

November 22, 2023

N1L4-0150 and W2014L4-0004

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Wek' èezhii Land and Water Board
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Snare Hydroelectric Facility – Water Licence Renewal, File No. W2023L4-0001

Good day,

The Northwest Territories Power Corporation (NTPC) owns and operates the Snare Hydroelectric Facility (the Facility) located on the Snare River, approximately 145 km northwest of Yellowknife, NT. The facility includes four hydro generation stations; Snare Rapids, Snare Falls, Snare Cascades and Snare Forks, that together are the main source of power for the north slave electrical system which includes the communities of Yellowknife, Behchokò, Dettah and N'Dilo.

The facility is regulated by two Type A Water Licences (WL) held with the Wek'èezhii Land and Water Board (WLWB) that regulate the storage and diversion of water for hydroelectric generation for the site.

On July 10, 2023 NTPC submitted an application to renew the two Type A Water Licences for the Facility. Please find attached NTPC's Response to the interventions for renewal of Water Licence W2023L4-0001 submitted by the Tłıchq Government (TG), Government of the Northwest Territories Department of Environment and Climate Change (GNWT-ECC), and Fisheries and Oceans Canada (DFO).

This submission also considers the documents provided throughout the application process, including the application package, Response to Public Review, Technical Session and Information Request (IR) responses.

NTPC thanks all intervenors for their engagement in this Water Licence renewal and we look forward to building upon the relationships established through this process.

Sincerely,



David Dewar
Director, Health, Safety, & Environment
Northwest Territories Power Corporation

22 November 2023

Mason Mantla, Chair
Wek'èezhii Land and Water Board
4922-48th Street, Yellowknife
via email to kdefrancis@wlwb.ca

Response to Interventions
Snare Hydroelectric Facility Water Licence Renewal, File No. W2023L4-0001

This letter to the Wek'èezhii Land and Water Board (WLWB) from the Northwest Territories Power Corporation (NTPC) is the Response to Interventions for Water Licence W2023L4-0001 for the Snare Hydroelectric Facility. NTPC has read and considered the Interventions provided by the Tlicho Government (TG), Government of the Northwest Territories Department of Environment and Climate Change (GNWT-ECC), and Fisheries and Oceans Canada (DFO). This submission also considers the documents provided throughout the application process, including the application package, Response to Public Review, Technical Session and Information Request (IR) responses.

For clarity of cross-referencing, NTPC has repeated the Recommendation provided by the Intervenors prior to each Response, in the order in which they appear in the Intervention and grouped by Intervenor. Recommendation numbers were assigned by NTPC if not provided in the Intervention.

GNWT-ECC Recommendations and NTPC Responses

GNWT-ECC-1

Recommendation: GNWT-ECC recommends that the term of the renewed Type A Licence be 25 years at most in accordance with the Waters Act.

Response: NTPC has reviewed the intervention and considers the submissions of GNWT-ECC to be legal argument on the maximum term of licence issue. The Work Plan permits NTPC the right as applicant to make final closing argument – this step is currently scheduled for February 15, 2024. At that time, NTPC will provide its response to GNWT-ECC on legal matters in respect of the maximum term of the License. In the event the draft conditions of the licence relate to the maximum term, NTPC will respond as provided for in the Work Plan.

GNWT-ECC-2

Recommendation: GNWT-ECC recommends NTPC explain the operational limitations that must be considered by NTPC, while also minimizing potential impacts to the environment with regards to the proposed dates or duration which it would recommend to limit drawdown of Big Spruce Reservoir and the Snare Falls Forebay to the proposed lower limits.

Response: NTPC has proposed to change the lower water level limits for Snare Rapids Forebay (on Bigspruce Reservoir) and Snare Falls Forebay. The rationale for these changes is different at these two sites and is explained below for each.

Snare Rapids Forebay

To re-iterate the response provided in the Response to Information Requests from the Technical Session (submitted on October 5, 2023), NTPC proposes a temporary change to the lower limit of the Snare Rapids Forebay from 217.9 metres (715 feet) to 217.6 metres (714 feet) from April 15 to August 15, triggered only in years when inflows are below 70.43 cubic metres per second on the preceding September 1 and following notification to the Board through the quarterly SNP report for June-September. If inflows are above 70.43 cubic metres per second, the lower limits would remain at 217.9 metres.

The rationale for this change is to make additional water available during low-water years for hydroelectric generation during years when inflow to the reservoir during the preceding spring and summer has been insufficient to fill the reservoir and support demand for electricity throughout the winter months.

NTPC provides the following supporting background with regards to operational limitations and environmental impacts:

- In low-water years, the currently licenced water level leads to the avoidable use of diesel-generated electricity. NTPC can avoid this diesel-generated electricity with the flexibility to operate closer to the minimum water level of 217.9 metres in the Water Licence without fear of Licence violation due to wind or wave action. This change to the minimum water level will act as a contingency to provide additional flexibility to prioritize additional hydroelectric generation and reduce greenhouse gas emissions caused by the diesel alternative.
- NTPC has observed a possible increase in frequency of low-water years, meaning that NTPC would otherwise have to apply for temporary exemptions to Snare Rapids Forebay levels more frequently if the requested change is not approved.
- The requested change to the lower limit leads to lower generating efficiency and as such is not a preferred scenario. However, it is a contingency to avoid the unnecessary use of diesel generators.
- NTPC's proposal to notify the Board and Inspector through the quarterly SNP reports provides public notice long before the alternate minimum levels are triggered. This allows sufficient time for interested parties to submit questions or

recommend additional mitigations based on the environmental conditions before the drawdown occurs.

- NTPC commissioned a study in 2014 that evaluated the impacts of reducing the water level by 0.3 metres (1 foot). The study concluded that the impacts to the aquatic environment were negligible, and that the alternative of increasing the water levels in the reservoir would have a larger impact by diminishing flows to the downstream environment (summarized in the Environmental Studies Summary and Screening Level Environmental Assessment, submitted with the application).

Snare Falls Forebay

To re-iterate the response provided in the Response to Information Requests from the Technical Session, NTPC proposes a temporary change to the lower limit of the Snare Falls Forebay from 201.8 metres (662 feet) to 201.5 metres (661 feet) for a maximum of 14 days in a continual period and between May 1 and October 31.

The rationale for this request is that NTPC has found it difficult to maintain water at the approved elevation during maintenance.

NTPC provides the following supporting background with regards to operational limitations and environmental impacts.

- Currently, the lower limit of the Snare Falls Forebay is the same as the elevation of the gate where water enters the Snare Falls generating plant (201.8 metres, NTPC Datum). Water must be lowered to this level for gate inspections. However, as there is no buffer between the gate level and the water licence limit, wave or wind action causes water levels to drop below the Licenced level. NTPC is requesting a buffer be included in the Licence to account for these environmental conditions and measurement errors that otherwise lead to inadvertent and unavoidable Licence violations.
- Fish stranding in the Snare Falls Forebay is avoided by slow and gradual draw-down by running more water through the Snare Falls generator than is received from inflows. Further, the proposed short duration and seasonality of the proposed change does not coincide with spawning and rearing of fall-spawning fish.
- NTPC refers also to the document entitled “Environmental Studies and Screening-Level Environmental Assessment”, provided with the application, which provides additional information on the environmental impacts of the proposed low water levels.

GNWT-ECC-3

Recommendation: GNWT-ECC recommends the Water Licence require a report from the Septic Field Verification Study be submitted for Board approval.

Response: NTPC agrees with this recommendation from GNWT-ECC and supports inclusion of a Water Licence condition for submission of a final Septic Field Verification Study Report.

GNWT-ECC-4

Recommendation: GNWT-ECC recommends the Water Licence require the submission of a Geochemical Characterization and Management Plan, for Board approval, at least 90 days prior to use of quarry rock as construction material. GNWT-ECC notes this submission should not be constrained by a distance from a waterbody where construction material will be used.

Response: NTPC agrees with this recommendation.

GNWT-ECC-5

Recommendation: GNWT-ECC recommends the Water Licence include the Standard Water Licence Conditions Part E Conditions 5 and 8.

Response: NTPC agrees with this recommendation.

GNWT-ECC-6

Recommendation: GNWT-ECC recommends the Water Licence require the submission of all plans requiring revisions, for Board approval, post-issuance of the Water Licence.

Response: NTPC agrees with this recommendation.

GNWT-ECC-7

Recommendation: GNWT-ECC recommends the Water Licence include a condition requiring the submission of an interim CRP within a timeframe determined by the Board, in advance of any closure and reclamation, including progressive reclamation or temporary closure.

Response: NTPC agrees with this recommendation.

Tłı̄chǫ Government Recommendations and NTPC Responses

TG-1

Recommendation: The TG supports the proposed amendments to lower the Snare Rapids and Snare Falls minimum water levels if fish and fish habitat are protected.

Response: NTPC thanks TG for the support and the feedback provided through this process.

TG-2

Recommendation: The Board may wish to consider a Licence requirement that NTPC maintain the dam crests to design elevations at all times.

Response: NTPC maintains a dam safety program to monitor and address deficiencies at its dams and spillways, as already required by Water Licence. Crest settlement is monitored through regular crest surveys as outlined in NTPC's Dam Safety Program (Section 22) and OMS Manual (Section 4.4). Maintenance is completed as required as part of the dam safety program and reported in Water Licence Annual Reports. NTPC is confident that the various conditions in the draft licence already require regular inspection of dams and maintenance of their integrity, through Part E Conditions 1 and 2, 9 and Part F Conditions 3, 13, 14, 15, 16.

TG-3

Recommendation: The Board should consider whether a Licence condition(s) is needed to require a freeboard analysis, review of the inflow design floods, and verification of erosion protection

Response: These items are considered through the dam safety review process which NTPC is required by the water license to complete in compliance with the Dam Safety Guidelines (Part F Condition 15 of the draft Licence). NTPC is currently completing a Probable Maximum Flood Study to review freeboard adequacy and inflow design flood(s). The outcome of this study will update inflow design flood values for dams at Snare Hydro and may suggest the need for modifications or dam raises. NTPC commits to providing this Study and NTPC's proposed response to the Board. Further, this Study will be received by Review Engineer(s) of the ongoing Dam Safety Review for Snare, the recommendations of which will also be provided to the Board.

TG-4

Recommendation: The TG recommends that the definition of dam safety engineer focus on dam safety.

Response: NTPC proposes the following alternate definition:

Dam Safety Engineer: A qualified professional engineer whose role is to ensure all dams and related hydraulic structures are maintained and operated in a manner that minimizes risks to public safety, the environment, and NTPC Operations.

TG-5

Recommendation: We recommend that the Licence include a requirement to periodically (e.g., every 10 years) submit a report on how climate change has or is predicted to affect a) environmental impacts of the Snare Hydroelectric Facility and b) the efficacy of the Licence conditions.

Response: NTPC shares TG concerns regarding the future effects of climate change. NTPC considers such effects in the operation of hydroelectric power generation in the Northwest Territories into the future.

Exploring options to improve the provision of clean and reliable electricity is undertaken by the GNWT Department of Infrastructure, Energy and Strategic Initiatives Division, which is tasked with planning an energy system that anticipates climate change while reducing the greenhouse gas emissions that cause climate change.

NTPC is of the opinion that the mechanisms currently included in the Water Licence and other regulatory processes are adequate to address TG's concerns. For example:

- Apparent changes to water level patterns was considered when developing the Water Licence application, including the range of water levels and the possible change in the cycle of low-water years. This has led to the NTPC request for changes to water levels at the Snare Rapids Forebay, triggered by low inflows.
- The Licence contains provisions for Annual Engineering Inspections and regular third-party Dam Safety Reviews.
- The Water Licence also requires that NTPC provide Surveillance Network Program reports four times per year, Reservoir Operation Reports twice per year, and Water Licence reports annually, offering transparency and multiple opportunities for public review of water management at the Snare Hydroelectric Facility.
- NTPC is committed to continue to work with Fisheries and Oceans Canada (DFO) to understand potential risks to fish from the operation of the facility and to identify mitigation solutions that minimize or eliminate risks, and this process will be formally initiated through a submission of a DFO Request for Review.

NTPC is therefore confident that the Water Licence conditions and schedules, as currently proposed, not only provide the envisioned opportunity for review of operations in response to climate change, but already consider the possible range of future conditions that may occur as a result of climate change. The requested additional reporting would be a duplication of work already underway and work without the clear feedback-loops already embedded in the permitting processes for the Licence and approvals from Fisheries and Oceans Canada.

DFO Recommendations and NTPC Responses

DFO-1

Recommendation: Understanding the effects to fish and fish habitat in the outflows of BigSpruce Reservoir and operations of the facilities is important to maintaining the health of the fishery. BigSpruce and Lake Strutt likely provides essential spawning, migration, and residence habitat to fish that inhabit both lakes.

Response: NTPC provided the available information on the fisheries in the Bigspruce and Strutt Lake areas with the water licence application.

DFO-2

Recommendation: DFO will be requesting that NTPC submit a Request for Review to DFO as part of our Regulatory review process. The information provided in the water license renewal application and the Request for Review form will help DFO determine if a Fisheries Act Authorization is required. This process can occur independent of the Water License Renewal process.

Response: NTPC agrees to submit a Request for Review for the proposed reduction in minimum water levels. The Request for Review application will summarize information provided with the water licence application.

DFO-3

Recommendation: DFO recommends that NTPC continue to work with DFO to complete an assessment to determine the death of fish and HADD, which can occur independently of the Water License Renewal, which may require an authorization under the Fisheries Act. Should an Authorization be required, the Proponent will need to submit an application for a Fisheries Act authorization

Response: NPTC is committed to continue to work with DFO to understand potential risks to fish from the operation of the facility.

DFO-4

Recommendation: The minimum water level reduction proposed should only occur when absolutely necessary and not within the timing windows to protect littoral zone habitat and fish spawning areas. The operational plan should include a regular maintenance schedule for cleaning of trash racks to mitigate impingement and death of fish. Planned shutdowns should occur gradually to mitigate the effects of stranding, with pulse flows.

Response:

As stated above, NTPC agrees to submit a Request for Review for the proposed reduction in minimum water levels. NTPC would like to reiterate that the minimum water level reduction would only be applied in extreme cases where drought has the potential to threaten Bigspruce reservoir storage and the generation of electricity. The use of the minimum water level would be infrequent, and any effects to fish and fish habitat from operations during an extreme drought year would be negligible in magnitude.

Furthermore, sensitive timing windows would be avoided, to the extent it is practical to do so. It is highly unlikely that the application of the revised minimum water level would overlap with peak spawning and rearing periods for fall spawning salmonids, such as Lake Trout. Although the use of the revised minimum water level may occur in early spring, potentially overlapping with the spring spawning period for some fish species in the Snare River system, the use of the revised minimum water level and subsequent release of flow, has the potential to augment downstream flows during drought conditions, ultimately benefiting downstream fish populations.

NTPC will continue to work cooperatively with DFO on these issues, including impingement and entrainment, we thank DFO for the guidance provided to date. The Operations, Maintenance and Surveillance Manual will be updated to include a regular maintenance schedule for cleaning of installed trash racks at intake locations and planned shutdown schedules will be designed to occur gradually to mitigate the effects of stranding, with pulse flows.

DFO-5

Recommendation: DFO and NTPC have been working cooperatively for many years at some of their existing facilities. Both parties recognize the importance of protecting fish and fish habitat. NTPC continues to address DFO concerns and implement appropriate measures to ensure compliance with the Fisheries Act

Response: NTPC will continue to work cooperatively with DFO, and thanks DFO for the guidance provided to date.

Closure

NTPC has found the water licence application process thus far to be collaborative and positive, with the shared goal of maximizing renewable power from the Snare Hydroelectric Facility, while protecting the Snare River aquatic environment and traditional use of the area. NTPC appreciates this opportunity to comment on the Interventions and provides these responses in the same spirit to assist the WLWB in preparing the Licence. NTPC looks forward to continued collaboration with these parties and the WLWB in our shared goal of protecting the environment while providing renewable energy to residents of the Northwest Territories.

Should any additional information be required, please do not hesitate to contact me.

Sincerely,

David Dewar
Director, Health, Safety & Environment
Northwest Territories Power Corporation