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20 July 2022

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Re: Alouette Headworks and Surge Tower Seismic Upgrade Project: Reservoir Management Options

Thank you for the opportunity to review the Reservoir Management Options Report ("the Report"). Specific comments are contained in the attached document at the end of this letter.

The report, like the previous reporting during the multi-party meeting held at the City of Maple Ridge Library on the 13 September 2019, relies primarily on existing and anecdotal information. This is particularly disappointing in that ARMS, and others, identified several data shortcomings and key issues at that session that required additional data. BC Hydro has lost valuable time over the past almost three years where important data could have been collected leading to better informed analyses.

The Alouette River has been the home for all five Pacific salmon species for millennia until the Alouette Dam and the diversion structure were built and put into operation nearly a century ago. Today they continue to struggle to survive, including the Sockeye which have been recommended by COSEWIC to the federal government (pending). ARMS and others have been working relentlessly to save the salmon and get fish passage around the dam for decades. Not only has BC Hydro been a largely reluctant partner, some parts of the company, including this project, have operated in a way that shows little regard for the protection and restoration of the salmon. One example is the failure to even suggest augmenting river flows to maintain the licensed flows which will not be met by the Low-Level Outlet Gate when the reservoir is drawn down to permit the construction work. Allowing the flows to be reduced by over 30% without proposing to offset those flow reductions is unconscionable.

Another major shortcoming is that report only focusses on the tunnel project. While this may fit BC Hydro's major project planning and implementation structure it totally fails to even mention that the impacts to the watershed are going to occur for several more years when the Alouette Dam seismic upgrades occur. ARMS has consistently advocated for taking a holistic approach to managing the Alouette watershed, but BC Hydro continues to silo their approach and projects.

Further, while the report occasionally suggests there may be some environmental mitigation options available the report does not indicate how the options can be implemented and how that would reduce the impacts. The result would be a more informative report for assessing the options, especially the residual impacts.

There is no mention of possible compensation BC Hydro is considering to offset or account for the residual impacts. It is obvious that many impacts are unavoidable, but the document is silent. It does not even indicate the BC Hydro is willing to consider compensation.

For some issues, such as Pelagic Productivity, the report suggests studies that could be conducted to ascertain more accurately the real impacts. However, there is no commitment from BC Hydro in the report

to conduct these studies. This lack of commitment to truly understand the consequences of the project's impacts is concerning but not overly surprising based on the history of the project failing to conduct any impact assessments to date.

Despite ARMS raising the issue at the 2019 meeting and in several forums since, the treatment of public safety is lacking especially as it relates to flooding downstream of the Alouette Dam. As witnessed most recently in November 2021 the South Alouette River is highly volatile and subject to flooding even when the tunnel and dam are in service. The "options assessment" report however casts doubts on whether reactivating the tunnel is feasible. It states on page 8 of the report:

"In addition, if required in an emergency, the tunnel may be recalled (i.e., for large or prolonged storm events) additional modelling would be needed to determine the likelihood of increased river flow requirements during draw-down, or whether returning the tunnel to service during draw-down events would be practical or feasible in either Option 1 or 3."

Has BC Hydro developed 'large or prolonged storm events' response plans for each of the options, including how the tunnel could be reactivated? If so, will BC Hydro share these plans with the City of Maple Ridge and more importantly, the residents living downstream? An additional 56 cms of flow in the river could prove devastating. The residents living on the river, those who must cross the river to access their homes and the extensive transient users deserve that BC Hydro be totally transparent in developing and publicly sharing this component of their public safety plan. The City of Maple Ridge deserves a better and more responsible account from BC Hydro on this matter.

BC Hydro has flood protection requirements in its operating permission from the Province which are the result of the Water Use Planning process to alter the operating parameters of the reservoir to help mitigate the potential impacts of large inflow events. These, as we witnessed most recently in November 2021, are limited in their effectiveness. Having the tunnel out of service during at least a portion of the high-risk period deserves a dedicated and determined evaluation of how to minimize the risk and the transparency to share it with the public and the City.

Further, the treatment of public safety on the reservoir when the reservoir is drawn down is wanting. Alouette Reservoir is one of the most heavily used water bodies in the Lower Mainland and yet there is no acknowledgement that at lower reservoir levels the risk of interactions or collisions of the various powered and self-propelled watercraft will increase. There are no safety protocols or measures identified. There is also no mitigation identified for the related impacts such as upgrading the boat ramps to enable users to safely access the reservoir when the levels are lowered.

The treatment of the river recreation is inadequately addressed too.

As it stands the report fails to provide adequate information on which to make an informed decision for which of the operating options would be preferred.

Sincerely,



Ken Stewart
President, Alouette River Management Society

CC:
Katie First Nation Chief and Council
Justin Laslo, Leq'á:mel First Nation
Karen Popoff, BC Hydro
Joyce Murray, Minister of Fisheries, Oceans, and the Canadian Coast Guard

Rebecca Reid, DFO Regional Director General, Pacific Region
John Horgan, Premier
Marc Dalton, MP Pitt Meadows-Maple Ridge
George Heyman, Minister of Environment and Climate Change Strategy
Lisa Beare, MLA Maple Ridge-Pitt Meadows, and Minister for Citizen Services
Bob D'eith, MLA Maple Ridge-Mission
City of Maple Ridge Mayor and Council
City of Pitt Meadows Mayor and Council
Dan Sneep, DFO Fisheries Protection Program
Dr. Marvin Rosenau, BCIT Rivers Institute
Dr. Ken Ashley, BCIT Rivers Institute
Shannon Harris, Ministry of Environment and Climate Change Strategy

Comments on Alouette Headworks and Surge Tower Seismic Upgrade Project: Reservoir Management Options

Specific Comments

1. Introduction, paragraph 1. - The purpose of this project is misrepresenting the true function of the tunnel. Its purpose is to divert some 94% of Alouette watershed flows into the Stave watershed to generate electricity. It is true that having the ability to divert up to 56 cms into the Stave watershed can mitigate the impact of a flood event BC Hydro has steadfastly refused to declare that their facilities are for flood management even though the current approved and permitted operation includes flood buffering operations of the reservoir and the tunnel. The danger caused the way the paragraph is worded is that people who do not understand the natural functioning of the watershed can be lulled into believing that BC Hydro can protect those living or temporarily visiting downstream of the Alouette from the effects of a flood event. In fact, one could suggest that the City of Maple Ridge has fallen into this trap in the manner that it has not only allowed but encouraged residential development along the river. During this project, the flooding risk on the South Alouette River is increased.
2. Table 1 - As currently presented does not include some of the critical information when comparing the options. One example is for Option 1 the table does not indicate the reservoir level drops to 116 metres at the end of September. There is still plenty of boating occurring on the reservoir into the autumn. The table should convey all the key information included in the accompanying text.
3. Section 3.1 - There is no mention or assessment of the river flood risks to either private property or the river recreational users. The Alouette watershed has long been a gathering place for people recreating, picnicking during the summer. Potential flows of up to 43 cms are not expected and ill-informed users could be at risk. The river has also become popular among tubers in the summer. These people come from all over the Lower Mainland, and many would not know the river well enough to recognize the difference between 10 cms and 43 cms and could unknowingly try tubing in what could be dangerous conditions with their inexpensive tubes.
4. Section 4.1 Fertilizer Program - This section does not address the potential effect of applying fertilizer to the reservoir that contains much less water volume than the application was designed for. Are there potential issues with too much fertilizer, by volume or concentration in the water, being added? There is no acknowledgement of the current situation resulting from the November 2021 storms that caused damage to the access road and other infrastructure. The project could be a positive by investing in the necessary access road repairs this fiscal and calendar year.
5. Section 4.2 Littoral Productivity - Is there a cumulative impact on littoral productivity for options 2 and 3 when the reservoir is drawn down in successive years?
6. Section 4.5 Water Temperature - The document states the water being diverted through the tunnel would come from the South basin of the Alouette Reservoir. The diversion tunnel is located near the North end of the North basin and upstream of the outlet of the reservoir. As we understand, the tunnel will be used to lower the reservoir to the target levels and then the elevation would be maintained by evacuating water with the LLOG or with pumps and siphons (depending on the option). How would the majority of the water (and nutrients and fish) come from the South basin? This needs to be explained better.
7. Section 4.5 Water Temperature - Is it possible with options 2 and 3 (year 1) that with the drawdown occurring in July and August that the smaller surface area and reservoir depth that the epilimnion could warm faster and more? Which layer is the LLOG intake? Which layer would the pump or siphon intake be located?

8. Section 4.7 Tributary Access for Spawning - Please review this page as there are some wording anomalies. This issue is one where the project has an opportunity to invest some money in at least monitoring what is happening during the project with respect to access to tributaries.
9. Section 4.8 Fish Entrainment - The last sentence of the Issue description should be part of the Impact section. It has been a long and difficult journey for primarily ARMS to finally get BC Hydro to do an entrainment study. In fact, this project is the likely motivator for BC Hydro to finally initiate the work. A related factor is the entrainment of nutrients, phytoplankton, zooplankton, and more in the 94% of the inflows that are diverted into the Stave watershed. In an ultra-oligotrophic watershed this degree of loss of nutrients, despite the fertilization program must have a significant effect. Although out of scope for this impact report doing the entrainment study during the construction period only would not properly inform the community of the entrainment that occurs during the regular operation. The altered operation and the disruption around the tunnel intake are going to modify the behaviour of the fish. Thus, the entrainment study needs to be continued well after the project is completed and returned to normal operation. Is there any data on the type of entrainment that occurs with the use of pumps and siphons? These units have been used for many years in many locations.
10. Section 4.8 Fish Entrainment - Given the entrainment study is incomplete, what design changes to the project are being considered if mitigation is needed?
11. Section 4.9 Terrestrial Wildlife and Vegetation -This section is very weak. While the author is somewhat correct in stating that the terrain and maturity of much of the vegetative cover is not highly conducive to extensive populations of wildlife there are many animals that use the area around the reservoir. And some of these will use the reservoir for watering, etc. even though there are many creeks and rivers. Species that are generally considered prey species, such as deer, rodents, etc. have a limited tolerance to being in open, exposed areas where they are generally more vulnerable. Changing the operations, especially in the hot summer months when many of the previously mentioned streams are dry may cause the animals to have to venture further from the protective forest cover to water etc. Is there any data on the use of the reservoir by eagles or osprey for nesting? A change in operation could affect their ability to fish and feed their young. The potential for impacts is much more extensive than suggested by this information sheet and deserves a better effort to understand the real level of wildlife presence and use and the potential impacts. Monitoring during the project is essential.
12. Section 4.10 Archaeology - Reservoir - Compared with the environmental sections this information sheet is quite lightweight in its dealing with the history, traditional use, and cultural importance of the area for the Indigenous peoples. Admittedly much of the information is necessary to protect but BC Hydro's approach to the issue comes across as laissez faire.
13. Section 4.11 Recreational Opportunities and Public Safety - Reservoir - The public safety risks are not broached at all in this section. For example: what is the potential increase in risk to boater hitting debris on the reservoir bottom that may be exposed at the lower reservoir elevations; and when the reservoir level is reduced so is the surface area and with the increased user activity the risk of accidents can increase and how would this be managed or mitigated (control user access, impose power craft speed limits, etc.).
14. Section 5.1 Water Temperature - River - This 'textbook' assessment of the potential impacts of increased water temperature is disappointing. We are dealing with a run of Sockeye salmon that is endangered and other salmon species that are also under duress. The tone of the document is basically indifferent to the condition of the Sockeye. Further it fails to address the fact that this is a multi-year impact which could impact several years of runs. Also, in 2021 the river temperature was recorded in excess of 20 Celcius which could be a situation that repeats in the future in which case a 3 - 5 Celcius increase when the adults are returning to spawn could be devastating. BC Hydro is a member of the Committee working to restore the salmon runs in the Alouette and yet this report is so passive in its treatment of the potential impacts to the salmon and resident fish species. Even as a simple step to protect their financial investment in the Alouette fishery one would expect an

impact report to be both focused on the impacts and the potential actions to be taken to avoid or mitigate.

- 15.** Section 5.2 Total Dissolved Gas (TDG) - The report states the possible increase in TDG from the siphon and/or pumping can be managed during monitoring. But it does not explain how. The report also says there is no mitigation option. These two statements are incongruent and leave the reader with the feeling that nothing is going to be done.
- 16.** Sections 5.3, 5.4 & 5.5 Habitat Availability - It is difficult to assess the potential effects when terms like “prolonged high flows” and “for extended periods” are used with no definition of these terms. And these terms need to be defined to some degree for the specific waterway in question. Further please be consistent in the LLOG flows - in most of the document the numbers used are 2.7 cms and 1.8 cms but in Section 5.4 the numbers used are approximately 3 cms and 2 cms. Once again, this assessment is reading like an introductory university course in fish biology and clearly demonstrates that little or no field assessment has been done. The data that does exist dates back to the early 2000s which may be acceptable as there have not been any major changes to the river from inflow events or human activity. However, it does convey to the reader that BC Hydro is not really taking the environmental effects of this project (and the subsequent dam safety work) seriously.
- 17.** Section 5.6 Fish Stranding - Although ramping rates are dictated for the Alouette spillway control gate in the 2009 Alouette WUP addendums to BC Hydro’s water right licence there is clearly evidence that in some cases after high river flows stranding still occurred. BC Hydro clearly recognized this as a deficiency in their operation of the spill gate ramp down rates as the gate was being closed. Consequently, BC Hydro in their 2010 application to DFO for a Section 35-2 HADD for, entrainment in the tunnel, also included the Alouette spill-gate, river ramp-down “stranding” issue. It was to be assumed by ARMS, and others with concern for this watershed, that as DFO, MOE and BC Hydro came together and signed this legal DFO document, which was contingent on a A-S WUPOR in 2014, they would move immediately to address the stranding and entrainment issues, addressed in the DFO HADD, and have a full report ready for the 2014 A-S WUPOR. However as of 2022 the planned 2014 WUP review has not occurred and with this Section 35-2 HADD, issued to BC Hydro, which was contingent on this 2014 A—S WUPOR review is still unaddressed. This outstanding legal document, signed by Corino Salomi on behalf of DFO, co-signed by MOE, and BC Hydro is still approved Under the Canadian Fisheries Act to conduct work or undertaking that will cause the harmful alteration, disruption, or destruction (HADD) still authorized by DFO. ARMS believes this to be a contravention of the intent of this Sect. 35-2 HADD, as a means of BC Hydro finding a resolution to their HADD issues in the Alouette watershed in a timely manner. This outstanding harmful assault on the fish in the Alouette watershed is potentially now to be compounded by further harmful flow events. Having monitoring and recovery teams in place when these flow events occur would be the minimum to be expected.
- 18.** Section 5.7 Terrestrial Wildlife and Vegetation - River - This section, like for the reservoir, is pretty light in science. The reality is much of the potential impact is unknown because when previous large flow events occurred no one was assessing the wildlife impacts. Consequently, one would expect a comprehensive monitoring program and a meaningful response.
- 19.** Section 5.8 Hatchery Operations/Sockeye Trap and Truck Program - The potential for serious impacts, at least for Option 1, to negatively affect the ALLCO hatchery operation and trap and truck program exists. The simple statement that no mitigation options exist sends the message that the Sockeye population in the South Alouette River is dispensable. This is a sad statement.