

EXECUTIVE SUMMARY

Stantec Consulting Ltd. (Stantec) was retained by the New Brunswick Power Corporation (NB Power) to conduct a Comparative Environmental Review (CER) of potential Options being considered for the Mactaquac Generating Station (the Station), a 670 MW hydroelectric generating station located on the Saint John River approximately 19 km upstream of Fredericton, New Brunswick. The Station has been in service since 1968.

What's the Issue, and What are the Options?

Current modelling indicates that the Station is experiencing a premature end to its service life as a result of an alkali-aggregate reaction within the Station's existing concrete structures that is causing the concrete to expand. The Mactaquac Project (the Project) consists of an evaluation of three potential "end-of-life" Options being considered by NB Power to address the future of the Station at the end of its service life in 2030 (the Options):

- Option 1, Repowering: Refurbish the Station by constructing a new powerhouse, spillway, and other components, followed by the removal of the existing concrete structures at the Station;
- Option 2, Retain the Headpond (No Power Generation): Build a new concrete spillway and maintain the dam as a water control structure without power generation, followed by the removal of the existing concrete structures at the Station; or
- Option 3, River Restoration: Remove the Station and enable the river to return to a free-flowing state.

Additionally, a fourth option, "Life Achievement" is described in Appendix A.

NB Power is continuing to review the projected 2030 end of service life for the Station. That work includes exploring ways to continue operations within the current footprint beyond 2030. NB Power did not initially include these potential approaches for continuing operations within the current footprint, collectively referred to as the Life Achievement Option, in the CER process because they had not yet been determined to be technically or economically feasible. Since that time, recent modelling and engineering have shown that, despite an ongoing growth of the concrete due to AAR, known issues may be able to be mitigated with extensive ongoing maintenance, repair or refurbishment. The results of studies suggest that it may be possible to maintain or partially refurbish the existing Station components to extend their life beyond 2030 and may be able to achieve the original intended 100-year service life of the Station (*i.e.*, to the year 2068).

What is the CER?

The results of the CER are documented in this Final CER Report. The CER provides a means to better understand the environmental, social, and socio-economic issues that could arise from each of the Options. The CER is a high-level evaluation of the likely ways that each of the Options may interact with, or affect, the surrounding environment. It also provides a means by which potential mitigation measures can be identified at an early planning stage to make each Option environmentally

acceptable. The information collected as part of the CER will be considered by NB Power, along with other information, in its decision-making regarding the Station.

The CER is not part of a formal regulatory process, but is part of the planning process to assist in the selection of a Preferred Option. Depending on the Preferred Option chosen, there is expected to be a requirement for a provincial environmental impact assessment (EIA) and possibly the need for a federal EIA/EA. Various other permitting and approval processes would likely be required prior to it proceeding. In this regard, the CER is seen as an integral part of the scoping and planning of any future EIA/EA for the Preferred Option, once it has been selected.

What does the CER Conclude?

In this report, the Options are evaluated to determine if activities would interact with thirteen valued components (VCs), which were selected specifically to highlight the environmental attributes of the region, in consideration of standard mitigation. If a particular Option is determined to interact highly with a particular VC, additional mitigation or other measures to further reduce changes to the VC may be identified. Recommendations for further information, data collection, and analysis are also provided, as well as assumptions and limitations of the evaluation.

Overall, the CER Report demonstrates that all three end-of-life Options as well as the Life Achievement Option have both positive and negative attributes from an environmental and social standpoint. It is clear, however, that any Option selected by NB Power will require careful planning, management, and execution to achieve acceptable environmental results and enhance positive attributes.

The CER Report is an integral part of the early planning process to assist NB Power in its decision making regarding the Station and to consider environmental, social and economic opportunities and constraints. It will be important for NB Power to continue this ongoing planning, consultation, issues management, and mitigation so that whatever Option is ultimately selected is carried out in a progressive, systematic, and environmentally responsible manner.