Jan 24th, 2023

To: Impact Assessment Agency of Canada

RE: Draft analysis of proposed changes to Woodfibre LNG project decision statement conditions:

I am writing to state my firm opposition toward Woodfibre LNG's proposed amendments to its environmental assessment certificate, specifically their proposal to amend Condition 3.8, regarding the protection of marine mammals. I am a PhD Candidate at the University of British Columbia studying human impacts on marine ecosystems, with a research focus on marine ecological recovery in Átl'ka7tsem/Howe Sound. For the past seven years I have worked with regional non-profits, governments, and First Nations on marine conservation, restoration, and spatial planning projects in Átl'ka7tsem. Thus, I am in a qualified position to evaluate the proposed amendment's effects on marine ecological recovery in Átl'ka7tsem/Howe Sound.

My inability to support Woodfibre LNG (hereafter WFLNG)'s proposed amendment to Condition 3.8 stems from three main concerns: (i) insufficient scientific support toward WFLNG's proposed amendment; (ii) failure of WFLNG to demonstrate best practices in alignment with UN standards; and (iii) the timing of this amendment review occurring prior to the launch of federal guiding principles around underwater noise (i.e., Canada's Ocean Noise Strategy). Until these three concerns are addressed, the IAAC's approval of WFLNG's proposed amendments will risk being perceived as disjointed from science-based decision-making and could further undermine public trust in government- decision-making processes, already at concerningly low levels in Canada (Salomons and Hoberg, 2014).

Here I elaborate to support my three concerns.

First, scientific evidence suggests that when underwater noise levels generated by impulsive sound sources (e.g., pile driving) exceed 160 decibels (dB), a 125-m pinniped-specific exclusion area, as proposed in this amendment, **will not** protect pinnipeds from permanent hearing damage. Measurements of the effects of pile driving on pinnipeds, specifically harbour seals, demonstrate that 100% of seals that approach within **7km** of pile driving activities experience temporary and/or permanent threshold shifts (Whyte et al., 2020). In a separate study, 60% of seals that approached within 10km of pile driving activities experienced underwater noise levels associated with causing **permanent** threshold shifts (Hastie et al., 2015). I share research about harbour seals because, being phocid pinnipeds, they have the lowest onset-thresholds for temporary and permanent threshold shifts out of all marine mammal groups (i.e., they are the most sensitive), and, as noted in WFLNG's amendment letter, they are year-round pinnipeds within Átl'ka7tsem/Howe Sound (Kastak and Schusterman, 1998; Southall et al., 2019). Thus, they are a suitable species to inform conservative underwater noise impact plans. **These peer-reviewed studies suggest that a 125-m exclusion zone is entirely insufficient to protect against detrimental and adverse impacts to pinnipeds**

caused by impulsive underwater sound sources. Rather, they support the retention of the original 'marine mammal underwater noise impact area' wording in Condition 3.8.

My concern about the lack of scientific support toward WFLNG's proposed amendment is amplified by the fact that WFLNG does not cite recent scientific evidence about the impact of underwater noise on pinnipeds to justify their proposed changes. Rather, they rely on the model used in their original application (created between 2013-2015) to defend their injury-distance thresholds of 73m for pinnipeds, and reference other permitted industrial projects to support the 125-m exclusion area selection. This suggests that WFLNG is making decisions based on old science and industry precedents rather than on the best available knowledge about ecological impacts of underwater noise. **The study of underwater noise is a rapidly evolving scientific field and thus regulatory decisions must reference recent research.**

In addition, WFLNG point out that pinnipeds can behaviourally avoid underwater noise by exiting the water; however, they fail to describe that aerial impulsive noise thresholds are even lower than underwater thresholds for both seals and sea lions: onset aerial noise thresholds for temporary and permanent threshold shifts (TTS and PTS) in phocid pinnipeds (i.e., seals) are 123-138 dB and 138-144 dB and for sea lions the ranges are 146-161 and 161-167 dB for TTS and PTS respectively (Southall et al., 2019). **Data on aerial noise impacts is currently absent from WFLNG's proposed amendment and should be incorporated to provide a comprehensive review of this project's potential ecological effects on pinnipeds.**

My second concern relates to the apparent divergence between WFLNG's proposed amendments with best practices, as outlined by the United Nations, the National Oceanic and Atmospheric Association (NOAA), and the scientific community. The recent designation of Átl'ka7tsem/Howe Sound as a UNESCO Biosphere Region reflects the region's commitment toward biodiversity conservation, reconciliation, and sustainable development. This designation means that large industrial projects within the Biosphere region may be profiled on a global platform as examples of sustainable development. **I am concerned that WFLNG's proposed amendments do not meet these standards and could undermine the Biosphere's designation and perceived legitimacy**.

To elaborate: WFLNG's proposed amendment to Condition 3.8 runs counter to the precautionary principle and ecosystem-based management (EBM) because: (i) they propose to split their required mitigation measures into two groups of marine mammals (pinnipeds and cetaceans), and (ii) they further reduce the safe-guard measures for pinnipeds. This conflicts with EBM and fails to uphold the highest environmental standards for pinniped protection. Moreover, the focus on underwater noise impacts to marine mammals described by this letter and in the associated environmental assessment process fails to account for the impact of underwater noise on non-marine mammal species in the region, including fish and their critical habitat. The shoreline around and within the Woodfibre certified project area includes some of the most important herring spawning habitat

within Átl'ka7tsem/Howe Sound (van Oostdam et al., 2023). Herring have only recently begun to return to spawn in moderate abundance within the northern region of the Sound over the past few years after a multidecadal absence. This species is culturally significant to the Skwxú7mesh Úxwumixw (Squamish Nation) and a foundation species within the Átl'ka7tsem/Howe Sound marine foodweb. Herring are sensitive to sound, and coastal First Nations in British Columbia, such as the Kitasoo/Xais'xais, have Indigenous laws that prohibit disruptive behaviours and noises around spawning sites (De Robertis and Handegard, 2013; Kitasoo/Xais'xais, 2020; McKechnie et al., 2014). **To adequately account for the full ecological impact of industrial projects, environmental assessments should describe the ecological impacts of underwater noise generated by projects on fish as well as marine mammals. The WFLNG amendment letter should also include maps of herring spawning distribution within its appendix.**

The reduction and omission of important animal groups suggested in this proposed amendment undermine the ability for WFLNG, and the federal government, to demonstrate ecosystem-based management, which is critical for industry operating within a Biosphere. To quote from a recent paper published by NOAA scientists:

> "The business case for EBM is founded on the assertions that economic profitability for the private sector (and spin-offs and tax revenues) will decline if ocean resources are over-exploited over time, that non-market benefits derived from ecosystem services are usually inadequately accounted for in [business-as-usual] analyses and that non-market and social benefits under [business-as-usual] will erode as the public recognizes deteriorating ocean conditions." (Link et al., 2019)

This statement underscores the fact that industry does not operate in a silo. The precarious ecological recovery of Átl'ka7tsem after decades of industrial degradation must be protected by and for all stakeholders and rightsholders in the region. This is even more central considering the growth of eco-based economic activities, including the rec-tech industry and tourism, which comprise a substantial portion of the region's economic revenue and rely upon healthy marine ecosystems (Miller, 2020). **Thus, the IAAC must contextualize this proposed amendment within an understanding of the cumulative effects of industry throughout Átl'ka7tsem/Howe Sound Biosphere on ocean-based ecological, social, cultural, and economic values.**

My final concern is that the timing of the IAAC's review of WFLNG's proposed amendment to Condition 3.8, including this public comment period, falls before the launch of Canada's Ocean Noise Strategy, a critical federal document that provides guiding recommendations for national underwater noise standards. This report was anticipated to have been published in 2022 but is now anticipated to be launched in the next few months. Ensuring that this proposed amendment about underwater noise impacts is guided by federal policy is critical to demonstrate transparent and consistent decision-making by federal review boards for industry stakeholders, public stakeholders and rightsholders, and affected ecosystems. The public commentary review period will likely close

prior to the strategy's dissemination, which means public who comment are uncertain about alignment (or lack thereof) between this proposed amendment and federal policy**. I strongly recommend the IAAC ensure that their decision-making is guided by the strategy's recommendations. Failure to do so could reduce public trust in federal decision-making processes** (Salomons and Hoberg, 2014).

In summary, I have reviewed that I cannot support the proposed amendment to Condition 3.8 by WFLNG because of: (i) insufficient scientific support to justify the reduced distance of the pinniped-exclusion zone; (ii) divergence between the proposed amendment and best practices associated with the region's status as a UNESCO Biosphere; and (iii) uncertain alignment between the proposed amendment and federal guiding policy. I appreciate the IAAC's consideration of this research and my perspective as you review this proposal.

Sincerely,

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[1] This letter expresses my individual perspective and does not represent views or opinions of either organization that I am affiliated with