illustrated in Figure 4-5 below. These social values were identified through public meetings and interviews with selected stakeholders.

Figure 4-5: What Stakeholders Value about Toronto's Waterfront in 2017



Not all the information is needed for this RESA Environmental Assessment , however much of the information collected for the AECOM 2017 Environmental Assessment is still accurate and relevant, although some components require updating to reflect

changes in the Waterfront area. The following questions will help to narrow the scope of what is needed for the RESA Environmental Assessment (Refer to Table 4-2).

Table 4-2: Scoping Questions and Resolutions

Scoping Questions	Resolution
Does one need to verify both use and non-use values as before?	■ Use values should be the only focus; and, ■ Non-use values can be leveraged from prior AECOM 2017 Environmental Assessment since it required extensive surveys and is likely unchanged.
Have the findings of the InterVistas 2017 economic study changed enough to warrant remodelling?	■ Likely no; ■ This study provides an "order of magnitude" estimate of the direct and indirect benefits; and, ■ Results are likely more representative of a non-pandemic economy.
Has the social environment changed enough requiring an update to other social values?	■ Likely yes; and, ■ The degree of new development (e.g., Port Lands, new residential, and commercial), and population dynamics may have influenced current social values, such as: ○ Ontario Place; and, ○ Bathurst Quay.
Can the sought after information be collected and assessed within the time schedule allotted?	■ Yes, if only a selection of public and stakeholder interactions can be accommodated; and, ■ A work scope that targets input from key representative stakeholders can be accomplished in a short time frame.

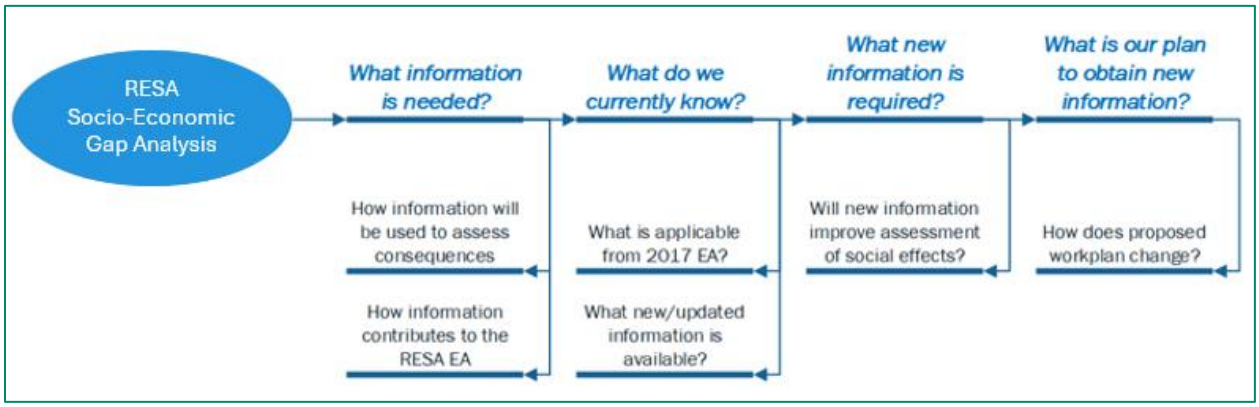
4.4.3 Compliance and Governance Requirements

Since the RESA Environmental Assessment is subject to a voluntary non-statutory process, socio-economic assessment is not governed by any mandatory legislative requirements, regulatory guidelines or codes of practice. However, PortsToronto has chosen to voluntarily assess the potential socio-economic effects. This assessment follows the best practices as part of the voluntary Environmental Assessment process to proactively address potential socio-economic effects and gain public and stakeholder support.

4.4.4 Gap Identification

This RESA Gap Analysis relating to possible socio-economic consequences has identified what information/data are available relative to what is needed for this Project (Refer to Figure 4-6).

Figure 4-6: RESA Socio-Economic Gap Analysis



This review has generated the gap in required information, which is outlined below.

Gap 1: The gap analysis proposes that the previously identified non-use and use values associated with the Waterfront have remained the same, though, due to the changing population dynamics, it is important to update the conditions of the existing use values, including:

- Residential;
- Recreational;
- Institutional;
- Economic;
- Tourism;
- Municipal implications; and,
- Property values.

To verify whether these conditions have indeed changed and how, it is essential to conduct desktop research and consult with community members and gather insights on their current needs and preferences. For example, additional development in the Port Lands, around Bathurst Quay, and prospective changes at Ontario Place have resulted in an increased population and new and proposed residential and recreational areas along the Waterfront which need to be described and understood in relation to the airport. Further, the current local population, business owners, and recreational users of the Waterfront may have differing perspectives on the use values previously identified and will need to be updated.

Gap 2: The gap analysis assumes that the Project effects will be different, as this Project seeks to continue the existing operations of the airport instead of expanding operations. Additional considerations should be made to understand what impacts will occur if the airport is no longer operational.

4.4.5 Recommendations

Much information is currently available and relevant for this study, while some new information is required to update/confirm current conditions and potential effects to identified social values.

- Existing information that will be leveraged for this RESA Environmental Assessment relating to the Economic Use Value are detailed in:
  - Toronto's Downtown Airport, A Powerful Economic Asset in the City's Urban Core, Richard Florida and the Creative Class Group, 2023; and,
  - Billy Bishop Toronto City Airport, 2017 Economic Impact Study, InterVistas, 2017.

Given the completeness of these studies, no further research relating to direct and indirect economic employment and tax benefits is required. The economic modelling used to generate employment and tax benefits linked to Billy Bishop Toronto City Airport is relevant, particularly if one uses this information to express an "*order of magnitude"* outcome for these variables.

Florida's 2023 study effectively describes the economic development opportunities afforded by Billy Bishop Toronto City Airport , which can be summarized in this RESA Environmental Assessment. Both studies anchor the economic benefits portion of the assessment quite well.

It is suggested that a more current assessment of waterfront use values be developed to cross reference for possible consequences relating to the RESA.

This will include information gathering in two stages:

- A desktop review of existing published sources of information pertinent to this work scope is an important first step in furthering our knowledge. The following example sources include:
  - 2017 Economic Impact Study, InterVistas, October 2017;
  - Economic Impacts of the Port of Toronto, Martin Associate, 2018;
  - Toronto's Downtown Airport, A Powerful Economic Asset in the City's Urban Core, Creative Class Group, 2023; and,
  - 2018 Airport Master Plan, Billy Bishop Toronto City Airport, 2018.
- The next stage will include targeted interviews and engagement with stakeholders that represent views, values, and interests of residents,

recreation users, local businesses, and tourism, and can be accomplished in a short period of time.

The information assembled from above will be organized in a manner suitable for consequences for both use and non-use values of the Waterfront. This will involve the generation of tables and illustrations consistent with the assessment framework used in the AECOM 2017 Environmental Assessment . While this assignment regarding RESA is different from before, our Gap Analysis has confirmed that the primary social considerations associated with the Waterfront, and therefore the use values and non-use values, are largely unchanged. Our analysis and assessment will assume equivalent considerations but is flexible to changes that may be required as a result of the desktop research and interviews.

The analysis and assessment phase will generate or confirm current baseline conditions and social perspectives (qualitative) regarding the current uses and non-uses of the waterfront area. This will be followed by an effects assessment for the key social value components associated with the Waterfront uses and non-uses. Possible mitigation measures for negatively affected values will be provided.

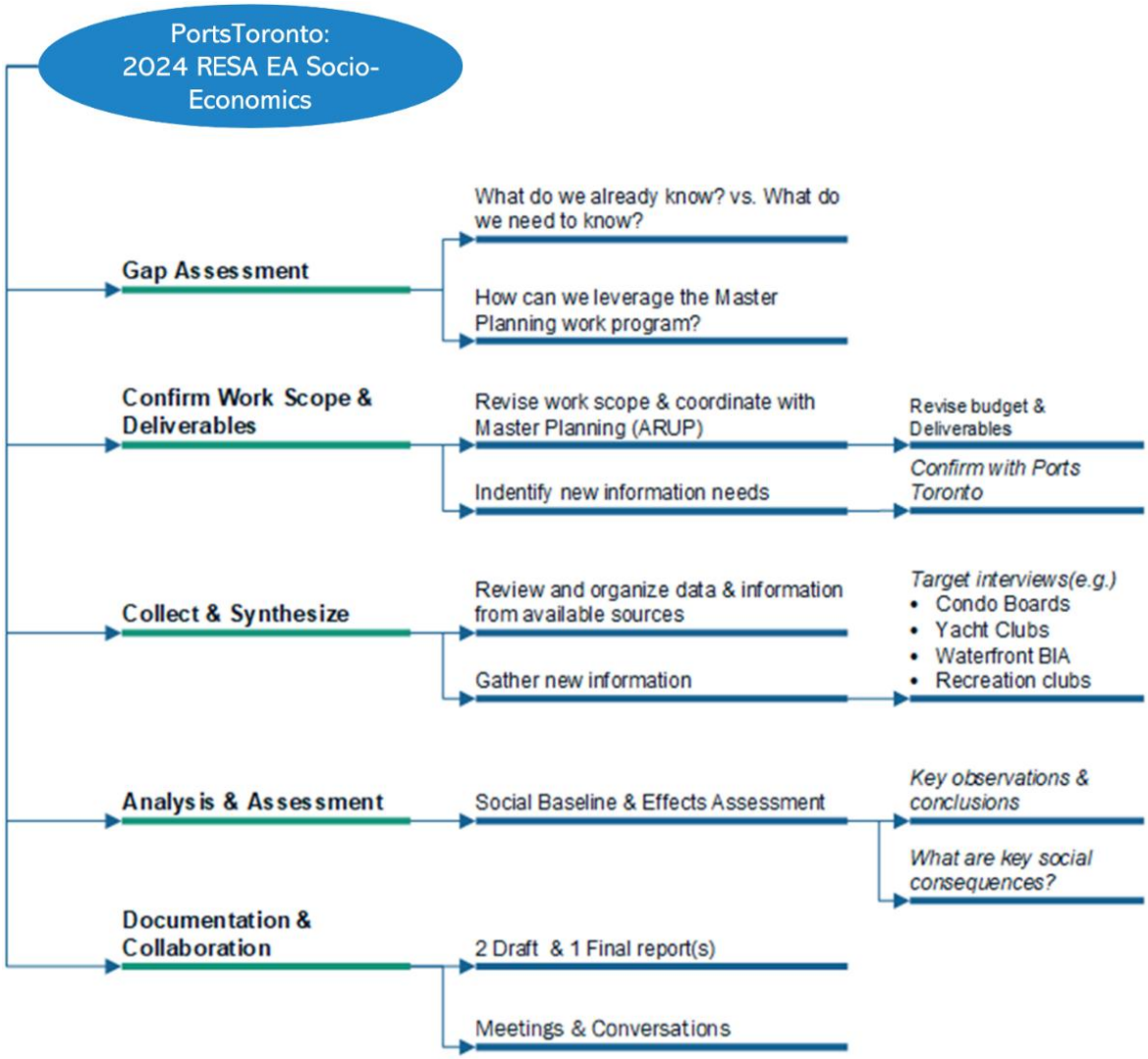
This work will “tell the story” of how the RESA implementation may possibly affect people who live, work, or play in the areas affected by the airport, related in the context and format of the full Environmental Assessment. A Socio-Economic Effects Assessment Report will be generated that will detail:

- Objectives and scope;
- Methods and approach;
- Analysis and assessment; and,
- Conclusions.

In summary, please refer to the figure below for an overview of the socio-economic scope for the Project.

The results of the gap analysis confirmed that the socio-economic component of the RESA Environmental Assessment needs to be updated as per AECOM ‘s proposed work program (refer to Figure 4-7)**.**

Figure 4-7: 2024 Socio-Economic Work Plan



4.5 Marine Navigation

4.5.1 Overview of Completed Studies

The following studies were reviewed for this gap analysis:

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017 (Appendix C-4: Marine Navigation Net Effects Assessment, AECOM, 2016):**
  The memorandum summarized the existing wind and wave conditions, estimated the jet blast velocities and assessed the impact of the runway extension on vessel navigation if the runway was extended to accommodate

jet airplanes. Recreational vessels were determined to be the most vulnerable to changes particularly at the Western Channel where the entrance would be reduced in width and vessels could be impacted by jet blast.

- **Preliminary Runway Design Billy Bishop Toronto City Airport, Coastal Environment Study, WSP Canada Inc, 2015:**
  WSP Canada produced a coastal study to publish known bathymetry, water levels, and determine the offshore and nearshore wave climate. This study was referenced within the AECOM Marine Navigation Net Effects Assessment listed above. Return periods on extreme high-water levels and wave height were determined along with the seasonality of the water levels and wave climate on Lake Ontario.

4.5.2 Summary of Findings from Technical Studies

Existing Wind, Wave and Current Conditions

- **Wind**
  WSP Canada analyzed wind data from 1971 to 2014 using a wind station at the Airport. Dominant winds are from the west to southwest and east directions with maximum wind speeds of 80 km/hr. Winds are most frequently in the 15-20 km/h speed range. High winds tend to occur in the winter and autumn in Toronto.
- **Waves**
  WSP also determined the nearshore wave distribution frequency at the Airport using the 1971 to 2014 wind data set. Waves are most common in the southwesterly direction with over a 45 km wind fetch distance. Wave height is most frequently between 0.05 to 0.2 m. The Avia NG study determined the significant wave heights for a 100-year return period winds and using bathymetry from 2015. They found the western end of the runway had a significant wave height of 3.5 m, peak wave period of 8.3 sec and the eastern runway end had a significant wave height of 1.2 m, peak wave period of 3.5 seconds.
- **Currents**
  Net circulation of flow though the Inner Harbour is from the Western Channel through the Inner Harbour and out the Eastern Gap. Maximum current velocities in the Western Channel were measured at 0.52 m/s (AECOM, 2017, App C-6). Water circulation in Lake Ontario is driven by wind stress and density-driven currents due to thermal differences. Climate change is expected to increase storm frequency and intensity and introduce greater uncertainty over future water levels. The AECOM 2017 Environmental Assessment study showed that factors impacting recreational boaters including wind, currents, waves and water depth are not expected to significantly change from the undertaking evaluated in support of the AECOM 2017 Environmental Assessment.

Marine Navigation Adjacent to the Runway

Commercial vessels enter and exit the Inner Harbour via the Eastern Gap and recreational vessels frequent the Western Channel ranging from canoes to motorboats (AECOM, 2017). The area at the entrance to the Western Channel could have a reduced width if lakefilling is required within the Marine Exclusion Zone to accommodate the RESA and this could make the maneuverability of the Western Channel more challenging for local recreational boaters. Currents through the Western Channel could increase with the narrowing of the entrance.

4.5.3 Compliance and Governance Requirements

The Fisheries and Oceans Canada runs the Small Craft Harbours program that operates and maintains a national system of harbours for small vessels. There is some guidance known for small craft navigation and channels. The United States Army Corps of Engineers Design for Small Craft Berthing Facilities (UFC 4-152-07) recommends a minimum channel width for small craft to be 5 times the beam of the widest vessel expected[1]. The Permanent International Association of Navigation Congresses adds extra restrictions on channel width depending on vessel speed, crosswinds, currents and waves (Permanent International Association of Navigation Congresses, 1997). Although the guideline is targeted at commercial vessels, it is referenced in American Society of Civil Engineers (2012)[2]. Safe Waterways: Guidelines for the Safe Designs of Commercial Shipping Channels[3] also references the Permanent International Association of Navigation Congresses 1997 guideline.

According to the Toronto Port Authority Practices and Procedures, under Canada Marine Act Section 56[4], vessel speed limits within the limits of the Port & Harbour of Toronto area is 5 knots within 150 m of any shoreline or breakwater and otherwise 10 knots elsewhere within the Inner and Outer Harbours. Small craft operating within the area are to comply with the Small Vessel Regulations of the Canada Shipping Act (https://laws-lois.justice.gc.ca/eng/regulations/sor-2010-91/) which stipulates licensing and safety requirements.

1. The UFC is for US department of Defense small craft which will be used just for reference.
2. American Society of Civil Engineers, Planning and Design Guidelines for Small Craft Harbors, 3rd Edition, American Society of Civil Engineers Manuals and Reports on Engineering Practice No. 50. Published by COPRI (Coasts, Oceans, Ports and Rivers Institute) under American Society of Civil Engineers.
3. https://www.ccg-gcc.gc.ca/publications/waterways-voies-navigables/safe-waterways/index-eng.html
4. https://www.portstoronto.com/port-of-toronto/about-us/safety-and-security/practices-and-procedures.aspx

4.5.4 Gap Identification

Gap 1: Additional information is needed as to the charts and other navigational guidance that boaters use in the Project Study Area to understand the current restrictions that boaters experience and any changes that could happen with the RESA Alternatives. Restrictions associated with lakefill at the entrance to the Western Channel could include:

- Increased current velocities in the entrance to the Western Channel; and,
- Increased wave height because of the western RESA lakefill revetment slope.

4.5.5 Recommendations

Two studies were reviewed for information regarding marine navigation about the Billy Bishop Toronto City Airport. Based on the results of the Gap Analysis, it is recommended that the navigational chart CHS 2085 is obtained to understand the navigational guidance and restrictions that boaters in the area already encounter. The next phase of this study will assess the effects of the RESA expansion on the maneuverability of recreational and commercial vessels at the Western Channel entrance by calculating the reduction of the area at entrance width by the lakefill and considering the influence of lakefill revetment stone on wave reflection and diffraction.

4.6 Air Quality

4.6.1 Overview of Completed Studies

The following studies were reviewed for this gap analysis:

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM 2017 (Appendix C-1: Air Quality Effects Assessment, Air Quality Assessment Report, RWDI Air Inc., 2017):**

  RWDI Air Inc. completed an Air Quality Assessment for the Billy Bishop Toronto City Airport as part of the Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport – Environmental Study Report (AECOM, 2017). The 2017 Air Quality Assessment included the following key activities:

  - Aircraft operations (landings, take-offs, taxiing, and idling);
  - Ground support equipment movements including aircraft refuelling;
  - Ferry crossings; and,
  - Passenger pick-up, drop-off, and vehicle parking operations.

The proposed expansion at Billy Bishop Toronto City Airport included:

- Increase in the number of flight passengers and the associated airport activity;
- Introduction of the commercial CS100 jet aircraft; and,
- Extension of the existing runway by 200m on each end.

The 2017 Air Quality Assessment was completed in accordance with the Ontario Ministry of Transportation's guidance for assessing air quality associated with transportation projects in Ontario.

Three scenarios were modelled to determine the impact from the Project: Current Condition (2012), Future Build Condition (with expansion in place, 2032) and Future No-Build (without expansion in place, 2032).

Contaminants that were included in the modelling assessment are as follows:

- Nitrogen dioxide;
- Carbon monoxide;
- $PM_{2.5}$;
- Acrolein;
- Benzene;
- Cadmium; and,
- Benzo(a)Pyrene (BaP).

The greenhouse gas emissions within the AECOM 2017 Environmental Assessment study area were also estimated for the three scenarios.

The general background air quality conditions were determined for each of the modelled contaminants using historical data collected at local air monitoring stations in the Toronto area. These local air monitoring stations were operated by the Ministry of Environment Conservation, and Parks, National Air Pollution Surveillance program and Metrolinx.

The emission inventory was developed for the significant sources of on-site emissions. The following sources and the emission data source is identified below:

- Aircraft and Ground Support Equipment – Estimates were prepared using an . Engineered Materials Arresting System is a combined emissions and dispersion model for civilian airports and military airbases that was developed by the Federal Aviation Administration. Emission rates for Cadmium and Benzo(a)pyrene were determined using a database available from United States Environmental Protection Agency, known as SPECIATE (version 4.4);

- Motor Vehicles and Road Dust – Estimates for vehicle emissions were prepared using United States Environmental Protection Agency model MOVES. Road dust emissions were calculated using emission factors from United States Environmental Protection Agency, AP-42, Chapter 13.2.1; and,
- Ferry Crossings – Estimates from the operation of the ferries were calculated based on Canadian marine emission standards, engine size and the number of ferries based on the ferry schedules.

CALPUFF dispersion model was selected to model the emissions from the Project's air emission sources. CALPUFF is an advanced dispersion model which simulates transport and dispersion of air contaminants using a three-dimensional, non-steady state model that accounts for the effects of time and space within the meteorological conditions. This model also accounts for the change in wind, air temperature and other parameters due to the location of the Project near the shoreline of Lake Ontario.

The dispersion model predicted the maximum Point of Impingement concentration at the identified sensitive receptors for each of the modelled contaminants. The total cumulative impact at the receptor was determined by adding the background concentration to each of the modelled maximum Point of Impingement concentration for each respective averaging period.

- **Campus-Community Partnership to Characterize Air Pollution in a Neighbourhood Impacted by Major Transportation Infrastructure, Report 1 University of Toronto, 2024:**

  The University of Toronto summarized the findings from a three-year study in the waterfront Bathurst Quay Neighbourhood which is located near the Billy Bishop Toronto City Airport and the Gardiner Expressway. Citizen scientists placed low-cost sensors on outdoor balconies and inside homes for 19 weeks between the years 2020 and 2022 to measure particulate matter with diameters between 0.5 and 2.5 microns.

- **Aircraft Activities and Ultrafine Particle Exposures near a City Airport: Insights from a Measurement Campaign in Toronto, Report 2, University of Toronto. 2024:**

  Report 2 is a continuation of the University of Toronto's assessment from Report 1 and provided more details on the relationship between aircraft operations, meteorological conditions, and ultrafine particles near airports.

4.6.2 Summary of Findings from Technical Studies

The previous Air Quality Assessment prepared by RWDI assessed the air contaminants and quantified the greenhouse gas emissions from operational phase of the proposed runway expansion for the Current, Future Build and Future No Build Conditions. The net effects from the construction phase were discussed in Section 4.1.3.1 on the AECOM 2017 Environmental Assessment, and they were anticipated to be similar for both scenarios. The results from the RWDI 2017 Air Quality Assessment presented the following findings:

- Concentrations of most air contaminants were predicted to remain the same (less than a 1% increase or decrease) across the AECOM 2017 Environmental Assessment study area due to the proposed runway expansion. The main sources which affect the receptors were public roadways and ferry traffic which were not expected to experience a significant change in activity level with the proposed runway expansion;
- Concentrations of some air contaminants for some averaging times exceeded their respective Toxic Reference Values in the AECOM 2017 Environmental Assessment study area. These include the annual values for nitrogen dioxide, $PM_{2.5}$ and Benzo(a)pyrene; 24-hour and annual values for Acrolein. The background levels of Benzo(a)pyrene and Acrolein exceeded the Toxic Reference Values, without the contribution of the proposed runway expansion. The modelled contaminant concentrations from the proposed runway expansion were not expected to alter the number of locations where contaminant levels are predicted to exceed the Toxic Reference Values, nor the magnitude of any exceedance. There were a few receptor locations in close proximity to the Billy Bishop Toronto City Airport where the annual Benzo(a)pyrene and 24-hour Acrolein concentrations were predicted to increase between 2% to 10%;
- A small increase in the potential for odour was anticipated due to the higher fuel amounts associated with the proposed jet engines. The jet engines will provide more complete combustion of the odourous hydrocarbons in the fuel, but the higher volumes will result in an overall net increase for odour detection; and,
- The overall potential for soot impacts was expected to remain the same for the proposed runway expansion.

The University of Toronto's 2024 (Report 1) study conclusions found evidence that regional $PM_{2.5}$ pollution and some spikes from local sources from aircraft takeoff and landings contribute to ambient fine particulate matter levels in the community.

The findings of the University of Toronto's 2024 (Report 2) study stated that ultrafine particles levels measured at the Bathurst Quay neighbourhood were roughly similar to those typical of many other locations across Toronto and other cities around the world. However, the report did suggest that the airport related activities were expected to be a major source of ultrafine particles measured at the Bathurst Quay neighbourhood, with ultrafine particles levels measured at other Toronto locations expected to be influenced by other road traffic-related sources. Short durations of ultrafine particles elevated concentrations were also noted at the monitors located in the Bathurst Quay neighbourhood, which suggests these short-lived spikes are from aircraft takeoff and landings, in comparison to steady state ultrafine particles concentrations measured at other locations due to continuous road-traffic.

4.6.3 Compliance and Governance Requirements

In Ontario, construction impacts to air quality are expected to be managed using an air quality management plan which outlines the best practices, daily monitoring and mitigation measures to prevent the release of dust, odour and other emissions associated with construction vehicles and activities. Measured ambient air quality concentrations are compared to the Ontario Ambient Air Quality Criteria and the Canadian Ambient Air Quality Standards.

Operational impacts are considered in the Environmental Assessment for the Current, Future Build and Future No Build Conditions and would include the contribution from the background level concentrations, in addition to the air emissions from the proposed sources. For the Project, there are no identified changes in the proposed air emission sources (e.g., volume of aircraft, type of aircraft) from the previous Environmental Assessment (AECOM, 2017).

4.6.4 Gap Identification

Gap 1: Ambient air monitoring data were used to provide the general background concentrations in the 2017 Air Quality Assessment. These historical data were collected from air monitoring stations within the Toronto area over the years from 2009 to 2014 and may now be outdated. The study conducted for the Bathurst Quay Neighbourhood (University of Toronto, 2024) did provide some updated measurements only for particulate with diameters of 0.5 to 2.5 microns using low-cost sensors for 19 weeks from 2020 to 2022.

Gap 2: A total of 50 receptors were identified within the AECOM 2017 Environmental Assessment Study Area in the AECOM 2017 Environmental Assessment. These receptors included residential, parks, schools, and other locations of concern. With ongoing development, it's possible that new receptors have been added since the 2017 study.

Gap 3: The 2017 Air Quality Assessment used the most recently available values for the Ontario Ambient Air Quality criteria, Federal Government Canadian Ambient Air Quality Standards and the Toronto Public Health Toxic Reference Values for the contaminant thresholds and risk factors. Due to the date of the previous report, some of the values may have changed, and need to be updated.

Gap 4: A quantitative review of the emissions and potential impacts from the construction phase from the 2017 Air Quality Assessment is a potential gap when assessing the proposed RESA. The net effects from the construction phase were discussed in the 2017 Air Quality Assessment , and they were anticipated to be similar for both scenarios. Potential effects were expected to be short-term, infrequent and highly localized but there were no emission rates, source inventory or dispersion modelling results in the Air Quality Assessment for the construction phase.

4.6.5 Recommendations

Due to the date of the previous study, it is recommended that:

- More recent air monitoring data for the criteria air contaminants be reviewed in future air quality assessments. This includes checking for changes in monitoring station locations and evaluating if there has been an increase in background concentrations for any identified contaminants when assessing the potential air quality impacts of the proposed RESA;
- The current land use within close proximity to the proposed RESA be reviewed to identify any new receptors that should be considered in future air quality assessments; and,
- The most recent versions of the Ontario Ambient Air Quality criteria, Federal Government Canadian Ambient Air Quality Standards, and Toronto Public Health Toxic Reference Values for contaminant thresholds and risk factors be reviewed to confirm if any values have been modified when assessing the potential air quality impacts of the proposed RESA.

Upon selection of the preferred alternative for the proposed RESA, it is recommended to review the potential for air quality impacts from the construction phase of the proposed RESA in a Construction Phase Air Quality Assessment. The following inputs will be required:

- List of construction stages, duration and activities;
- Layout plans indicating work areas for all stages of construction;

- Number and type of construction equipment (by stage) or approval of assumptions; and,
- Duration of each stage.

An emission inventory for the construction phase of the preferred alternative is recommended for the contaminants of concern and the greenhouse gases using the provided details. Dispersion modelling using an advanced air dispersion model (AERMOD) is recommended to determine the maximum point of impingement concentrations at the identified receptors, for each significant contaminant of concern. These results could be used to compare to the applicable contaminant thresholds and risk factors to determine if additional mitigation measures may be required.

Additionally, a qualitative review of all alternatives for the proposed RESA is recommended. The RESAs 2 and 3 consider several ancillary airfield improvements, which could positively impact air quality within the AECOM 2017 Environmental Assessment Study Area:

- New Taxiway B alignment eliminates the need for Taxiway A (eliminate turns); and,
- Taxiway D will be relocated to provide proper separation from Runway.

These improvements are expected to reduce the taxi distance and taxi times and as a result, reduce air emissions during operational phase.

4.7 Noise

4.7.1 Overview of Completed Studies

The following studies were reviewed for this gap analysis:

- **Noise Barriers and Engine Ground Run-Up Enclosure Environmental Screening Report, Dillon Consulting, 2011:**
  A noise study was completed by Dillon Consulting Limited in 2011 for the potential noise barriers and a ground run-up enclosure.
- **Health Impact Assessment for Proposed Expansion to Billy Bishop Toronto City Airport, Golder Associates 2013:**
  A health impact assessment was completed by Golder Associates for the potential expansion of the airport to accommodate jet aircraft. This assessment included an assessment of noise with respect to various general noise metrics for annoyance, and sleep disturbance, not specific to aircraft noise.

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017 (Appendix C-2: Environmental Noise Report, RWDI Air Inc., 2016):**
  A Noise Effects Assessment Study was prepared by RWDI Consulting Engineers and Scientists Incorporated in November 2016 in support of the AECOM 2017 Environmental Assessment for introduction of Jets.
- **PortsToronto Background Noise Monitoring Plan, R.J. Burnside & Associates Limited, 2019:**
  A background noise monitoring plan was prepared by R.J. Burnside and Associates Limited in 2019 to prepare an acoustic assessment for the ground noise emissions from the Billy Bishop Toronto City Airport airport and their corresponding impact on the residential neighbourhood generally north of the airport. However, it appears that this work plan was not executed, and no monitoring results are available.
- **2019 Noise Exposure Contours, Billy Bishop Toronto City Airport. Prepared for Transport Canada. SNC-Lavalin GEM Quebec Inc, 2022:**
  A noise analysis was completed in 2022 by SNC Lavalin which evaluated the Noise Exposure Forecasts for the year 2019 against established metrics.

4.7.2 Summary of Findings from Technical Studies

The Dillon 2011 Noise Barriers and Engine Ground Run-Up Enclosure study reviewed the potential performance of a noise barrier adjacent to the north end of runway 15/33, on the east side of the terminal building, and a separate ground run-up enclosure. The report concluded that the reviewed noise barriers and ground run-up enclosure would result in a noticeable reduction in noise for taxiing and ground run-up operations.

The 2013 Golder Associates report assessed noise with respect to potential human health effects and included predicted overall noise level for three different scenarios, base case with no airport, existing (2013) airport operations, and future overall noise with jet operations. The report adopted criteria for the assessment of human health effects, not regulatory limits. The report concluded that the existing noise levels without the airport are already above the adopted thresholds for annoyance and human health effects. The existing airport operations would add to the overall noise levels, and that jets would not likely add to the noise levels and could potentially decrease the percentage of highly annoyed persons.

The 2016 RWDI report for the Billy Bishop Toronto City Airport assessed noise for several different scenarios. The following is a summary of the scenarios assessed and their general results:

- **Airborne aircraft:**
  - The predicted Noise Exposure Forecasts at the receptor locations would be below the Ministry of Environment Conservation, and Parks' Noise Exposure Forecasts limits; and,
  - The cumulative Effective Perceived Noise[1] decibel will meet applicable limits.
- **Aircraft on ground and ferry:**
  - Noise levels due to existing operations (aircraft on the ground, and the ferry) were predicted to be above the base traffic noise limits for new noise sensitive developments in Ministry of Environment Conservation, and Parks guideline NPC 300, indicating that new noise sensitive developments would likely require warning clauses and potential mitigation measures.
- **Ground support (terminal equipment, aircraft support):**
  - Predicted operational noise levels were below the stationary noise limits in Ministry of Environment Conservation, and Parks guideline NPC 300; and,
  - Guideline noise limits were adjusted upwards using traffic (road) noise predictions in accordance with Ministry of Environment Conservation, and Parks practices.
- **Road and Light Rail Transit:**
  - Existing road and rail noise levels were predicted to be above the base traffic noise limits for new noise sensitive developments in Ministry of Environment Conservation, and Parks guideline NPC 300, indicating that new noise sensitive developments would likely require warning clauses and potential mitigation measures.
- **Cumulative:**
  - Cumulative noise was reviewed and the RWDI report concluded that the AECOM 2017 Environmental Assessment undertaking would not significantly affect the noise levels at nearby noise sensitive receptors,

1. A single number unit of measure that incorporates human annoyance to sound from aircraft, including tones and duration.

and there would be a potential decrease in noise levels due to the introduction of a ground run-up enclosure. Note that the ground run-up enclosure was not part of the base case in the RWDI report.

- **Barrier (along taxiways):**
  - The RWDI report concluded that barriers along the taxiways would have a limited effect on average noise levels due to noise from the ground run-up enclosure. However, the apparent noise reduction provided by taxiway barriers would be higher than shown, during periods where the ground run-up enclosure is not in use.

The 2022 SNC Lavalin report evaluated the 2019 aircraft operations and predicted the Noise Exposure Forecasts curves for the 2019 operations with and without helicopters. The report concluded that the aircraft operations exceeded the established criteria slightly in the northwest quadrant with the operation of helicopters. However, the aircraft operations met the established criteria without helicopter operations. The report was completed during the COVID-19 pandemic and noted that measures will be required to address the overage with helicopter operations, however, this can be delayed due to lower airport operations during the pandemic.

4.7.3 Compliance and Governance Requirements

The most significant noise and vibration effects of the RESAs and possible taxiway reconfiguration will be the temporary construction related effects, the possible change in aircraft taxiing noise (depending on the preferred alternative), and the possible change in approach path (also depending on the preferred alternative).

Construction noise in the Province of Ontario can fall under several jurisdictions. The City of Toronto limits the hours of construction using their noise by-law. However, this by-law exempts government work (work conducted by the City of Toronto, the Province of Ontario, the Government of Canada, and any of its agencies or agents), which includes this Project.

Construction vibration in the City of Toronto is regulated using by-law 514-2008 for construction requiring a building permit. However, if this construction does not require a building permit from the City, then this by-law does not apply. Nonetheless, following the provisions of the by-law would be a good practice.

Provincially, the Ministry of Environment Conservation, and Parks is the regulatory body responsible for noise and vibration. This ministry does not have receptor-based noise limits for construction noise. However, it does have equipment noise emissions

standards as documented in NPC 115 and NPC 118. The ministry has vibration limits for blasting; however, blasting is not anticipated to take place for this Project.

Airborne aircraft noise is typically regulated with Noise Exposure Forecasts limits established by Transport Canada. However, the Billy Bishop Toronto City Airport has separate criteria as described in the Tripartite agreement which limits the future 28 Noise Exposure Forecasts contour to the 1990 25 Noise Exposure Forecasts contour.

4.7.4 Gap Identification

Gap 1: Environmental Assessments in the Province of Ontario typically require the assessment of construction noise and vibration. Construction noise and vibration have not been previously assessed.

Gap 2: Relocation of the taxiways B and D have the potential to affect the perceived noise from the Billy Bishop Toronto City Airport. These potential modifications have not been numerically evaluated.

Gap 3: The potential relocation of the localizer can have an effect on the airborne aircraft noise. This has not been evaluated.

4.7.5 Recommendations

Once the preferred alternative design is selected, gather the needed information to conduct a construction noise and vibration assessment as input into the overall Environmental Assessment Study Report. The following information would be required:

- List of construction stages and activities;
- Layout plans indicating work areas for all stages of construction;
- List of construction equipment (by stage) or approval of assumptions; and,
- If there are any client specific construction noise and vibration criteria to be used.

Various potential alternatives suggest a potential to relocate taxiways B and D. The potential relocation of the taxiways would have an effect on the long-term noise emissions from the Billy Bishop Toronto City Airport.

Previous studies have indicated that taxiway barriers would have a limited effect on the metrics evaluated due to the operations of the ground run-up enclosure (controlling source of noise). To evaluate the potential perceived noise impact of taxiway relocations, and potential taxiway noise barriers (depending on the alternative), the analysis should

concentrate on the difference in noise contributions of the taxiways being relocated. The evaluation of the noise contributions from these taxiways will require:

- Footprint and height of the noise barriers in the alternative;
- Footprint and heights of airport structures (such as the terminal buildings, hangars, and existing noise barriers); and
- Confirmation of aircraft volumes/quantities and types (or if the information in one of the previous study reports is to be used).

RESAs 2 and 3 suggest the potential to relocate the localizer at the west end of Runway 26. This will correspondingly affect the approach path (from the east) of some aircraft during adverse weather conditions. The effects of this should be evaluated against the established Noise Exposure Forecasts from the 2022 SNC Lavalin Report. To evaluate the aircraft noise change, the following information will be required:

- Confirmation of inputs into the Noise Exposure Forecasts predictions for the base case;
- Confirmation of the air traffic volumes and types to be used;
- Co-ordinates of the original flight paths and the adjusted flight paths; and,
- Information about distribution of aircraft on each flight path for the preferred alternative.

4.8 Built Form and Land Use

4.8.1 Overview of Completed Studies

The following study was reviewed for this gap analysis:

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, 2017 (Appendix C-7: Built Form and Land Use Effects Assessment, SvN Architects and Planners, 2017):**
  A Built Form and Land Use Effects Assessment was prepared and submitted by SvN Architects and Planners in June 2017 for the Billy Bishop Toronto City Airport as part of the Environmental Assessment of the Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport. The SvN report was focused on reviewing compatibility concerns between airport expansion and planned development within the vicinity of the airport and potential adverse impacts on the residential and recreational environments.

4.8.2 Summary of Findings from Technical Studies

The report highlighted three types of potential compatibility issues warranting further investigation and requiring the development of mitigation measures, should an airport expansion plan move further in the planning stages. The top three potential compatibility issues identified in this report are:

- Issue #1: Planning areas that fall under the Airport Zoning Regulations area or the Missed Approach Surface (MAS)[1] and for which no maximum building heights have been identified yet;
- Issue #2: Planning areas that feature a maximum building height that exceeds that of the current controlling obstacle; and
- Issue #3: Planning Areas that contain sensitive land uses above the projected Noise Exposure Forecasts 25 contour.

The report identified potential compatibility concerns that fall within issue #1 above, for the following planning areas:

- The Port Lands Planning Framework;
- The Villiers Island Precinct Plan;
- The Bathurst Quay Neighbourhood Plan; and,
- The Ontario Place Revitalization Plan.

For issue #2 identified above, the report found potential concerns for the following planning areas:

- The East Bayfront Precinct Plan;
- The Lower Yonge Precinct Plan; and,
- The Fort York Secondary Plan.

For issue #3 identified above, the report has found potential concerns for the following planning areas:

- The Ontario Place Revitalization Plan.

1. The Missed Approach Surface (MAS) is a defined three-dimensional imaginary surface extending outward and upward from the runway threshold, characterized by specific geometric dimensions and slopes. It ensures that an aircraft can safely climb and maneuver during a missed approach without encountering obstacles or terrain hazards.

4.8.3 Compliance and Governance Requirements

The Toronto Island Airport Zoning Regulations (SOR/85-515):
Established in 1985, Toronto Island Airport Zoning Regulations enforce restrictions for Billy Bishop Toronto City Airport. These regulations stipulate that no construction may surpass specified elevation limits on any land within defined approach, outer, or transitional surfaces of the airport. According to Avia NG, no changes will be expected to the airspace, and no impacts to the Toronto Island Airport Zoning Regulations are anticipated.

The 2023 Consolidated Version of the City of Toronto's Official Plan:
While its general policies do not specifically mention the Billy Bishop Toronto City Airport , they acknowledge airports as vital transportation hubs essential for the city's competitiveness and infrastructure. Specific to the Billy Bishop Toronto City Airport, Site and Area Specific Policy #194 stipulates that airport operations are permissible under compliance with the Tripartite Agreement. The policy supports ongoing aviation use of the Billy Bishop Toronto City Airport's lands and safeguards existing flight paths, ensuring any modifications to facilities do not harm the surrounding environment. Regarding land use policy, all Billy Bishop Toronto City Airport facilities on the Islands and Eireann Quay are designated as Parks or Natural Areas in the Official Plan. The remainder of the areas in the vicinity of the Project Study Area encompasses various land use policy zones, including Apartment Neighbourhoods, Mixed Use Areas, and Regeneration Areas.

The Central Waterfront Secondary Plan (OPA 257):
The Central Waterfront Secondary Plan advocates for prioritizing transit and active transportation over car usage. It emphasizes the importance of completing trail systems and preserving the waterfront for public access. This vision is reinforced by plans to develop new public spaces along the dock wall.

4.8.4 Gap Identification

Gap 1: While there is no dedicated framework aligning City and the Billy Bishop Toronto City Airport planning efforts, a structured hierarchy of plans and documents exists to guide development around airports in general, including specific directives for the Project Study Area. These documents span various levels, from provincial to neighbourhood scales. While some directly mention the Billy Bishop Toronto City Airport, most do not. In the past seven years since the previous Land Use and Built Form Analysis, there have been changes in the development plans for these lands that may need to be further reviewed and assessed for compatibility.

4.8.5 Recommendations

For a thorough review and update, we propose the following:

- Review and update of the Policy, Regulatory and Planning Tool Framework;
- Review of the planned and approved built form and land use in the Project Study Area;
- Confirm the compatibility of the Project with the applicable planning policies and regulations;
- It is understood that the proposed RESA alternatives and all associated new infrastructure will respect the existing Obstacle Limitation Surfaces and Obstacle Protection Surfaces and will not change their level of protection or geometrics (Avia NG, 2024). According to Avia NG, no changes will be expected to the airspace, and no impacts to the Toronto Island Airport Zoning Regulations are anticipated. Therefore, the compatibility of the Project with respect to Obstacle Limitation Surface, OPS and Airport Zoning Regulations surfaces will not be reviewed further; and,
- The potential effects of changes to the flight path due to relocation of the localizer 26 on the Noise Exposure Forecasts contours will be modelled as part of the Noise Assessment study.

Once the updates are completed, the proposed RESA alternatives will be reviewed against these to assist in selecting the preferred alternative design.

Once the preferred alternative design is selected, additional information may need to be gathered to further refine the built form and land use compatibility assessment as input into the overall Environmental Assessment Study Report.

4.9 Traffic and Transportation

4.9.1 Overview of Completed Studies

The AECOM Traffic Engineering team has reviewed background studies to identify any data gaps in order to complete the RESA Environmental Assessment, and to determine whether additional traffic data collection and analysis tasks are required. As part of the gap analysis, the following relevant background reports were reviewed:

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017 (Appendix C-11: Transportation Net Effects Assessment. AECOM. 2016):**
  The 2016 Transportation Net Effects Assessment study (AECOM 2016 study) undertaken by AECOM assessed base case (existing at the time) traffic, parking, transit and active transportation conditions, as well as future conditions with the anticipated increase in trips to and from the airport as a result of the proposed (at the time) changes, mainly due to the anticipated changes in future passenger activity levels.
- **2018 Airport Master Plan, Billy Bishop Toronto City Airport, 2018:**
  The 2018 Airport Master Plan provided an update on completed and planned changes to the passenger and vehicular traffic operations around the Billy Bishop Toronto City Airport and set a list of recommendations. The 2018 Master Plan identified priorities for the airport, which included improvements to operational efficiency of the airside to minimize delays and reduce ground noise, as well as improvements to operational efficiency with respect to landside curb activities, and to encourage greater use of the airport shuttle and public transit.
- **Billy Bishop Toronto City Airport – Results of Fall 2015 Traffic and Passenger Surveys, Dillon, 2016:**
  The October 2015 Traffic and Passenger surveys were undertaken as a follow-up to the surveys undertaken in April 2015 to provide a comparison in operating conditions before and after the opening of the pedestrian tunnel.

4.9.2 Summary of Findings from Technical Studies

The AECOM 2016 study identified areas with operational concerns under both the future baseline scenario and the proposed future scenario (increased passenger activity level), that saw an increase in the total number of passengers, as illustrated in Table 4-3 below.

Table 4-3: Future Conditions Passenger Activity Levels

	Future Baseline Scenario	Proposed Future Scenario
Flights / hour	24	24
Includes jets?	No	Yes
Passengers / hour (total)	1,447	1,741
Connecting passengers	362	435
Mainland passengers	1,085	1,306
Arriving passengers	543	653
Departing passengers	542	653

Source: AECOM, 2016.

The AECOM 2016 study area included six key intersections that were expected to be affected by the airport traffic, and the analysis showed numerous critical movements at the subject intersections, especially in the afternoon peak hour. It should be noted that the operational assessment was based on traffic volumes obtained through a series of traffic surveys undertaken in April 2015, which pre-dates the opening of the pedestrian tunnel, which became operational in July of the same year.

With respect to parking requirements, the study concluded that parking demand would increase from 109 parking spaces under the future baseline scenario to 131 parking spaces at the estimated 10% parking mode share.

With respect to active transportation, it was concluded that *"if active transportation mode shares stay constant at approximately 8% and 15% in AM and PM peak hours, transit ridership, cycling and pedestrian volumes will increase by up to 20% between the Future Baseline and Proposed Future Total Scenarios. If unmitigated by additional transit services or improved cycling and pedestrian infrastructure, this increase can cause overcrowding, poor service, and potential safety hazards".* As noted earlier, the traffic data used in the AECOM 2016 study does not reflect the presence of the pedestrian tunnel to the Billy Bishop Toronto City Airport as it was opened after the noted traffic surveys.

The 2018 Airport Master Plan identified the following areas as part of the Airport Development Plan:

- Modest enhancements to the taxiway system to make the ground movements of aircraft more efficient, potentially reducing both ground noise and emissions;

- Making provision for a new Combined Services Building north of Runway 08/26, and new equipment storage building in the south field;
- Providing additional apron, tie-down and hangar areas for general aviation north of Runway 08/26 and in the south field;
- In collaboration with the City of Toronto, exploring initiatives to provide the means for commercial vehicles to access the airport and Toronto Islands for the City of Toronto from Hanlan's Point ferry docks; and,
- Restoration and relocation of the historic Terminal A building to a new location which could repurpose the building for aviation use into the future.

And finally, the 2015 traffic surveys identified the changes in traffic patterns following the opening of the tunnel. Before the tunnel opening, passengers would arrive on the mainland in large groups causing surges in traffic demand at the mainline terminal and some of the adjacent roadways. With the tunnel in place, the arrival of passengers onto the mainland is more dispersed, resulting in reduced surges in traffic demand. The following effects were noted:

- Smoothing out of the peaks in traffic flow, queuing and congestion on Eireann Quay that were previously experienced following the arrival of a ferry;
- More frequent and more gradual turnover of taxis queued in the corral (rather than in extended build-up period followed by a brief surge of outbound taxis);
- A reduction in the number of deadheading taxis during the afternoon; and,
- More even distribution of ridership on shuttle trips leaving the airport.

4.9.3 Compliance and Governance Requirements

Construction Traffic Management:
While the RESAs are not anticipated to have a long-term impact on traffic patterns, notable traffic disruptions are expected during the temporary conditions (construction phase). Measures will be implemented to manage construction traffic effectively, minimizing disruptions to existing traffic flows. Adherence to the City of Toronto's traffic by-laws will be essential to ensure that construction activities do not unduly affect the surrounding traffic network.

4.9.4 Gap Identification

Gap 1: The traffic data from 2015 may not accurately reflect the current conditions, necessitating the collection of traffic data to capture recent changes in urban development and transportation patterns. Since the AECOM 2016 study was completed

prior to the completion of the pedestrian tunnel, the analysis outcome for both future baseline and proposed future scenarios does not reflect changes to travel patterns due to the tunnel.

4.9.5 Recommendations

The future proposed scenario considered in the AECOM 2016 study was based on the assumed increase in passenger activity level. Implementation of RESA improvements is not expected to result in an increase in the passenger activity level. Given that there will be no increase in the passenger activity level, the impact to the adjacent mainland intersections identified as part of the AECOM 2016 study analysis can be considered conservative, especially in light of the fact that the effects of the pedestrian tunnel on vehicular traffic had not been considered as the pedestrian tunnel was not operational at that time. The pedestrian tunnel is likely to further reduce vehicular trips made to and from the airport. Therefore, no update to the Traffic and Transportation data are recommended for evaluating the RESA alternatives.

4.10 Archaeology

4.10.1 Overview of Completed Studies

The following studies were reviewed for this gap analysis:

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017 (Appendix C-8: Archaeology and Cultural Heritage Effects Assessment).**
  - **Stage 1 Archaeological Assessment (P438-0011-2014), AECOM, 2015.**
    A Stage 1 Terrestrial Archaeological Assessment was completed by AECOM in 2015 (PIF P438-0011-2014) for the proposed extension of the landmass at each end of the main runway of the Billy Bishop Toronto City Airport by 200 m.
  - **Stage 1 Marine Archaeological Assessment, AECOM, 2017:**
    A Stage 1 Marine Archaeological Assessment was completed by AECOM in 2017 for the proposed extension of the landmass at each end of the main runway of the Billy Bishop Toronto City Airport by 200 m.

4.10.2 Summary of Findings from Technical Studies

The Stage 1 Terrestrial Archaeological Assessment completed by AECOM in 2015 (PIF P438-0011-2014) identified that the proposed landmass extensions will impact part of Toronto Island that was created in the 1930s. Additionally, the areas identified as retaining archaeological potential that exist within the AECOM 2017 Environmental Assessment study area are currently located under existing airport runways and tarmac and do not retain any archaeological potential. Therefore, the 2017 Environmental Assessment study area lands above water do not retain any potential for archaeological resources and no further Archaeological Assessment is recommended.

The background research conducted as part of the Stage 1 Marine Archaeological Assessment indicated that lakefill has proved to conceal known archaeological resources resting at the bottom of the harbour. Known shipwrecks are present under the extension of the Toronto Islands and potentially within the lakefill under the Billy Bishop Toronto City Airport property (e.g., Toronto Yacht).

In terms of marine archaeology, the Archaeological Master Plan for the Central Waterfront (City of Toronto, 2003) is erroneous when it concludes that lakefill does not have archaeological potential (City of Toronto, 2003). While land based archaeological sites will not be present on the artificially constructed land, under the water, the lakefill and other sediment could be preserving marine archaeological resources. Sedimentation of the bottom at the areas of proposed landmass extensions is suitable for preserving and covering such underwater resources. Archaeological potential is removed in areas where the lakebed has been dredged; however, the archaeological potential is judged to be high for marine archaeological resources in all other areas as significant marine archaeological resources could be present and obscured by sediment.

It was recommended by AECOM (2017) that a Stage 2 Archaeological Assessment survey of the projected lakefill area and its 100m buffer zone be performed with a sub-bottom profiler and an underwater magnetometer. This should determine if any archaeological resources, particularly shipwrecks, are present under the existing lakebed. If the result of the survey proves that no cultural resources are present, lake filling can be executed as projected. If anomalies are present, a visual confirmation of the resources is to be executed through direct diving or by remotely operated vehicle equipped with an underwater camera. If the cultural remains are buried within the lakebed, an underwater excavation is to be completed in order to visually confirm and identify the presence of cultural remains. Only after a proper validation can appropriate protective measures be proposed.

4.10.3 Compliance and Governance Requirements

4.10.3.1 Terrestrial Archaeology:

The Stage 1 Archaeological Assessment report was completed following the *Standards and Guidelines for Consultant Archaeologists* and submitted to the Ontario Minister of Citizenship and Multiculturalism as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The Ministry issued a letter on April 12, 2016 indicating their concurrence with the recommendations provided.

4.10.3.2 Marine Archaeology:

The Stage 1 Marine Archaeological Assessment report was completed and submitted to the Ontario Minister of Citizenship and Multiculturalism as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18.

4.10.4 Gap Identification

4.10.4.1 Terrestrial Archaeology:

Gap 1: The AECOM 2017 Environmental Assessment study area was compared to the landmass to be extended on both ends to accommodate the RESA. Currently, there are three alternatives presented, including RESAs 1 through 3. The study area difference is illustrated in Figure 4-8. Due to the configuration of the RESA 3 footprint, an additional Stage 1 Archaeological Assessment is required for the RESA 3 footprint. The Stage 1 archaeological background study will consist of research which will identify known archaeological sites, areas subject to previous assessments, as well as an evaluation of the potential for archaeological resources to be present in the Project Study Area. It will consider additional areas likely to be disturbed by the proposed work. The Stage 1 Archaeological Assessment report will be written and submitted to the Ministry of Citizenship and Multiculturalism for review and acceptance into the register of archaeological reports and will provide the results of the background study and evaluation of archaeological potential. The report will be concluded with a recommendation on whether Stage 2 Archaeological Assessment is required and what the appropriate Stage 2 assessment strategy should consist of, as well as indicating what areas are cleared of archaeological concerns.

4.10.4.2 Marine Archaeology:

Gap 1: The background research of the underwater portion of the AECOM 2017 Environmental Assessment study area resulted in the identification of several shipwrecks that have been lost in Toronto Harbour and potentially in the vicinity of the

Project Study Area. Based on these findings, there is high potential for the recovery of marine archaeological resources. It is possible that these resources may be impacted by the proposed RESA and mitigation measures are required. It was recommended by AECOM (2017) that an in-water Stage 2 Marine Archaeological Assessment must be completed.

4.10.5 Recommendations

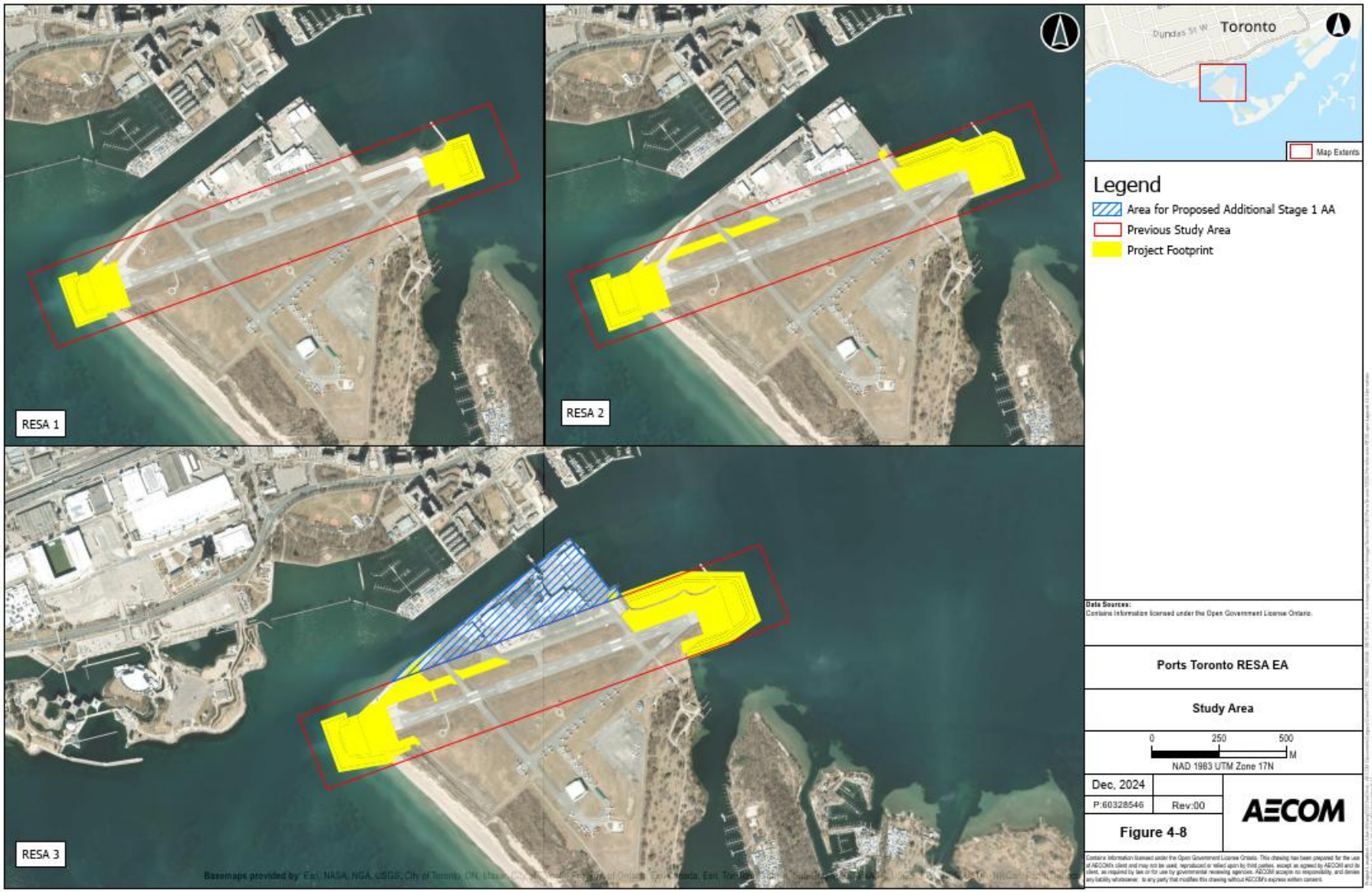
4.10.5.1 Terrestrial Archaeology

An additional Stage 1 Archaeological Assessment is required for a portion of the RESA 3 footprint that extends beyond the area cleared in AECOM's 2017 Archaeology Study.

4.10.5.2 Marine Archaeology

It was recommended by AECOM (2017) that a survey of the projected lakefill area and its 100m buffer zone be performed with a sub-bottom profiler and an underwater magnetometer to confirm presence or absence of archaeological materials on the lakebed. It was also recommended that a qualified underwater archaeologist with scientific competence appropriate to the Project be present at all times during the physical survey as specified in the general principles of the Convention on the Protection of the Underwater Cultural Heritage by the United Nations Educational, Scientific and Cultural Organization (AECOM 2017).

Figure 4-8: Footprint Comparison of RESAs 1 to 3 versus the 2015 Stage 1 Archaeological Assessment Study Area



4.11 Cultural Heritage

4.11.1 Overview of Completed Studies

The following studies were reviewed for this gap analysis:

- **Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport Environmental Study Report, AECOM, 2017 (Appendix C-8: Archaeology and Cultural Heritage Effects Assessment).**
  - **Billy Bishop Toronto City Airport Cultural Heritage Resource Review, AECOM, 2015:**
    In 2015, AECOM prepared a Cultural Heritage Resource Review Memorandum (Cultural Heritage Memo), which was later included in Appendix C-8 of the 2017 Environmental Study Report for PortsToronto. The Cultural Heritage Memo identified one listed built heritage feature: the Ned Hanlan Memorial, and one National Historic Site of Canada—the Toronto Island Airport Terminal Building, located south of the AECOM 2017 Environmental Assessment study area. In addition, 11 historical plaques were identified on the Toronto Islands, three of which were also located adjacent to the AECOM 2017 Environmental Assessment study area, at Hanlan's Point.
- **Heritage Conservation District Study, City of Toronto, 2004:**
  In 2004, City Council passed By-law 952-2004 (Schedule "A" of By-law 952-2004), which recommended that land on Toronto Islands encompassing Ward's Island Park, Algonquin Park, and part of Centre Island be examined for future designation as a heritage conservation district under Part V of the *Ontario Heritage Act*. The Heritage Conservation District study area is located at the opposite end of Toronto Islands from the Billy Bishop Toronto City Airport. As part of the Toronto Island Heritage Conservation District Study that resulted in this by-law, the study recommended that Toronto Island be municipally recognized as a cultural heritage landscape (ERA Architects, 2004).
- **Toronto Island Park Master Plan and Cultural Resource Assessment, City of Toronto, Ongoing:**
  According to the City of Toronto, the Toronto Island Park Master Plan study is currently underway. Led by Lori Ellis, Senior Project Manager in Parks, Forestry & Recreation, it includes a Cultural Heritage Resource Assessment that contains a heritage inventory of all heritage assets within the study area

for the Master Plan. The Toronto Island Master Plan staff report, and Cultural Heritage Resource Assessment contained within, is currently tracking to City Council this summer (AECOM's Communication with the City of Toronto, June 2024).

4.11.2 Summary of Findings from Technical Studies

The identified heritage features in AECOM's 2015 Cultural Heritage Memo are outlined below[11]. The 2015 Cultural Heritage Memo concluded that there were no negative impacts anticipated to the cultural heritage landscape and heritage resources identified in the Memo.

- **Ned Hanlan Memorial:**
  The Ned Hanlan Memorial was listed by Toronto's City Council as a "Miscellaneous" building type with cultural heritage significance, on June 20, 1973. The Memorial is a large statue located near the ferry dock at Hanlan's Point. It was constructed in 1926 and unveiled at the grounds of the Canadian National Exhibition. In 2004, the monument was moved to its current location on Lakeshore Avenue, St. Lawrence-East Bayfront- The Toronto Islands.
- **Toronto Island Airport Terminal Building:**
  The Toronto Island Airport Terminal Building was designated as a National Historic Site of Canada in 1989 as a rare surviving example of air terminal construction from the formative years of air passenger travel. It is also listed on the City of Toronto Heritage Register. It was built in 1938-1939 by the Toronto Harbour Commissioners and is described as a two-storey, wooden aviation terminal with a central control tower. It is one of very few early terminal buildings to have survived and is likely the oldest, extant operating terminal of its time in Canada. Additional cultural heritage information on the airport terminal building and surrounding environment is included in the Environmental Screening Report for the Removal and Relocation of the Airport Administration Building, Billy Bishop Airport (SENES Consultants Limited, 2011), and the Environmental Assessment Report for PortsToronto (formerly the Toronto Port Authority) Billy Bishop Toronto City Airport Lakefill Within Marine Exclusion Zone (Keep-Out-Area) - Toronto Harbour (Dillon Consulting Limited, 2013).

  In addition to its status as a National Historic Site of Canada, the Toronto Island Airport Terminal Building (1 Island Airport) is also listed on the City of

11. The descriptions have been adapted from the AECOM 2015 Memo based on consultation with the City of Toronto on June 24, 2024 (AECOM's Communication with the City of Toronto, June 2024).

Toronto's Heritage Register, which was not noted in the Cultural Heritage Memo. The Memo also stated that the Toronto Island Airport Terminal Building was located on the western end of Toronto Islands on its original footprint. However, in 2012, a new terminal building for Billy Bishop Toronto City Airport was constructed and the original Terminal Building was relocated to the other side of the runways, near the Ned Hanlan monument. As part of the consultation process for the Environmental Screening Report for the relocation of the Terminal Building, the Ministry of Tourism and Culture (now the Ministry of Citizenship and Multiculturalism) recommended a Heritage Impact Assessment, to help identify the cultural heritage value of any individual built heritage resources or cultural heritage landscapes located within or near the SENES 2011 project area (SENES, 2011). Since relocation took place in 2012, it is assumed that this Heritage Impact Assessment was completed, and AECOM will undertake consultation to obtain this report. Plans were announced in 2014 for the restoration and proposed reuse of the former Terminal Building as a restaurant, which has not yet occurred.

- **Historical Plaques:**
  The following is the text of the three commemorative plaques that are located in proximity to the Project Study Area at Hanlan's Point:
  - ***Ned Hanlan 1855-1908 (Ontario Heritage Trust, n.d.)***
    One of Canada's greatest oarsmen, Edward Hanlan was born in Toronto. As a child he took up rowing when his family settled in this vicinity, now named Hanlan's Point. Although standing only 175 cm and rarely heavier than 68 kg, he became a leading international sculler. In 1873 Hanlan won the amateur rowing championship of Toronto Bay. Becoming a professional in 1876, he defeated all opponents in the Philadelphia Races of that year. He overcame all leading North American competitors and in 1880 won the world single sculls championship in England. Hanlan retained his title until 1884. A popular Toronto figure, he was elected Alderman for this area in 1898 and 1899.
  - ***Babe Ruth at Hanlan's Point (Heritage Toronto, 2006)***
    Near this site, in Maple Leaf Park on September 5, 1914, the now legendary baseball player Babe Ruth hit his first home run as a professional. It was to be the only home run he ever hit in the minor leagues. As a 19-year-old rookie, playing for the Providence Grays in the International League, he connected with a pitch from Ellis Johnson of the Toronto Maple Leafs, sending the ball over the fence in right field and scoring three runs. Pitching for the Grays, Ruth allowed only

one hit, earning the title "southside phenom" from the Toronto Daily Star. The final score was Providence Grays 9, Toronto Maple Leafs 0. Babe Ruth quickly moved up to the major leagues and played his way to a phenomenal career. The Toronto team went on to win a total of eleven pennants before folding in 1967.

- ***Professional Baseball at Hanlan's Point (Heritage Toronto, 2006)*** In 1867, Toronto's professional baseball club moved to the new Hanlan's Point Stadium - part of the larger Hanlan's Point Amusement Park on this site. Baseball and lacrosse joined other attractions here, including hotels, thrilling amusement rides, and such curiosities as a diving horse. In 1910, the baseball team, now called the Toronto Maple Leafs, replaced its wooden stadium with a concrete, 18,000-seat structure named Maple Leaf Park. The team remained there for the next 15 years, winning pennants for adoring fans in 1912, 1917, and 1918. In 1926, the club was moved to a more accessible, state-of-the-art stadium at the foot of Bathurst Street. The island stadium was eventually demolished, and the site was redeveloped for the Toronto Island Airport.

Based on the City of Toronto's online Heritage Register, which was last updated as of June 2024, no Heritage Conservation District is under study, appeal, or designated on Toronto Islands.

4.11.3 Compliance and Governance Requirements

The authority to request heritage assessments arises from the *Ontario Heritage Act*, Section 2(d) of the Planning Act, the Provincial Policy Statement (2024), and the City of Toronto's Official Plan (Section 3.1.6). The *Ontario Heritage Act* enables designation of properties and districts under Part IV and Part V, Sections 26 through 46 and also provides the legislative bases for applying heritage easements to real property. The Planning Act (1990) and related Provincial Policy Statement (2024) make a number of provisions relating to heritage conservation. One of the general purposes of the Planning Act is to integrate matters of Provincial interest in Provincial and Municipal planning decisions. In order to inform all those involved in planning activities of the scope of these matters of Provincial interest, Section 2 of the Planning Act provides an extensive listing. These matters of Provincial interest shall be regarded when certain authorities, including the council of a Municipality, carry out their responsibilities under the Act. Pursuant to Section 2.6 of the 2024 Provincial Policy Statement, Policy 2.6.1 states "Significant built heritage resources and significant cultural heritage landscapes shall be conserved." The 2024 Provincial Policy Statement issued under the authority of the Planning Act defines "conserved" as "the identification, protection, management and

use of built heritage resources, cultural heritage landscapes and archaeological resources in a manner that ensures their cultural heritage value or interest is retained." Lastly, the City of Toronto Official Plan (dated December 2023) contains policies on heritage conservation and direct the undertaking of heritage reports such as heritage impact assessments. The following polices are relevant to this Project including:

- Chapter 3, Policy 23. Heritage Impact Assessment will evaluate the impact of a proposed alteration to a property on the Heritage Register, and/or to properties adjacent to a property on the Heritage Register, to the satisfaction of the City; and,
- Chapter 3, Policy 26. New construction on, or adjacent to, a property on the Heritage Register will be designed to conserve the cultural heritage values, attributes and character of that property and to mitigate visual and physical impact on it.

4.11.4 Gap Identification

Table 4-4 presents a summary of the cultural heritage resources identified between in the Cultural Heritage Memo (2015) and those located within the Project Study Area, based on a review of available heritage databases to identify resources within or in proximity to the Project Study Area. Since the 2015 Cultural Heritage Memo, Heritage Toronto erected Commemorative Plaques on Toronto Islands for English's Boathouse (2016) and Shipwrecks at Gibraltar Point (2019). However, these plaques are not located in proximity to the Project Study Area.

Gap 1: Three additional cultural heritage resources with addresses on Lakeshore Avenue in the area of Hanlan's Point in proximity to the AECOM 2017 Environmental Assessment study area are noted as gaps to the Cultural Heritage Memo (Table 4-4: Features 2, 4 and 5).

It should be noted that Table 4-4 is based on the review of the Cultural Heritage Memo and the City of Toronto's Heritage Register, which was last updated as of June 2024, for properties in proximity to the AECOM 2017 Environmental Assessment study area that could conceivably experience direct or indirect adverse impacts from the Project. The "Description" column identifying each cultural heritage resource was confirmed by the City of Toronto.

Table 4-4: Gap Analysis of Cultural Heritage Resources in Proximity to the Project Study Area

Feature ID	Location	Description	Source Identification/ Heritage Status	Notes
1	1 Island Airport	Toronto Island Airport Terminal Building (1939)	AECOM, 2015/Listed; National Historic Site of Canada	■ In proximity to the Project Study Area; and, ■ Further heritage reporting may be required (i.e., Heritage Impact Assessment) if there are determined to be adverse direct or indirect impacts.
2	800 Lakeshore Avenue	Ned Hanlan Tugboat (no date)	Consultation with the City of Toronto; recommended in Toronto Island Park Cultural Heritage Resource Assessment for inclusion in a Toronto Island Cultural Heritage Landscape Study/Heritage Potential	■ In proximity to the Project Study Area; ■ Not identified in 2015 Study; and, ■ Further heritage reporting may be required (i.e., Heritage Impact Assessment) if there are determined to be adverse direct or indirect impacts.
3	760 Lakeshore Avenue	Ned Hanlan Memorial (c. 1926)	Consultation with the City of Toronto and review of the Municipal Heritage Register/Listed	■ In proximity to the Project Study Area; and, ■ Further heritage reporting may be required (i.e., Heritage Impact Assessment) if there are determined to be adverse direct or indirect impacts.
4	750 Lakeshore Avenue	Picnic Pavilion & Bathing Station (Hanlan's Ferry Dock, 1964)	Consultation with the City of Toronto; recommended in Toronto Island Park Cultural Heritage Resource Assessment for inclusion in a Toronto Island Modernist Landscape Cultural Heritage Evaluation Reports/Heritage Potential	■ In proximity to the Project Study Area; ■ Not identified in 2015 Study; and, ■ Further heritage reporting may be required (i.e., Heritage Impact Assessment) if there are determined to be adverse direct or indirect impacts.
5	740 Lakeshore Avenue	Picnic Pavilion & Bathing Station (Hanlan's Mooring Wall, 1964)	Consultation with the City of Toronto; recommended in Toronto Island Park Cultural Heritage Resource Assessment for inclusion in a Toronto Island Modernist Landscape Cultural Heritage Evaluation Reports /Heritage Potential	■ In proximity to the Project Study Area; ■ Not identified in 2015 Study; and, ■ Further heritage reporting may be required (i.e., Heritage Impact Assessment) if there are determined to be adverse direct or indirect impacts.

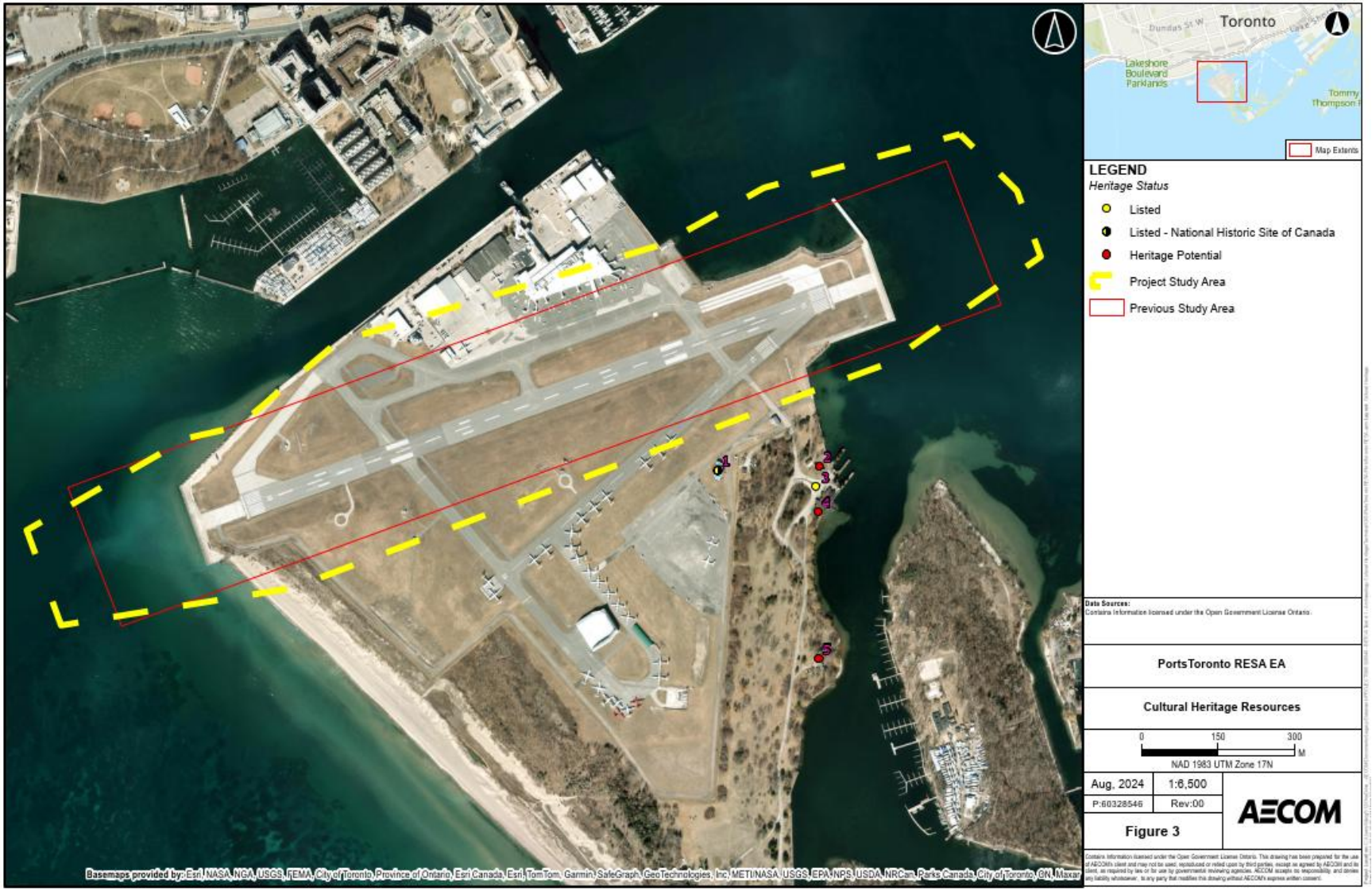
4.11.5 Recommendations

The cultural heritage resources are shown on Figure 4-9. They should be reviewed against the RESA Alternatives for direct and indirect adverse impacts to determine the need for future assessments.

It is recommended that AECOM consult the Cultural Heritage Resource Assessment for the Toronto Island Park Master Plan (currently in progress), to confirm all identified cultural heritage resources within, adjacent to, or in proximity to the Project Study Area. According to the City of Toronto, this Cultural Heritage Resource Assessment contains recommendations for further heritage studies to be conducted, including a full Cultural Heritage Landscape Study and additional Cultural Heritage Evaluation Reports for individual properties or groups of related properties that have been identified through the Cultural Heritage Resource Assessment as potential heritage resources.

Completion of further heritage reporting is recommended, including a Cultural Heritage Resource Assessment for the Project, and Heritage Impact Assessments if there are determined to be adverse direct or indirect impacts to cultural heritage resources.

Figure 4-9: Cultural Heritage Resources



4.12 Groundwater

4.12.1 Overview of Completed Studies

The following study was reviewed for this gap analysis:

- **Geotechnical Investigation Report, Security Fence Replacement, Billy Bishop Toronto City Centre Airport, Toronto, Ontario, GEMTEC, 2023:** GEMTEC conducted a geotechnical investigation for the replacement of the security fence at the Billy Bishop Toronto City Airport. The study characterized the general subsurface conditions along the existing perimeter fence line and provided geotechnical recommendations for the new fence post footings.

4.12.2 Summary of Findings from Technical Studies:

Based on factual data that are presented within the Geotechnical Investigation Report for a series of nine (9) test pits advanced across the southwestern and eastern perimeter of Billy Bishop Toronto City Airport property, the following understanding of local geological and hydrogeological conditions is provided (refer to Figure 4-10 for the location of Test Pits):

- The local native soils are reported (for Test Pit excavation depths ranging from 2.00 metres to 2.12 metres below ground surface) to be comprised of Sand (Oxidized), with Trace to Some Fine (Silt and/or Clay) and Trace Gravel. A thin (0.5 m) layer of Silty Sand with Trace to some Clay and Trace Gravel is reported to occur beneath the surficial topsoil within Test Pit #4 (that is underlain by Sand);
- Groundwater elevations along the southwestern and eastern perimeter of the Billy Bishop Toronto City Airport property are reported to range between approximately 75.0 metres and 75.8 metres above surface level. The depth to groundwater varies amongst the Test Pit locations according to differences in ground elevation. In general, groundwater levels occur at depths ranging from 0.2 to 1.2 metres below ground surface, depending on location and time of year;
- Groundwater elevations upon the Billy Bishop Toronto City Airport property on the dates of measurement by GEMTEC (February 1st, April 1st and April 26th, 2023) are reported to be approximately 200 mm to 800 mm above the level of

Lake Ontario on those same dates, as reported by the *International Lake Ontario-St. Lawrence River Board* (IJC); and,

- Groundwater flow is interpreted to occur radially outward toward the perimeter of the Billy Bishop Toronto City Airport property and the Lake Ontario shoreline.

GEMTEC's findings are considered reasonable based on AECOM's recent experience with other local projects upon the Toronto Islands.

Figure 4-10: Test Pit Location Plan

TEST PIT COORDINATES

Point #	Easting (m)	Northing (m)	Elevation (m)
TP1	629877.80	4831900.72	76.26
TP3	629724.70	4831165.51	75.92
TP4	629580.54	4831214.38	76.40
TP5	629338.26	4831507.20	76.20
TP6	629178.50	4831406.11	75.83
TP7	628917.94	4831654.00	75.95
TP8	628921.30	4831657.49	76.15
TP9	629180.37	4831413.50	76.05
TP10	629720.88	4831171.13	76.20

Source: Extracted from GEMTEC Report, 2023.

4.12.3 Compliance and Governance Requirements

Ontario Regulation 63/16: Water Taking under Part II.2 of the Environmental Protection Act:

Ontario Regulation 63/16 under the Environmental Protection Act governs water taking in Ontario, requiring permits for withdrawals exceeding 50,000 liters per day. The regulation ensures water-taking activities do not harm the environment or other users, with the Ministry of the Environment, Conservation, and Parks assessing applications based on environmental impact.

4.12.4 Gap Identification

The hydrogeological information currently available is adequate to complete the Environmental Assessment process, and no information gaps have been identified at this stage.

4.12.5 Recommendations

According to AECOM's consultation with Avia NG/ Envision (July 2024) who will be handling the Geotechnical Investigation of the Project, excavations into the water table will be avoided considering the inherent challenges associated with the high-water table in the Project Study Area.

Dewatering during the construction is anticipated to be limited to some localized dewatering activities, and no major dewatering is anticipated for construction of taxiways in areas near the lake. It is also noted that similar construction activities were carried out at the Billy Bishop Toronto City Airport over the course of three years (from 2015 to 2018). These activities involved methods of construction and pavement work like those proposed for the RESA work. No significant dewatering activities were required at that time during that construction period as well. However, any local dewatering must comply with Ministry of the Environment, Conservation, and Parks water taking permits and approvals in accordance with the Ministry of the Environment, Conservation, and Parks Permit to Take Water and meet regulatory requirements for daily volumes.

Based on the conceptual geological and hydrogeological understanding summarized above, should any of the proposed Environmental Assessment alternatives necessitate subsurface excavations to construct the required RESA elements, groundwater may be encountered that could require management and/or control to provide dry and stable working conditions. It is recommended that shallow test pits and/or boreholes be advanced within any area where excavations for construction of the preferred RESA are

planned to occur to confirm the presence or absence of groundwater within the required depths of excavations, such that options for groundwater management/control can be developed, if required.

4.13 Sediment Contamination

4.13.1 Overview of Completed Studies

There was no background information on sediment contamination available for review.

4.13.2 Summary of Findings from Technical Studies:

No findings from previous studies were available.

4.13.3 Compliance and Governance Requirements

O. Reg. 406/19: On-Site and Excess Soil Management:

Ontario Regulation 406/19 is designed to regulate the handling, reuse, and disposal of excess soil generated from construction and development projects in Ontario. The regulation aims to protect the environment and human health by ensuring that excess soil is managed responsibly.

4.13.4 Gap Identification

According to AECOM's consultation with Avia NG/ Envision (July 2024), dredging activities may be required during construction, although the probability of this requirement is considered low. Placement of material during the lake infilling will be required and both activities can mobilize sediment into the water column that may contain elevated chemical concentrations impacting water quality. It has been proposed to complete chemical analysis of the sediments to understand the environmental quality of the material.

4.13.5 Recommendations:

It is understood that the following parameters will be tested as part of the geotechnical borehole investigations currently being undertaken by Avia NG /Envision:

- Metals and Other Regulated Parameters;
- Petroleum Hydrocarbons and Benzene, Ethylbenzene, Toluene, Xylenes;
- Polycyclic Aromatic Hydrocarbons & Semi-Volatile Organic Compounds;
- Volatile Organic Compounds;

- Polychlorinated Biphenyls and Organochlorine Pesticides;
- Acid/Base/Neutral Compounds;
- Dioxins & furans; and,
- Polyfluoroalkyl Substances.

The results of the analysis may need to be used for two purposes:

- If dredging is required, the material generated during the removal will require offsite disposal. Any offsite disposal of excess soil will be required to meet the requirements of Ontario Regulation 406/19; and,
- Evaluation of impacts to aquatic life due to lake infilling and other potential construction activities.

Impacts to aquatic life due to construction activities should be considered based on the results of the geotechnical borehole investigation and evaluated in consultation with the Department of Fisheries and Oceans Canada to determine requirements for further studies and appropriate mitigation strategies.

Onshore materials should be managed onsite and within the airport property boundaries to ensure proper handling and compliance.

5. Next Steps

A summary of the gaps identified and recommended studies by each Environmental Assessment component discipline is outlined in Table 5-1 below.

Table 5-1: Gap Analysis Summary Table

Environmental Assessment Component	Gaps Identified	Recommendations	Potential Permit/Authorization Requirements	Timeline
Natural Environment: Terrestrial	■ Outdated field studies, in need of updating; and, ■ Updates to Species at Risk Habitat Screening due to changes in regulatory/legislative updates.	■ Complete an updated background information review within 120m of the proposed RESA footprint using online secondary sources; ■ Complete a one-day site-reconnaissance visit to confirm or revise vegetation community classification and boundaries; ■ Complete a search for any rare plants in or in the immediate vicinity of the construction footprint; and, ■ Update the Significant Wildlife Habitat and Species at Risk Habitat Screening.	■ Species At Risk Act; ■ Migratory Bird Convention Act, and 2022 Regulations; ■ Provincial Policy Statement; ■ Fish and Wildlife Convention Act; ■ City of Toronto Official Plan; and ■ Endangered Species Act.	■ The consultation with Ministry of the Environment, Conservation, and Parks will be initiated during the Environmental Assessment and Preliminary Design, and will be continued during the Design-Build Stage, if required.
Natural Environment: Fisheries	■ Outdated exiting conditions information, in need of updating; ■ Robust discussion of regulatory / legislative updates should be included to articulate what has changed since the AECOM 2017 Environmental Assessment; and, ■ American Eel, now Endangered since 2017, may be present within the Project Study Area. Require a more robust argument for why the Project is unlikely to impact it.	■ Updated existing conditions data specific to the RESA footprint should be collected and incorporated into future studies; ■ Any opportunities for data sharing among stakeholders should be encouraged; and, ■ Incorporate additional details and robust discussion of regulatory changes into the RESA Environmental Assessment document and relevant permit applications (as applicable).	■ Species At Risk Act; ■ Provincial Policy Statement; ■ Fish and Wildlife Convention Act; ■ City of Toronto Official Plan; ■ Endangered Species Act; and, ■ Federal Fisheries Act.	■ Request for Review to the Fisheries and Oceans Canada Fish and Fish Habitat Protection Program will be submitted based on the conceptual design details during the Environmental Assessment; ■ The permitting process will continue to Design-Build Stage; and, ■ Permit needs to be in place in advance of commencement of the in-water works and/or near/over water works.
Marine Physical Environment	■ All the information and data are currently available in previous studies, with multiple recent studies since AECOM's 2015 study, requiring no new research or information collection. Therefore, no gaps have been identified for the Marine Physical component of this study.	■ An updated air photo analysis should be completed, to better understand any changes to the physical environment conditions between 2015 and 2024; and, ■ Communication with other disciplines, specifically water quality and aquatics should be continued for any further updates to water quality and aquatic environment existing conditions (if any) as they pertain to the marine physical environment, i.e., any updated information on wave formation, currents etc. from the water quality modelling and/or any relevant physical characteristics observed during the aquatic ecologists field investigation (e.g., observed erosion).	■ City of Toronto Official Plan: Chapter 3: Risks Associated to Natural Hazards; ■ Ministry of Natural Resources Natural Hazard Policy; and, ■ Ontario Regulation 41/24 under Conservation Authority Act.	■ Preliminary Design; and, ■ Design-Build.
Water Quality	■ An updated review of water quality loadings to the harbour from all sources under existing and future conditions has not been acquired or reviewed; ■ The 2018 3-dimensional modelling of harbour circulation only considered the existing Don River outlet to the harbour via the Keating Channel; future conditions will consist of the shift of the Don River outlet south of the Keating Channel; and, ■ While pollutant loadings are expected to be reduced in the future, this is not formally addressed in the previous work. While the proposed RESA landmass is not expected to significantly change the hydraulic residence time in the harbour, this is not explicitly stated. The changes in hydraulic residence time associated with relocating the Don River outlet are not explicitly estimated.	■ Previous studies showed that the runway extension had a negligible impact on water quality in the harbour. The currently proposed RESA expanded landmass encroaches even less into the harbour, so its potential impacts on water quality are expected to be minimal. Therefore, additional water quality modelling is not recommended. Further discussions with the City of Toronto are recommended to understand up-to-date water quality modelling undertaken by the City to confirm this understanding and these recommendations.	■ Provincial Water Quality Objectives.	■ Potential for Provincial water quality objectives compliance issues to be confirmed at the Design-Build phase.

Environmental Assessment Component	Gaps Identified	Recommendations	Potential Permit/Authorization Requirements	Timeline
Socio-Economic Assessment	■ The previously identified non-use and use values associated with the Waterfront have remained the same, though, due to the changing population dynamics, it is important to update the conditions of the existing use values; and, ■ The gap analysis assumes that the Project effects will be different, as this Project seeks to continue the existing operations of the airport instead of expanding operations.	■ Review and organize data and information from available sources: - A desktop review of existing published sources of information pertinent to the RESA work scope; ■ Gather new information: - Targeted interviews and engagement with stakeholders that represent views, values, and interests of residents, recreation users, local businesses, and tourism; and, ■ Additional considerations should be made to understand what impacts will occur if the airport is no longer operational.	■ Follows best practices to proactively address potential socio-economic effects and gain public and stakeholder support.	■ Environmental Assessment.
Marine Navigation	■ In need of more information on the charts and other navigational guidance that boaters use in the Project Study Area to understand the current restrictions that boaters experience and any changes that could happen with the RESA Alternatives, including: - Increased current velocities in the entrance to the Western Channel; - Increased wave height because of the western RESA landfill revetment slope; and, - Reduction in the largest vessel beam that can safely navigate the Western Channel.	■ Navigational chart CHS 2085 must be obtained to understand the navigational guidance and restrictions that boaters in the area already encounter, revetment stone on wave reflection and diffraction; and, ■ The maneuverability of recreational and commercial vessels at the Western Channel entrance should be assessed. This should include calculating the reduction in channel width caused by the lakefill and considering the influence of lakefill revetment stone on wave reflection and diffraction.	■ Small Vessel Regulations of the Canada Shipping Act; ■ Toronto Port Authority Practices and Procedures, under Canada Marine Act, Section 56; and, ■ Canadian Navigable Waters Act, Navigation Protection Program.	■ Environmental Assessment.
Air Quality	■ Potentially outdated air monitoring data available for the criteria air contaminants; ■ In the AECOM 2017 Environmental Assessment, 50 receptors were identified within the study area, including homes, parks, schools, and other key locations. Due to ongoing development, additional receptors may have been added since the 2017 study; ■ Potentially outdated values for the Ontario Ambient Air Quality criteria, Federal Government Canadian Ambient Air Quality Standards and the Toronto Public Health Toxic Reference Values for the contaminant thresholds and risk factors; and, ■ A quantitative review of the emissions and potential impact from construction phase from the previous AECOM 2017 Environmental Assessment is a potential gap, requiring review, when assessing the proposed RESA.	■ Due the date of the previous study, it is recommended that: - More recent air monitoring data for the criteria air contaminants be reviewed in future air quality assessments. This includes checking for changes in monitoring station locations and evaluating if there has been an increase in background concentrations; - The current land use within close proximity to the proposed RESA be reviewed to identify any new receptors that should be considered in future air quality assessments; - The most recent versions of the Ontario Ambient Air Quality criteria, Federal Government Canadian Ambient Air Quality Standards, and Toronto Public Health Toxic Reference Values for contaminant thresholds and risk factors be reviewed to confirm if any values have been modified; ■ A review of all alternatives for the proposed RESA is recommended. The RESAs 2 and 3 consider several ancillary airfield improvements, which could positively impact air quality within Study Area, expected to reduce the taxi distance and taxi times and as a result, reduce air emissions during operational phase; and, ■ It is recommended that, upon selection of the preferred alternative for the proposed RESA, a Construction Phase Air Quality Assessment be conducted to review the potential for air quality impacts during the construction phase. A dispersion modelling using an advanced air dispersion model (AERMOD) is recommended to determine the maximum point of impingement concentrations at the identified receptors, for each significant contaminant of concern.	■ Ontario Ambient Air Quality Criteria; and, ■ Canadian Ambient Air Quality Standards.	■ Environmental Assessment; and, ■ Construction.

Environmental Assessment Component	Gaps Identified	Recommendations	Potential Permit/Authorization Requirements	Timeline
Noise	■ Environmental Assessments in Ontario typically require the assessment of construction noise and vibration, which have not been previously assessed; ■ Relocation of the taxiways B and D could impact the perceived noise levels from the Billy Bishop Toronto City Airport. These potential modifications have not been numerically evaluated; and, ■ The potential relocation of the localizer can have an effect on the airborne aircraft noise. This has not been evaluated.	■ Once the preferred alternative design is selected, gather the needed information to conduct a construction noise assessment; ■ To evaluate the potential perceived noise impact of taxiway relocations, and potential taxiway noise barriers (depending on the alternative) the analysis should concentrate on the difference in noise contributions of the taxiways being relocated; and, ■ The potential effects of relocating the localizer (in some alternatives) at the west end of Runway 26 needs to be evaluated against the established Noise Exposure Forecasts from the 2022 SNC Lavalin Report.	■ Noise Emissions Standards (NPC 115 and NPC 118); and, ■ Noise Exposure Forecasts criteria as outlined in the Tripartite agreement.	■ Environmental Assessment; ■ Preliminary Design; and, ■ Construction.
Built Form and Land Use	■ Changes in development plans over the past seven years may need further review and assessment for compatibility.	■ Review and update of directive documentation; and, ■ Once the preferred alternative design is selected, additional information may need to be gathered to further refine the built form and land use compatibility assessment as input into the overall Environmental Assessment Study Report.	■ Toronto Island Airport Zoning Regulations (SOR/85-515); ■ City of Toronto Official Plan; and, ■ Central Waterfront Secondary Plan (OPA 257).	■ Environmental Assessment; and, ■ Preliminary Design.
Traffic and Transportation	■ Outdated traffic data does not capture recent changes in urban development and transportation patterns, for example, the effects of travel patterns due to the construction of the pedestrian tunnel have not been gathered.	■ Given that there will be no increase in the passenger activity level, the impact to the adjacent mainland intersections identified as part of the AECOM 2017 Environmental Assessment analysis can be considered conservative, especially since the effects of the pedestrian tunnel on vehicular traffic had not been considered as the pedestrian tunnel was not operational at that time. The pedestrian tunnel is likely to further reduce vehicular trips made to and from the airport. Therefore, no update to the Traffic and Transportation data are recommended for evaluating the RESA alternatives.	■ City of Toronto Traffic by-law (applicable during construction).	■ Environmental Assessment.
Archaeology	■ The 2017 study area was compared to the landmass to be extended on both ends to accommodate the RESA. Currently, there are three alternatives presented, including RESAs 1 through 3, therefore no further terrestrial archaeological work is required; and, ■ An in-water Stage 2 Marine Archaeological Assessment has not been completed.	■ An additional Stage 1 Archaeological Assessment is required for a portion of the RESA 3 footprint that extends beyond the area cleared in AECOM's 2017 Archaeology Study; and, ■ There is high potential for the recovery of marine archaeological resources as there have been several shipwrecks that have been lost in Toronto Harbour and potentially in the vicinity of the Project Study Area. It is possible that these resources may be impacted by the proposed RESA and mitigation measures are required.	■ Ontario Heritage Act; ■ Provincial Policy Statement; and, ■ City of Toronto Official Plan.	■ Environmental Assessment; and, ■ Preliminary Design.
Cultural Heritage	■ Three additional cultural heritage resources with addresses on Lakeshore Avenue in the area of Hanlan's Point in proximity to the previous AECOM 2017 Environmental Assessment study area are noted as gaps to the prior 2015 Cultural Heritage Memo.	■ Consult the Cultural Heritage Resource Assessment for the Toronto Island Park Master Plan (currently in progress), to confirm all identified cultural heritage resources within, adjacent to, or in proximity to the Project Study Area; and, ■ Completion of further heritage reporting may be required, including a Cultural Heritage Resource Assessment for the Project and Heritage Impact Assessments if there are determined to be adverse direct or indirect impacts to cultural heritage resources.	■ Ontario Heritage Act; ■ Provincial Policy Statement; and ■ City of Toronto Official Plan.	■ Environmental Assessment; and, ■ Preliminary Design.
Groundwater	■ The hydrogeological information currently available is adequate to complete the Environmental Assessment process, and no information gap has been identified at this stage.	■ It is recommended that shallow test pits and/or boreholes be advanced within any area where excavations for construction of the preferred RESA are planned to occur to confirm the presence or absence of groundwater within the required depths of excavations, such that option for groundwater management/control can be developed, if required.	■ Ontario Water Resources Act; and, ■ Ontario Regulation 63/16 under the Environmental Protection Act.	■ Preliminary Design; and, ■ Design Build.

Environmental Assessment Component	Gaps Identified	Recommendations	Potential Permit/Authorization Requirements	Timeline
Sediment Contamination	■ The results of sediment sampling are needed to identify and confirm any potential sediment contamination within the Project construction footprint.	■ Depending on the results of sediment sampling, an excess soils management plan may be required; and, ■ Toxicological parameters of concern for fisheries should be considered and evaluated in consultation with Fisheries and Oceans Canada to determine requirements for further studies and appropriate mitigation strategies to be implemented during any potential dredging activities.	■ Canadian Environmental Quality Guidelines ; and ■ Ontario Regulation 406/19: On-Site and Excess Soil Management.	■ Preliminary Design; and, ■ Design Build.

This gap analysis memorandum will be made available to Transport Canada and the City of Toronto for review and feedback. Upon receiving all comments, the AECOM team will review and address the comments, as appropriate ensuring all concerns are properly considered. The City may also decide to consider a peer review of the report for selected components. The study team will initiate the Environmental Assessment process according to AECOM's detailed June 2024 work plan, which includes several critical steps:

- **Establish Baseline Conditions:** With PortsToronto' s approval of AECOM's additional baseline studies outlined in this memorandum and updated detailed work plan based on the gap analysis, data collection and analysis for the Environmental Assessment will be undertaken to update the baseline conditions, as required. The local environmental conditions within the Project Study Area will be identified through a combination of desktop review and field studies by practitioners using industry standard techniques and guidelines. With respect to the aquatic baseline update, PortsToronto, Toronto and Region Conservation Authority and AECOM will confirm the most appropriate approach.
- **Develop Evaluation Criteria and Complete Evaluation of Alternatives**: Criteria will be developed to evaluate the RESA's proposed alternatives based on the following environmental components:
  - Natural Environment;
  - Marine Navigation;
  - Marine Physical Environment;
  - Air Quality;
  - Water Quality;
  - Noise;
  - Socio-Economic Environment;
  - Built Form and Land Use;
  - Traffic and Transportation;
  - Archaeology; and,
  - Cultural Heritage.
- **Effects Assessment:** Conduct a comprehensive net effects assessments of the preferred alternative identified for the Project on the environmental components.
- **Environmental Assessment Study Report:** The study process and findings will be documented in an Environmental Assessment Study Report. The report will include the need for the Project and the steps of the Environmental

Assessment process, project description, existing baseline environmental conditions, evaluation of alternatives, description of the preferred alternative, and results of effects assessment including proposed mitigations, future permitting, approval requirements and commitments. The Environmental Assessment Study Report will also include a comprehensive summary of PortsToronto' s consultation efforts with the public and stakeholders, as well as its engagement with Indigenous communities, all specifically centred on the Project. A copy of the Environmental Assessment Study Report will be provided to Transport Canada and the City of Toronto for their review prior to the report being released to the public.

The findings from the baseline conditions studies, evaluation of alternatives, preliminary preferred alternative, and effects assessment will be presented to the public in the public meeting anticipated for October 2024.

Understanding that MASS LBP will be leading the consultation component of the RESA Environmental Assessment , AECOM will continue to provide support to the consultation team as outlined in our June 2024 work plan.

AECOM will also commence consultation with the regulatory agencies to identify the environmental permitting requirements for the RESA. Recognizing that regulatory agencies might not issue the final authorizations and approvals until the later stages (90%) of the design, where possible, AECOM will proactively work to obtain draft permits or agreements in principle, based on the design progress. This approach aims to secure preliminary regulatory alignment and approvals within the RESA Environmental Assessment timeline.

6. Environmental Assessment Schedule

Table 6-1 below outlines the key schedule milestones.

Table 6-1: Key Environmental Assessment Milestones

Task	Timeline
Public Meeting and Open House #1	July 2024
Establish Baseline Conditions	July- August 2024
Develop Evaluation Criteria and Complete Evaluation of Alternatives	September 2024
Public Meeting and Open House #2	October 2024
Effects Assessment	October-November 2024
Draft Environmental Assessment Study Report	November 2024
Post for Public Review	April 2025[12]
Final Environmental Assessment Study Report	June 2025

Note: The above timeline relies on the assumptions outlined in the AECOM 2024 work plan.

12. Additional time required for completion of the French translation of the Environmental Assessment Study Report and associated appendices under Official Languages Act.

7. References

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Appendix A

Communications with the City of Toronto and Agencies

- City of Toronto
- IAAC
- MECP
- Transport Canada

AECOM

City of Toronto

TORONTO

Waterfront Secretariat
David Stonehouse, Director

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City Hall, 12th Floor, East Tower
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M5H 2N2

Tel: (416) 392-8113
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June 1, 2015

Angela Homewood
Project Manager & EA Specialist
Infrastructure, Planning & Environment
PortsToronto
60 Harbour Street
Toronto ON M5J 1B7

RE: Request for City of Toronto Comments on Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport – Draft Study Design Report

Dear Ms. Homewood:

The City of Toronto has reviewed the draft study design and scope for the Environmental Assessment of Proposed Runway Extension and Introduction of Jets at Billy Bishop Toronto City Airport. Enclosed are comments on the draft document dated April 2015. Please be advised that we expect that City staff will provide additional comments as the study unfolds, and will conduct a detailed review of the draft final report in the fall. City staff are available to discuss these comments further if required.

The April 1, 2 and 3, 2014 City Council decision provided clear direction on a negotiating framework for moving forward the review of the BBTCA expansion proposal. This framework outlined conditions precedent that included, amongst other items, agreement on a caps and phasing framework for BBTCA. It is the City's expectation that the studies being undertaken by PortsToronto will address the conditions adopted by City Council, including the caps and phasing framework.

Proposed EA Study Design and Scope:

- The City of Toronto has a strong interest in understanding the potential impacts of airport growth under existing and expanded (jet-powered aircraft and runway extensions) operations prior to any decision to amend the Tripartite Agreement. The City has raised concerns about current airport operations consistently during the review and requests that the EA include an assessment of existing conditions against the proposed scenarios.

- A "Do Nothing" scenario that assesses the continuation of existing conditions without any improvement to airside and groundside operations should be assessed as part of the EA. This scenario should incorporate current issues that have been raised by the City and the local community such as, but not limited to: groundside traffic, noise and air quality. These issues should be documented and assessed as part of the establishment of a base condition.

- The "Proposed Growth" scenario (which includes jet-power aircraft, runway extensions, and an increase in daily slots) is not consistent with the caps and phasing framework that was approved by City Council on April 1, 2 and 3, 2014. Staff are concerned that this growth scenario cannot be realistically accommodated given constraints imposed by airport and groundside facilities, and the context of the airport on Toronto's Central Waterfront.

- The EA scoping document should clearly describe the project and the project components (runway extension, landfill, navigational aides, etc.), in addition to the scenarios proposed under the 2012 permitted and 2015 proposed growth scenarios. The EA should be precise about the project design standards (i.e, TP312 version 4) in order to clarify the scope of the various scenarios.

- The Airport Master Plan update should be drafted and circulated in advance of the completion of the EA. Agreement on the vision and role of the BBTCA, the future volume of scheduled commercial and general aviation activities and passenger and flight forecasts should be finalized and assessed as part of the EA scenarios. Staff are particularly interested in the impact on general aviation users of the airport in a scenario with jet-powered aircraft, runway-extensions and an increase in daily slots for commercial scheduled aircraft and passenger volumes.

Transportation:

Transportation Planning staff have provided the following comments:

- The EA needs to clearly show how it is linked to other related studies such as the Bathurst Quay Neighbourhood Plan (BQNP) and the Airport Master Update. The BQNP has a different set of assumptions for airport growth based on the Council-approved caps and phasing framework.

- The caps and phasing framework approved by City Council is based on the vehicle capacity of the local road network around the airport. If the EA is going to examine scenarios beyond the caps and phasing framework, it must (i) acknowledge existing conditions, (ii) examine how the additional passengers and traffic will be accommodated, and (iii) demonstrate that there will be no greater impact on existing traffic conditions.

- The boundary of the transportation assessment should extend further north to include Fleet Street as the effect may have an impact on transit service along Fleet Street. In addition, Fleet Street should be assessed as part of the Bathurst/Lake Shore Boulevard intersection.

Toronto Public Health and Environment and Energy:

Toronto Public Health and Energy and Environment staff have provided the following comments:

1. The Environmental Assessment:

Given repeated declarations (as in the Study Design document prepared for the EA) that an EA is not required by Provincial or Federal legislation (as in Section 2, as well as in Section 2.1 and in

Section 2.2 and also in Section 3 etc) – consider eliminating the repetitions or complement them. Clarifying why the EA is being followed; is it is because City Council's approval for runway extensions and jets etc is required before their agreeing to consider changing their Tripartite Agreement? (which is stated once - as in Section 1.2)

The Proposed Study Area:

The proposed study area is limited to key receptors along the Waterfront – we recommend expanding the study area across the same large city areas (six Wards) as were examined by Golder Associates in 2013 or provide a detailed rationale as to why the previous study area is neither suitable nor necessary.

2. Study Contents:

Modelling/Monitoring:

- Utilize City's AQ model data to establish the baseline across the same six Wards
  - EED has offered to make results of recent city wide modelling of 30 substances. available to establish the baseline (managed on Golder computer bank system)
  - This may be augmented by the chemistry of the AQ modelling undertaken by RWDI for Peel Region.
- Local and site specific sensitive receptor AQ monitoring be undertaken to verify and refine the AQ baseline modelled data.
- Related land vehicle traffic (and especially re taxis) be modeled -- including congestion and idling emission issues by location issues - and incorporated.
- RWDI model the AQ resulting from various "plane-and-runway" scenarios as a set of varying conditions that add to the base case.
- The existing monitoring data from the MOE & NAPS stations has limitations – e.g. the closest acrolein monitoring station is in Windsor – these data may not be representative of the site conditions and it may overestimate or underestimate potential impacts.

Comparison of results to health benchmarks:

- In addition to the Ontario AAQCs, evaluate the projected AQ impacts against health based carcinogenic and non-carcinogenic benchmarks, and the AQBAT risk coefficients to evaluate health risk from criteria air pollutants.
- Use of toxicity reference values (TRVs) that have been endorsed by TPH.
- In addition to evaluating chronic exposures, consider the evaluation of acute exposures if there are times during the day with more intense airport/associated traffic activity that would result in elevated emissions.

Climate change:

- In addition to emission respecting air quality, an inventory of all GHG emissions under both present and future proposes uses should be included.

3. Comments re: Appendix A (Air Quality):

- AQ and odours (fuel storage and unburnt fuel from planes)
  - we recommend include that in the scope of work, TPH has received a number of reports of fuel odours in the residential area adjacent to the BBTCA.
  - use the emission profile & associated odour thresholds of various substances to predict odour impacts at key locations.

- Assessment of deposited materials ("black soot") in the vicinity of BBTCA
  - TPH is aware of these concerns, together with the MOE we have taken samples of the "black soot" for lab analysis – has any consideration been given to taking actual samples?

- Assessing direct health impacts
  - As stated previously, we recommend the use of appropriate TRVs to quantify the impacts from both chronic and acute exposures; in addition, the use of AQBAT risk coefficients to assess impacts from criteria pollutants.

4. Comments re: Noise Assessment scope of work recommendations:

- Include noise measurements at key sensitive locations, this should entail an assessment of "short duration" noise from activities such as run up engine testing.
- Assess impacts of noise on indoor environments, this should include sensitive settings such us the waterfront school.
- Compare the noise modelling/measurements with health-based noise guidelines:

Health Effect	**Threshold/Guideline**	**Reference**
Environmental insomnia	42 $L_{Aeq,\ 8hr}$ (23-07 hr)	WHO. 2009
Sleep disturbance, outside bedrooms	45 $L_{Aeq,\ 8hr}$ (23-07 hr)	WHO. 1999b
Sleep disturbance, night noise guideline	40 $L_{Aeq,\ 8hr}$ (23-07 hr)	WHO, 2009
Sleep disturbance, interim target	55 $L_{Aeq,\ 8hr}$ (23-07 hr)	WHO, 2009
Hypertension	70 $L_{Aeq,\ 16hr}$ (06-22 hr)	Health Council of the Netherlands, 1999
Ischemic health disease	70 $L_{Aeq,\ 16hr}$ (06-22 hr)	Health Council of the Netherlands, 1999
Sleep pattern	< 60 $L_{Aeq,\ 8hr}$ (23-07 hr)	Passchier-Vermeer and Passchier, 2000
Subjective sleep quality	40 $L_{Aeq,\ 8hr}$ (23-07 hr)	Health Council of the Netherlands, 1999
Mood next day	< 60 $L_{Aeq,\ 8hr}$ (23-07 hr)	Health Council of the Netherlands, 1999
Increased avg. movement during sleep	42 $L_{Aeq,\ 8hr}$ (23-07 hr)	WHO, 2009
Self-reported sleep disturbance	42 $L_{Aeq,\ 8hr}$ (23-07 hr)	WHO, 2009
Use of sleep-aid drugs and sedatives	42 $L_{Aeq,\ 8hr}$ (23-07 hr)	WHO, 2009
Moderate annoyance, outdoor living area	50 $L_{Aeq,\ 16hr}$	WHO, 1999b
Serious annoyance, outdoor living area	55 $L_{Aeq,\ 16hr}$	WHO, 1999b

Annoyance, difference between baseline and project	>6.5% difference in %HA	Health Canada, 2010

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Heritage Preservation Services:

Heritage Preservation Services staff will review the Stage 1 Archaeological reports for both land and water areas and provide comments at that time.

If you have any questions, please contact Christopher Dunn, Waterfront Project Manager, at (416) 395-1211 or email cdunn@toronto.ca.

Sincerely,

David Stonehouse, Director
Waterfront Secretariat

cc John Livey, Deputy City Manager, Cluster B
Nigel Tahair, Transportation Planning
Barbara Lachapelle, Toronto Public Health
Christopher Morgan, Energy & Environment Office
Susan Hughes, Heritage Preservation Services
Matthew Wheatley, Swerhun Facilitation

AECOM

IAAC

PORTS TORONTO

July 16, 2024

Amy Sen
A/Director
Ontario Region
Impact Assessment Agency of Canada
600-55 York St,
Toronto ON M5J 1R7

Re: Billy Bishop Toronto City Airport - Runway End Safety Area (RESA) Project

Dear Amy,

On behalf of PortsToronto who is the owner and operator of Billy Bishop Toronto City Airport (BBTCA, the Airport), I am sending this letter to you to advise on the Runway End Safety Area (RESA) Project and confirm our understanding that our proposal is not a designated project as defined in the Physical Activities Regulations of the Impact Assessment Act (IAA).

PortsToronto is in the process of completing an environmental assessment (EA) to study the effects of the RESA for the main commercial runway, Runway 08/26, to comply with new Canadian Aviation Regulation (CAR) 302.600 requirements in response to safety concerns identified by the Transportation Safety Board of Canada.

At the request of PortsToronto, staff from the Impact Assessment Agency met with us on May 7, 2024, to discuss the proposal.

Background:

PortsToronto has initiated an EA to evaluate potential impacts of the RESA project. The EA is being conducted to assist PortsToronto, agencies, Indigenous communities, the public and various stakeholders to understand and review the RESA project which has been mandated by Transport Canada.

At BBTCA, RESAs are proposed to be located at both ends of the main runways and are designated areas of open space designed to reduce damage to aircraft in cases where aircraft overrun the end of a runway or undershoot and land prior to the runway. PortsToronto has contracted Avia NG who completed Runway 08/26 RESA Alternatives Study and are now working on the preliminary design work of the RESA Project. This study reviewed the feasibility of six (6) RESA alternatives ranging from non-physical compliance methods to optimizing existing land and creating new landmasses with protection breakwater structures.

Alternatives were assessed against several factors including commercial traffic operational viability, ease of implementation, marine navigation, environmental and community effects, permitting, and cost. None of the RESA alternatives will change the existing runway operations, capacity, or the type of aircraft utilizing the runway.

The airport sits on 210 acres of land on Toronto Island. The Toronto Port Authority owns 78.5% of the land with 165 acres; the City of Toronto owns 20% of the land with 42 acres; and Transport Canada owns 1.5% of the land with 3 acres. The ownership of the lands is as follows:

- On land, includes the areas noted in Area A (owned by the Toronto Port Authority), Area D (owned by Transport Canada) and Area E (owned by Transport Canada) which is depicted in Attachment A.
- In the water, includes the area noted in the water lots at each end of the runway (owned by the Toronto Port Authority) which is depicted in Attachment B.

Pre-consultation meetings have occurred PortsToronto and the Impact Assessment Agency of Canada (IAAC). Since PortsToronto owns the water lots around the airport lands, Section 82 (projects on federal lands) is not triggered under PortsToronto' s Letters Patent. The IAAC and Transport Canada have advised that the RESA project is not an activity listed under the Physical Activities Regulation of the Impact Assessment Act. While the RESA project does not trigger a Municipal Class EA process, the City of Toronto's Official Plan mandates an EA for lake filling projects in Lake Ontario to ensure the protection or enhancement of water quality and quantity, as well as terrestrial and aquatic habitat.

Context:

The EA will be carried through as a voluntary non-statutory process, established through consultation with federal, provincial, and municipal agencies. This process will evaluate potential environmental impacts of various RESA alternatives for Runway 08/26 that will comply with Transport Canada standards for RESAs. For this EA, we have retained a consulting team led by AECOM and supported by SLR Consulting Ltd.

In March 2023, PortsToronto began working group meetings with Transport Canada and City of Toronto to begin discussions on Tripartite Agreement amendments for RESA compliance. In April 2024, a consultation and outreach strategy commenced with the public, stakeholders, and government agencies encouraging involvement in the EA process early on during the scoping phase. The RESA consultation and engagement strategy is inclusive of agency and Indigenous community meetings, community and stakeholder meetings, and public meetings. In addition to public consultation, a project website (www.safecleanquiet.ca) will be available throughout the process for easy access to information and where updates will be posted. A Technical Advisory Committee (TAC) has been established, comprising senior representatives from the City of Toronto, Transport Canada, Toronto and Region Conservation Authority, and PortsToronto in addition to Avia NG, and their geotechnical and coastal engineering subconsultants. Six TAC meetings are scheduled to take place throughout the course of the project which will inform the projects milestone activities and deliverables.

A comprehensive public and stakeholder consultation for the environmental assessment will be undertaken by PortsToronto during the RESA alternatives process which commenced in January and will continue to December 2024.

Request

We request a letter from the Impact Assessment Agency confirming concurrence with our understanding that there is no requirement at the provincial level for PortsToronto to complete an environmental assessment for the RESA project. To ensure transparency during this environmental assessment process, we would like to post letters that we receive from agencies to our project website.

Should you have any questions or require more detail please do not hesitate to contact Angela Homewood, Project Manager and EA Specialist at (416) 863-2000 or via e-mail at AHomewood@TorontoPort.com.

Yours very truly,

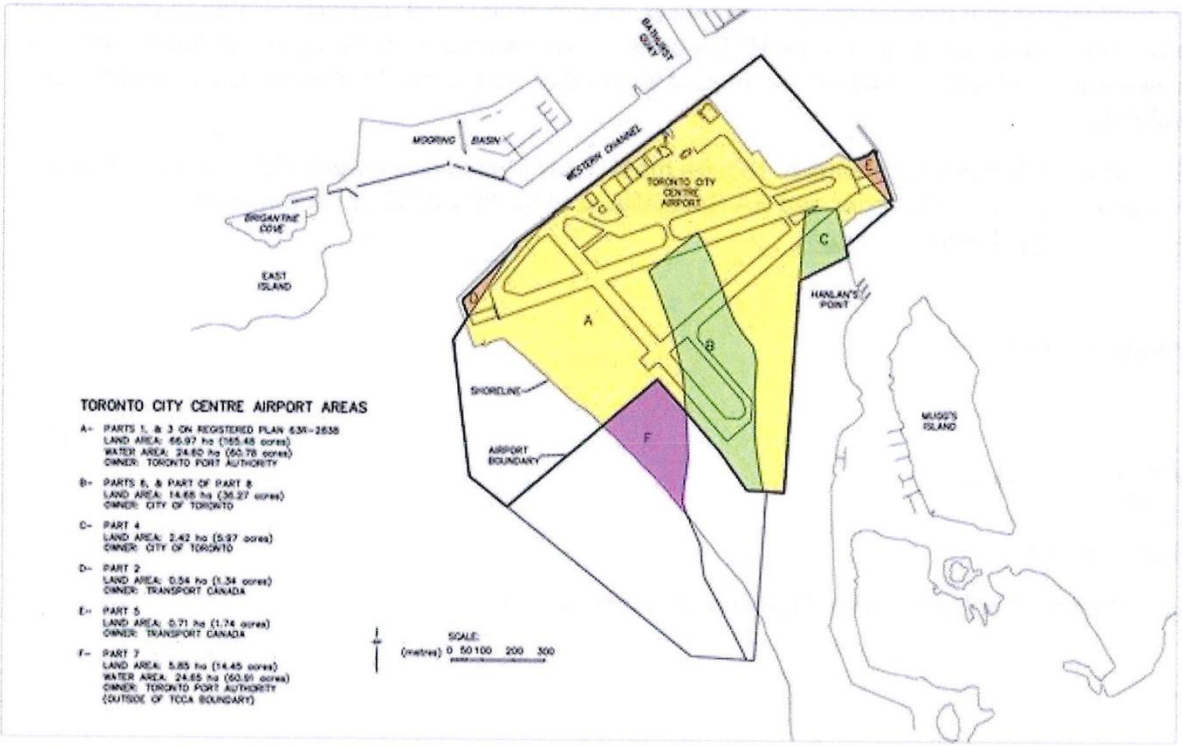
Bojan Drakul

Bojan Drakul

Vice President, Infrastructure, Planning, and Environment

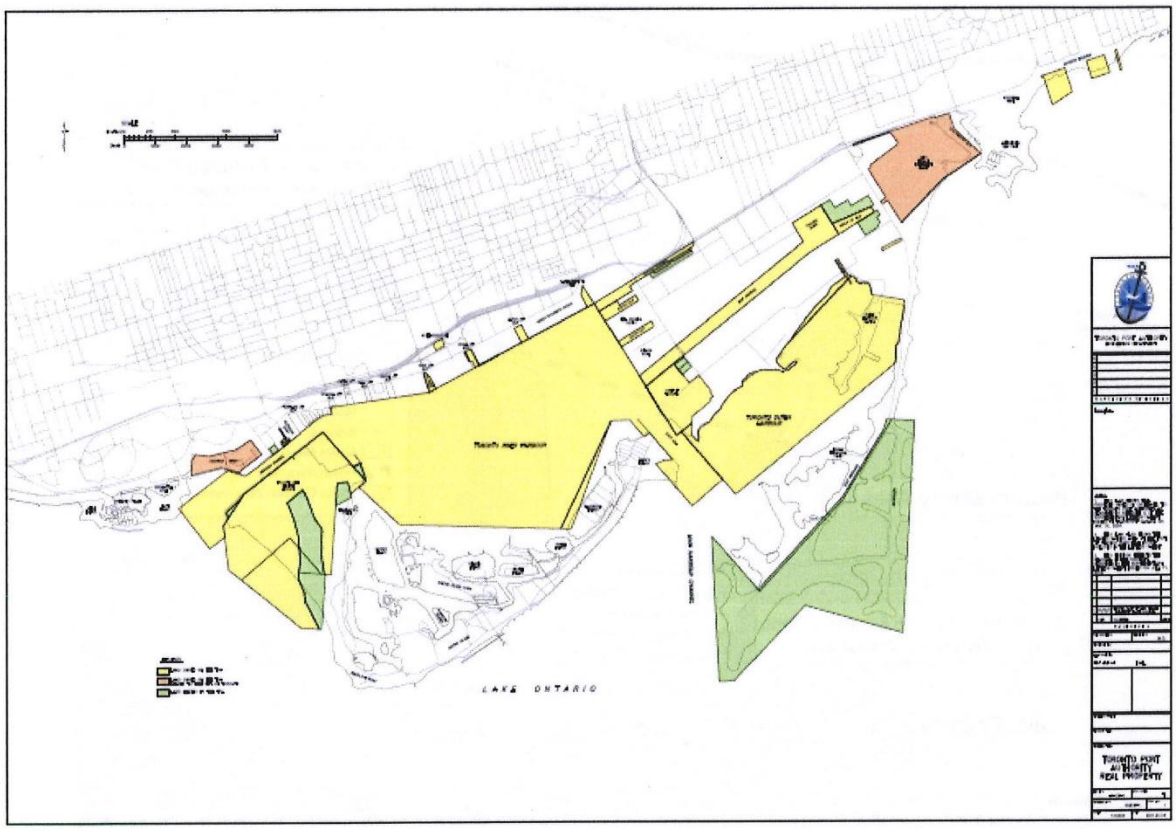
Attachment A – Land Ownership

Billy Bishop Toronto City Airport sits on 210 acres of land on Toronto Island. The Toronto Port Authority owns 78.5% of the land with 165 acres; the City of Toronto owns 20% of the land with 42 acres; and Transport Canada owns 1.5% of the land with 3 acres. The ownership on land, includes the areas noted in Area A (owned by the Toronto Port Authority), Area D (owned by Transport Canada) and Area E (owned by Transport Canada).



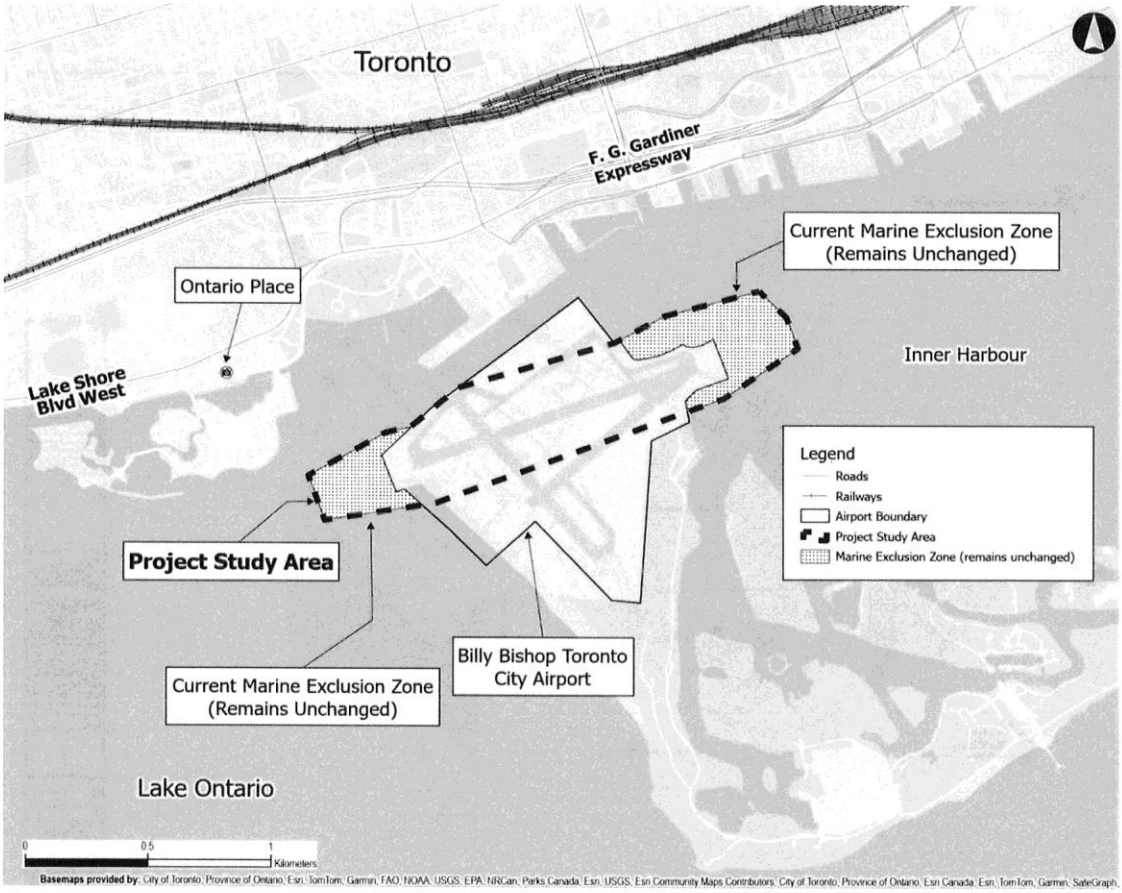
Attachment B – Water Lot Ownership

Billy Bishop Toronto City Airport sits on 210 acres of land on Toronto Island. The Toronto Port Authority owns 78.5% of the land with 165 acres; the City of Toronto owns 20% of the land with 42 acres; and Transport Canada owns 1.5% of the land with 3 acres. The ownership of the lands and water lots includes the area noted in the water lots at each end of the runway (owned by the Toronto Port Authority) depicted in yellow colour.



Attachment C – Project Study Area

The project study area is outlined below and includes the lands and water lot within the Marine Exclusion Zone, which will not be changiJuly 4, 2024



AECOM

MECP

PORTS TORONTO

July 16, 2024

Nick Colella
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Project Coordination Unit
Environmental Assessment Branch
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135 St. Clair Avenue West 1st Floor,
Toronto, ON
M4V 1P5

Re: Billy Bishop Toronto City Airport - Runway End Safety Area (RESA) Project

Dear Nick,

On behalf of PortsToronto who is the owner and operator of Billy Bishop Toronto City Airport (BBTCA, the Airport), I am sending this letter to you to advise on the Runway End Safety Area (RESA) project and confirm our understanding that this proposal does not trigger the requirements of the provincial *Environmental Assessment Act* (EAA).

PortsToronto is in the process of completing an environmental assessment (EA) to study the effects of the RESA for the main commercial runway, Runway 08/26, to comply with new Canadian Aviation Regulation (CAR) 302.600 requirements in response to safety concerns identified by the Transportation Safety Board of Canada.

Background:
PortsToronto has initiated a non-statutory EA to evaluate potential impacts of the RESA project. The EA is being conducted to assist PortsToronto, agencies, Indigenous communities, the public and various stakeholders to understand and review the RESA project which has been mandated by Transport Canada.

At BBTCA, RESAs are proposed to be located at both ends of the main runways and are designated areas of open space designed to reduce damage to aircraft in cases where aircraft overrun the end of a runway or undershoot and land prior to the runway. PortsToronto has contracted Avia NG who completed Runway 08/26 RESA Alternatives Study and are now working on the preliminary design work of the RESA Project.. This study reviewed the feasibility of six (6) RESA alternatives ranging from non-physical compliance methods to optimizing existing land and creating new landmasses with protection breakwater structures. Alternatives were assessed against several factors including commercial traffic operational viability, , ease of implementation, marine navigation, environmental and community effects, permitting, and cost. None of the RESA alternatives will change the existing runway operations, capacity, or the type of aircraft utilizing the runway.

The airport sits on 210 acres of land on Toronto Island. The Toronto Port Authority owns 78.5% of the land with 165 acres; the City of Toronto owns 20% of the land with 42 acres; and Transport Canada owns 1.5% of the land with 3 acres. The ownership of the lands is as follows:

- On land, includes the areas noted in Area A (owned by the Toronto Port Authority), Area D (owned by Transport Canada) and Area E (owned by Transport Canada) which is depicted in Attachment A.
- In the water, includes the area noted in the water lots at each end of the runway (owned by the Toronto Port Authority) which is depicted in Attachment B.

Pre-consultation meetings have occurred PortsToronto and the Impact Assessment Agency of Canada (IAAC). Since PortsToronto owns the water lots around the airport lands, Section 82 (projects on federal lands) is not triggered under PortsToronto' s Letters Patent. The IAAC and Transport Canada have advised that the RESA project is not an activity listed under the Physical Activities Regulation of the Impact Assessment Act. While the RESA project does not trigger a Municipal Class EA process, the City of Toronto's Official Plan mandates an EA for lake filling projects in Lake Ontario to ensure the protection or enhancement of water quality and quantity, as well as terrestrial and aquatic habitat.

Context:
The EA will be carried through as a non-statutory process, established through consultation with federal, provincial, and municipal agencies. This process will evaluate potential environmental impacts of various RESA alternatives for Runway 08/26 that will comply with Transport Canada standards for RESAs. For this EA, we have retained a consulting team led by AECOM and supported by SLR Consulting Ltd.

In March 2023, PortsToronto began working group meetings with Transport Canada and City of Toronto to begin discussions on Tripartite Agreement amendments for RESA compliance. In April 2024, a consultation and outreach strategy commenced with the public, stakeholders, and government agencies encouraging involvement in the EA process early on during the scoping phase. The RESA consultation and engagement strategy is inclusive of agency and Indigenous community meetings, community and stakeholder meetings, and public meetings. In addition to public consultation, a project website (www.safecleanquiet.ca) will be available throughout the process for easy access to information and where updates will be posted. A Technical Advisory Committee (TAC) has been established, comprising senior representatives from the City of Toronto, Transport Canada, Toronto and Region Conservation Authority, and PortsToronto in addition to Avia NG, and their geotechnical and coastal engineering subconsultants. Six TAC meetings are scheduled to take place throughout the course of the project which will inform the projects milestone activities and deliverables.

A comprehensive public and stakeholder consultation for the environmental assessment will be undertaken by PortsToronto during the RESA alternatives process which commenced in January and will continue to December 2024.

Request
We request a letter from the Environmental Assessment Branch confirming concurrence with our understanding that there is no requirement at the provincial level for PortsToronto to complete an environmental assessment for the RESA Project. To ensure transparency during this environmental assessment process, we would like to post letters that we receive from agencies to our project website.
Should you have any questions or require more detail please do not hesitate to contact Angela Homewood, Project Manager and EA Specialist at (416) 863-2000 or via e-mail at AHomewood@TorontoPort.com.

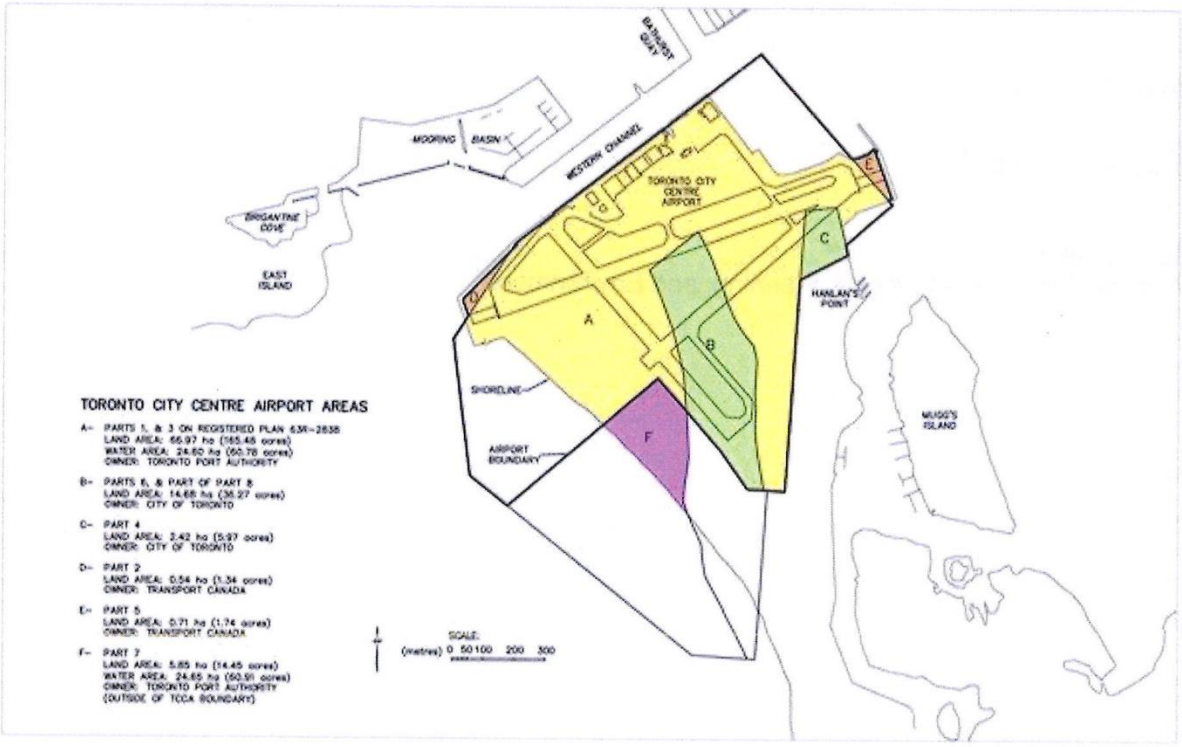
Yours very truly,

Bojan Drakul

Bojan Drakul
Vice President, Infrastructure, Planning, and Environment

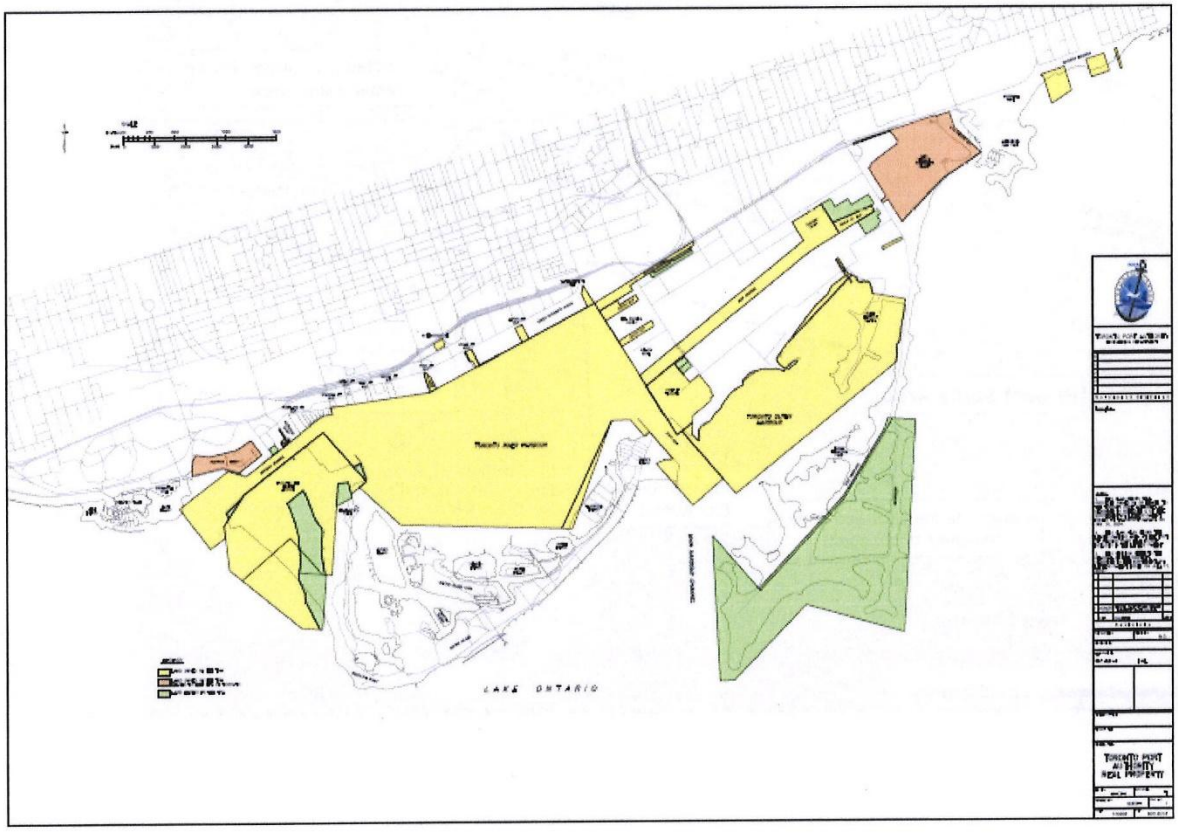
Attachment A – Land Ownership

Billy Bishop Toronto City Airport sits on 210 acres of land on Toronto Island. The Toronto Port Authority owns 78.5% of the land with 165 acres; the City of Toronto owns 20% of the land with 42 acres; and Transport Canada owns 1.5% of the land with 3 acres. The ownership on land, includes the areas noted in Area A (owned by the Toronto Port Authority), Area D (owned by Transport Canada) and Area E (owned by Transport Canada).



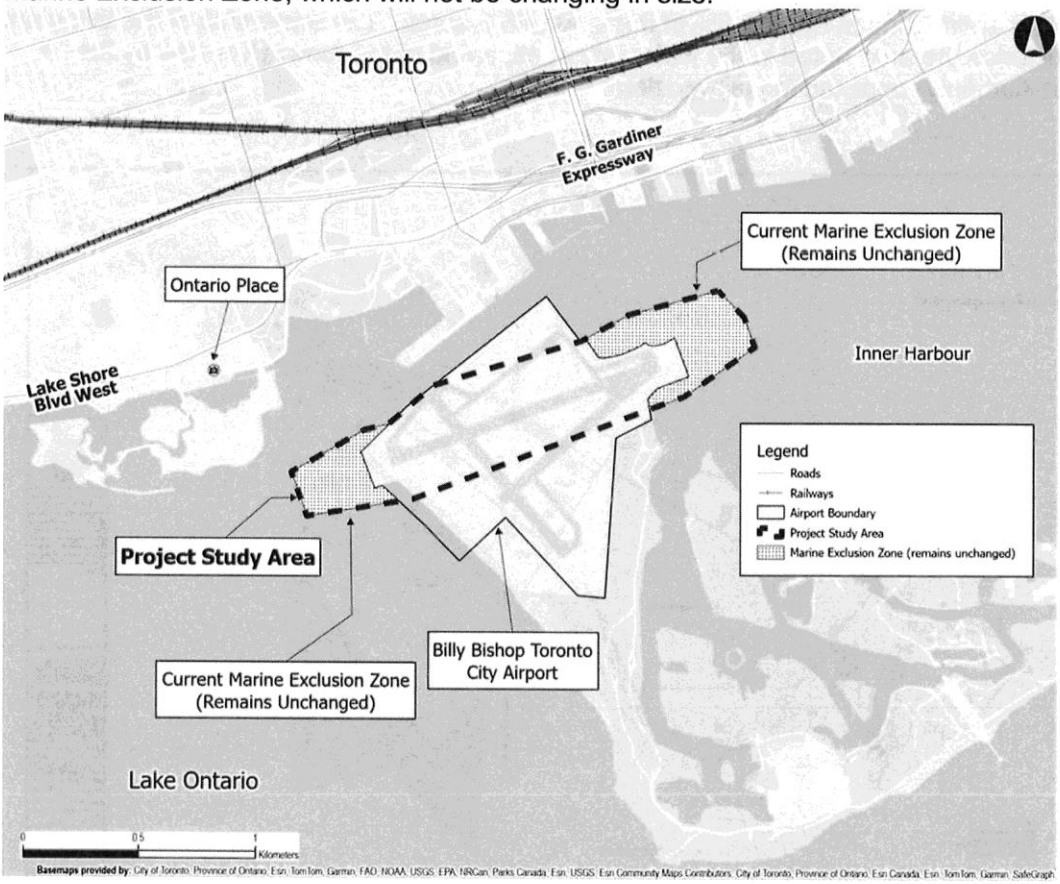
Attachment B – Water Lot Ownership

Billy Bishop Toronto City Airport sits on 210 acres of land on Toronto Island. The Toronto Port Authority owns 78.5% of the land with 165 acres; the City of Toronto owns 20% of the land with 42 acres; and Transport Canada owns 1.5% of the land with 3 acres. The ownership of the lands and water lots includes the area noted in the water lots at each end of the runway (owned by the Toronto Port Authority) depicted in yellow colour.



Attachment C – Project Study Area

The project study area is outlined below and includes the lands and water lot within the Marine Exclusion Zone, which will not be changing in size.



AECOM

Transport Canada

Transport Canada / Transports Canada

4900 Yonge St. 3rd Floor
Toronto ON M2N 6A5

Your file / Votre référence

Our file / Notre référence
5151-1-180
RDIMS Number / Numéro de SGDDI
20421640

VIA EMAIL

July 12, 2024

Warren Askew
Vice President, Airport
PortsToronto
#500 - 207 Queens Quay West,
Toronto, ON M5J 1A7
WAskew@portstoronto.com

Dear Warren Askew,

Thank you for your letter dated June 28, 2024. Transport Canada appreciates the ongoing efforts by PortsToronto to ensure compliance with the *Canadian Aviation Regulations* (CARs), including regulatory obligations related to Runway End Safety Areas (RESA).

Per the letter of June 28, 2024, Billy Bishop Toronto City Airport (BBCTA) confirmed that it handled more than 325,000 passengers (emplaned and deplaned) in both the 2022 and 2023 calendar years. In addition, on July 4, 2024, Statistics Canada published the *Airport Activity Survey*, which provides estimates of passengers emplaned and deplaned at Canadian airports. However, Statistics Canada is prohibited by law from releasing any information it collects which could identify any person, business, or organization. For this reason, the number of passengers emplaned and deplaned at BBCTA was not published.

Consequently, and in accordance with subsection 302.600(4) of the CARs, I am writing to notify PortsToronto that based on information collected by Transport Canada, in partnership with Statistics Canada under the Electronic Collection of Air Transportation Statistics (ECATS) initiative, BBCTA has surpassed the passenger volume threshold during a period of two consecutive calendar years, as set out in subsection 302.600(1) of the CARs. This requires PortsToronto, as the airport owner and operator, to comply with the RESA regulatory requirements within three years of the date of this letter.

Furthermore, in accordance with subsection 302.603 of the CARs, please ensure notification to the Minister of Transport no later than 90 days before the Monday, July 12, 2027, deadline of the manner in which PortsToronto intends to comply with RESA regulatory requirements.

Transport Canada recognizes that RESA implementation at BBCTA is complex. Transport Canada remains committed to working with both PortsToronto and the City of

Toronto to advance a path forward. As part of this effort, I look forward to participating in the community consultation sessions on July 17, 2024, being hosted by PortsToronto.

Finally, as you advance with RESA implementation, please do not hesitate to contact Ovais Mateen, Acting Technical Team Lead Operations Specialties via phone at 416-414-0350 with any questions specific to RESA requirements and/or during preparation of the Plan of Construction Operations.

Kind regards,

MEGeorge

Marcia George
Regional Director
Civil Aviation, Ontario Region

Cc: RJ Steenstra, President and CEO, PortsToronto
Serge Bijimine, Assistant Deputy Minister, Transport Canada
Duwayne Williams, Regional Director General, Transport Canada
Imi Waljee, Acting Regional Director General, Transport Canada
Félix Meunier, Director General Civil Aviation, Transport Canada
Paul Johnson, City Manager, City of Toronto