Transports Canada Transport Canada

December 4, 2025

Mrs. Laurence Piché
Impact Assessment Agency of Canada
901-1550, d'Estimauville Avenue
Quebec (QC), G1J 0C1

Object: Transport Canada's final expert opinion as part of the environmental assessment of the Temiscamingue bridge-dam replacement project in Quebec

Madam,

In response to your request for a final opinion dated August 11, 2025, as part of the environmental assessment of the Timiskaming Dam-Bridge project in the province of Quebec, please find attached Transport Canada's (TC) final opinion.

TC's Regional Navigation Protection Program (PPN) is participating in the analysis of this project and its impacts as the federal department responsible for works involving the protection of navigable waters on which the general public has a right to navigate (Canadian Navigable Waters Act (R.S.C. (1985), c. N-22). As a first step, NPP conducted a preliminary assessment of the project to understand the nature and scope of the activities related to the diversion of water and temporary drying of part of the Ottawa River bed for the construction of a new dam, with the goal of assessing the impact of the work on water control facilities and the associated risks to navigation. Further details are provided in Appendix 1 to this letter.

The Navigable Waters Works Regulations (CRC, c. 1232), also apply to the construction and operation of dams, as well as to the construction of related temporary and permanent structures. In order to comply with these regulations, the owner of water control structures must provide the following additional information:

a) Description of planned debris retention devices or debris chutes crossing or passing over the work;
b) Description of portage trails to facilitate free passage of the public in vehicles or on foot around the structure between the upstream and downstream sections of the Ottawa River;
c) Records of flow (discharge) and water levels upstream and downstream of the work, as well as all plans and other documents relating to navigation required to assess impacts during the construction period and during the operational period of the works;
d) Recurrence periods for channel flow. The frequencies of occurrence of specific flow levels, measured in years and designated by Qx, where "x" represents the number of years between occurrences, shall be presented;
e) Provide the distance of the exclusion zones for the two dams, i.e., the distance upstream and downstream of the structures that boats must not pass if they are to navigate safely. The upstream and downstream exclusion zones for the two dams must be clearly identified on the watercourse;
f) Provide the Minister or his authorized representative with data on water flow in the various channels and passages crossing or passing over the work;
g) Maintain the flow and water level within the limits necessary for navigation in accordance with the Minister's requirements.

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In light of the above information, the attached Appendix 1 provides some answers that may assist in your analysis as part of the environmental assessment of the project.

Gaudette, Catherine

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Catherine Gaudette
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APPENDIX 1 – Responses to questions

1) ***Is the information presented by the proponent on the project in relation to the above areas of expertise adequately and sufficiently described and documented? Please explain your answer and specify, where applicable, any gaps or areas of uncertainty. Explain whether these gaps and uncertainties could influence your opinion and to what extent.***

Assessment of Safe Navigation Conditions

Chapters 3 to 7 and 11 of the impact assessment deal with conditions relating to water control facilities and hydraulic considerations that must be understood in order to fully assess the risks to navigation safety.

In order to assess the navigability thresholds of the Ottawa River, the reference water levels upstream and downstream of the dam must be added to the plans included in the impact study, namely: chart datum (CD) and water levels Q2, Q10, and Q100. The proponent must also document the cumulative effects of the project, including the rise in water levels and flows caused by the presence of temporary structures. The anticipated effects to be taken into account are those necessary to fully assess the risks to navigation safety.

We also noted that the vertical reference level used in the environmental impact assessment for the reference topography and bathymetry (Reference: Chapter 11 – Physical Environment, Section 11.1.10.2 Water Levels) is Niveau Moyen des Mers en mètre S.I. (NMM) or Above Sea Level (ASL) in English. In November 2013, Natural Resources Canada (NRCan) launched the Canadian Geodetic Vertical Datum of 2013, which is now the new standard for elevations across Canada. This new vertical datum replaces the Canadian Geodetic Vertical Datum of 1928 (CGVD28), which was officially adopted by Order in Council in 1935. Add the difference between NMM/ASL and the Canadian Vertical Datum 2013 (CGVD2013) to the plans and tables presented. The concordance between the reference systems can be made using the descriptive data for geodetic points 82L100 and/or 13L1590, which are available via the Ministry of Energy and Natural Resources' mapping portal: Geodetic Network Map.

Plans for associated works such as public utilities like gas pipelines and electrical networks will need to be addressed in the emergency response plan.

2) ***Please specify whether any infrastructure, facilities, activities, or other factors could pose risks related to your areas of expertise. If so, please describe these risks and specify what measures should be put in place to reduce or eliminate them.***

As the water approaches the spillway/dam, the water level is reduced. In general, the depth of flow over the crest of the spillway is at or near the critical depth. This reduces the surface area of the wet section of the flow and therefore increases the velocity. This situation creates a hazard for those navigating the waterway, as the appearance of the water surface often does not indicate this increase in velocity. Some vessels may be unable to exit the high-velocity zone and be drawn into or over the spillway. In addition, the risks are higher for dams that span the entire width of a river, such as the Timiskaming Dam. Often, those navigating the river do not see these dams, as the water flows gently over the dam and blends into the calm water of the river beyond the dam. The dangerous submerged hydraulic jump downstream (also known as the “washing machine” effect), located just below the

facility, is hidden. The plunging flow and hydraulic jump associated with this type of facility make it very difficult, if not impossible, to evacuate the recirculation zone downstream of the dam. Hazardous navigation areas.

The dangerous navigation zone is designated as an exclusion zone. The distance of the exclusion zone is the distance upstream of the notch or dam and downstream of the spillway where vessels must not pass if they are to navigate safely. The Minister may, in his approval, designate an area adjacent to water control structures that is necessary for the safety of persons and navigation. For all purposes related to the approval, the adjacent area may be treated as part of the works.

Although dams sometimes pose hazards to boats navigating reservoirs, these dams are necessary and sometimes provide new opportunities to improve navigation in general. To reduce the risk associated with navigation in navigable waters, mitigation measures can be used to warn boats of hazards or prevent access to hazardous areas upstream and downstream of water control structures. A strategy for the placement of mitigation measures in three areas must be presented in the impact assessment and application submitted to the Navigation Protection Program. Recommendations for its application are based on documentation from the Ontario Ministry of Natural Resources but are also consistent with guidelines from Ontario Power Generation (OPG), the Canadian Dam Association (CDA), the United States Army Corps of Engineers (USACE), and the Federal Energy Regulatory Commission (FERC) in the US. It is important to note that all physical mitigation measures upstream and downstream of water control structures must be maintained in proper condition to ensure safe navigation on the waterway. Faded signs, missing buoys, and debris-laden booms, for example, do not adequately warn vessels of imminent danger.

In order to ensure the effective calculation and definition of the exclusion zone using Transport Canada's guidelines, certain information must be provided in the impact assessment, namely:

- The flow associated with recurrence periods at the spillway or facility (Q2, Q10, and Q100).
- The height of the water above the spillway or facility at reference flows (high water at Q2, Q10, and Q100). These values are obtained by subtracting the elevation of the crest of the spillway or weir from the elevation at the surface of the water in the reservoir.
- The width of the spillway or facility.

Other information useful for applying the safety factor includes:

- Visibility of the spillway or facility from upstream;
- Any narrowing of a river by more than half its width to less than five times the width of the river upstream of the spillway or facility;
- The navigation of motorized pleasure craft on the waterway;
- Navigation of non-motorized pleasure craft on the waterway;
- Any entry point on the waterway located less than one river width from the spillway or facility;
- The direction of prevailing winds;
- The level of danger associated with the spillway or facility for a person colliding with the structure (risk of serious injury, danger of death, etc.);
- Any history of accidents at the spillway or facility site;
- Any planned or current night-time boating or swimming by recreational boaters or swimmers;
- The location and description of any other hazards or structures in the nearby area;
- Detailed information on remote operating procedures at the spillway or facility;

- Access to emergency response services.

Risk mitigation measures for navigation may take the following forms:

1) Warning Signs :

Signs on waterways are intended to inform the public of hazards and must clearly indicate “no entry” areas, hazardous areas, and public space areas. Signs must always be in place to indicate navigability in an area. Two main types of signs should be used near water control facilities: the first to indicate hazardous areas and the second to warn of potential hazards.

Signs direct people away from hazards or allow them to bypass them by guiding them to another location, such as a portage site. Signs must specify the dangerous changes in flow and speed caused by the installation and indicate the presence of visual or audible alerts (sirens, flashing lights, etc.), if applicable.

The size and color of traffic signs and the lettering on them must be appropriate to the severity of the hazard and must be designed so that people can see the signs from the required distance, which is determined by the characteristics of the waterway and the hazardous area. The text must be bilingual, if necessary. Pictograms should supplement the text on the sign and comply with internationally recognized markers.

The precise location of signs near a water control facility depends mainly on site-specific conditions. It is important that signs be visible from outside hazardous areas to prevent people from having to enter the areas solely to read the signs.

The signs must be visible at all times to any vessel approaching the hazardous area. The signs must attract attention by standing out from their environment and should be illuminated if night navigation is common. It may be necessary to move or change signs from time to time in high-traffic areas to prevent public desensitization, as signs often become part of the landscape. For the same reason, although double exposure increases effectiveness, too many signs will contribute to desensitization.

2) Warning Buoys:

Individually anchored buoys serve as floating signs and supplement the existing signage system on the banks of the waterway and at the facility. A series of individually anchored buoys equipped with signs can be used to mark hazardous areas, but they are not as effective as a boom. Buoys must be made of non-corrosive material and must protrude above the water surface for visibility and maintenance purposes. Buoys must comply with the Private Buoy Regulations (Canada Shipping Act, 2001 – S.C. 2001, c. 26) and Transport Canada guidelines.

3) Upstream/Downstream Safety Booms:

Barriers provide a visual warning of the dangerous area and serve as physical obstacles to attempts to cross, thus blocking access to the water. This is why booms are preferred to buoys in highly dangerous areas. Barriers serve as a complement to warning signs and should not be used in isolation. Booms and other barriers also promote self-rescue by allowing stranded boaters and swimmers to use the barrier cable to reach shore; this is not possible with buoys. All booms installed on navigable waters must be approved under the Canadian Navigable Waters Act (R.S.C. 1985, c. N-22).

It is recommended that safety booms be installed primarily in the following areas (based on the ACB guidelines for public safety):

- Upstream of surface drains;
- Upstream of sluice gates and cofferdams;
- At the entrance of intake channels, especially those with steep slopes and side walls;
- Downstream of submerged hydraulic jumps where dangerous currents are created.

4) Alarm or Warning Devices:

Alarm or warning devices, usually sirens or strobe lights, are used to warn the public of dangers when it is not feasible or possible to install appropriate physical barriers, particularly in the case of remotely or automatically controlled sluice gates. Alarm devices must be activated sufficiently in advance of the dangerous change in river conditions to allow the public to leave the area.

Sirens and strobe lights must be accompanied by signage explaining the meaning of the alarms and how to respond to them. Alarm devices must cover the entire extent of the hazardous area, which may require the use of several interconnected devices. The design of an alarm device must provide a level of redundancy proportionate to the hazard posed by the facility. An emergency plan must also be in place in case an alarm device is out of service.

5) Considerations Related to Carrying or Transporting Boats:

Signs and barriers should be used to discourage canoeists and kayakers from passing over or approaching water control structures. Providing an alternative route, such as a portage road that bypasses the hazardous area, is one way to discourage this practice. Portaging is not the preferred way to bypass a hydraulic structure, but few options may be available if it is not safe to navigate the structure.

Portage sites must be adequately marked. Portage routes must include a safe landing site well upstream of the hazard, as well as another symmetrical landing site downstream of the hazard posed by the hydraulic jump. It is recommended that both sites be located more than twice the distance of

the exclusion zones upstream and downstream of the dams. These sites should also never be within the exclusion zones of the spillway (i.e., never downstream of the safety booms in the exclusion zone) or upstream of the exclusion zones of the hydraulic jump.

The landing sites must be clearly visible from the surrounding areas, and appropriate signage must be in place to direct boaters to the sites. Landing areas must be made of a material suitable for the riverbed, with sand preferred to rocks, and must be large enough (at least 10m x 20m) to allow boaters to launch a canoe, kayak, or motorboat, disembark passengers, and unload equipment for portaging or towing. Furthermore, the slope of the landing area must be less than 1:3, ideally between 1:3 and 1:12.

The trail/road connecting the upstream and downstream sites is just as important as other portage considerations. The trail/road must be easily passable. Factors to consider when assessing the suitability of the trail/road include the distance between the upstream and downstream landings, the gradient, the width, the soil materials, the protection of adjacent environmental areas from erosion, local drainage, fall protection, and the distance from the hydraulic facility.

In the case of portage routes crossing a highway, PSPC must take into account the following aspects and considerations:

- Road classes and road design parameters;
- Appropriate signage sufficiently far in advance to allow enough time to reach the landing area;
- Visibility of the site and the portage trail;
- The materials of the streambed (for example, a sandy bottom rather than rocks);
- A clear area sufficient for pulling out reference canoes, kayaks and motorboats, unloading equipment and preparing for portaging or towing the boat;
- Access to emergency response services.

6) Public Safety Incident Management

An incident involving trespassing could occur where there is a risk of exposure to potentially dangerous situations or an inadequate public safety prevention measure (e.g., a damaged safety boom used to block access to certain areas around a dam). In most cases, public safety incidents arise because the public has ignored or failed to notice warning signs about trespassing on Public Services and Procurement Canada (PSPC) property or in waterways (e.g., when a boater or angler is in the waterway downstream of a dam). In such cases, PSPC will take appropriate steps to address the issues, such as contacting and providing information to police and local authorities. It is possible that PSPC may not have full control over certain aspects of public safety (such as when the public disregards warning signs or barriers and gets too close to dams), but it is important that PSPC continue to be diligent in taking action to ensure that such problems do not reoccur.

Admittedly, safety practices vary from dam to dam depending on site-specific risk assessments. Furthermore, dams sometimes require measures such as detection beacons or alarm systems. That said, it is important that PSPC continues to review and assess the adequacy of the processes implemented at this dam, particularly given its easy public access.

To protect this dam and the public, PSPC should:

- Conduct dam inspections and reviews promptly, in accordance with policies and best practices, to assess their safety and operation;

- Continue to review the security processes of its assets to raise public awareness and discern opportunities to implement other security measures, such as security beacons or alarm systems where possible

It is important to maintain a rigorous dam safety program. Public safety remains the top priority of the Navigation Protection Program, which includes the safe operation of dams. Public Services and Procurement Canada (PSPC) must ensure compliance with all applicable dam safety regulations and actively participate in local forums aimed at enhancing safety in this area. We advise PSPC to implement a dam safety review process to ensure timely accountability and to maintain ongoing assessments of the control measures in place to protect the public from water-related hazards. PSPC should also collaborate with local authorities, law enforcement agencies, and community stakeholders to raise public awareness of dam hazards and their recognition, thereby strengthening public safety in Ontario and Quebec. It is recommended to continue multi-platform water safety awareness campaigns, which vary from season to season, and target outdoor enthusiasts and anglers.

7) Debris and Remains of the Dam 1909-1934 :

According to the environmental assessment, shoals (observable at an altitude of approximately 173 m NMM) corresponding to the remains of the old dam (1909-1934) and several large concrete blocks of one meter as well as various types of metals/debris are still present at the bottom of the river in this area (Mistras , 2016) (Figure 11.13).

PSPC will need to document the effects of the dam's reconstruction and the relocation of the remains of the 1901-1934 dam. Identify the measures planned to remove or stabilize the debris to prevent their displacement during the operation of the new dam.

3) ***Please provide your opinion on the protective measures, preliminary emergency response protocols, or preliminary emergency response plans proposed by the sponsor. Are they adequate and sufficient to reduce the risk of accidents or failures or their consequences? Please explain your answer and suggest alternative measures, if applicable.***

Water Retention Management Plan (Operations)

The prepared water retention management plan must be submitted to the Navigation Protection Program considering that the work requires the operation of dam discharge devices during flood periods and considering that the level of consequences of a dam failure is considered significant.

This plan must describe the measures that will be taken by the owner to manage the retained waters safely, particularly in situations that could compromise the safety of people, property and navigation on the Ottawa River and the St. Lawrence River.

The water retention management plan must include:

- The maximum level of exploitation;
- The level corresponding to the safety flood;
- The evacuation curve;
- The storage curve;
- The strategy for communicating risks to the people concerned and to the authorities responsible for civil security.

A management plan is required before the new dam can be put into operation.

This plan must be kept up to date with the navigation protection program and a summary of this plan must be sent to the local municipalities where the dam is located.

Emergency Response Plan (Operations)

An emergency response plan must be developed for each dam whose potential consequences are considered medium, significant, very significant, or considerable. This plan aims to establish the measures to be taken in the event of an actual or imminent dam failure in order to protect people and property located, with few exceptions, downstream of the dam, or to mitigate the effects of the failure. It includes, among other things:

- An inventory of situations likely to cause a breakdown;
- A general description of the flooded area;
- Alert procedures and flood maps related to dam failure.

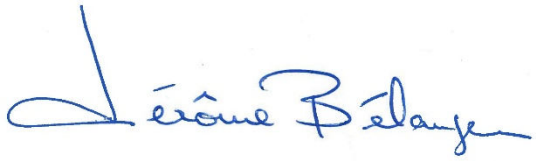
The preliminary emergency response plan required under the Act for existing dams may be acceptable. However, a final plan is required before the dam is put into operation. This plan must be kept up to date, and a summary of it must be provided to the local municipality where the dam is located. Transport Canada must be notified of this transmission. It is the responsibility of the dam owner to ensure the implementation of these plans.

4) ***Among the measures proposed to reduce the risks of accidents and failures or their consequences, please identify those you consider key [1]. Please suggest corrective actions (if necessary) or recommend any other measures you deem essential that have not been proposed by the sponsor.***

The key measures proposed to reduce the risks of accidents and failures, or their consequences are detailed in points 2 and 3.

5) ***Does Transport Canada have any concerns about the potential environmental effects [2]on the project (e.g., the effect of water level regulations on navigation, the impacts of a potential dam failure on marine infrastructure and navigation, etc.)? If so, please explain your concerns and identify any gaps or areas of uncertainty.***

Concerns regarding the potential environmental effects on the project are detailed in point 3.



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[1] Key measures: The essential mitigation measures to avoid or mitigate environmental effects and which could be transformed into conditions under the CEAA, 2012.

[2] For the purposes of the LCÉE (2012), the environment is defined as the set of natural conditions and elements of the Earth.