

August 23, 2022

Government of Nunavut
Community and Government Services
P.O. Box 379
Pond Inlet, Nunavut
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RE: NWB Sampling Criteria for Kimmirut

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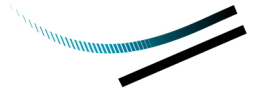
Dillon has reviewed the sampling criteria outlined in Part D of the Kimmirut wastewater lagoon water licence. The purpose of effluent sampling is for performance reporting and to ensure due diligence relative to the licensee meeting the effluent criteria. Currently, the proposed maximum effluent parameters for faecal coliforms is 1×10^4 CFU/100mL at stations KIM-3 and KIM-5.

Based on Dillon's preliminary design of the new Kimmirut lagoon, even with extensive modifications, the chosen wastewater treatment system (lagoon + wetland) cannot achieve the proposed 1×10^4 CFU/100mL effluent faecal coliform limit consistently or reliably. A faecal coliform limit of this magnitude is more consistent with a mechanical wastewater treatment system which includes an effluent disinfection step (ultraviolet light, or chlorination/dechlorination).

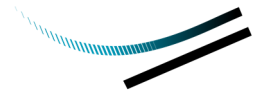
Effluent disinfection is typically established by regulating authorities to achieve a recreational use quality in the receiving water, or to protect a sensitive ecosystem component such as seashell harvesting. Application of a 1×10^4 CFU/100mL effluent faecal coliform limit at Kimmirut may be overly conservative, and push the community to install a more costly treatment approach.

Respectfully, we request the 1×10^4 CFU/100mL faecal coliform requirement be reconsidered and rescinded based on the following:

- There are currently no regulations in Nunavut with respect to faecal coliforms from domestic wastewater sources.
- The Kimmirut foreshore and receiving environment have been used for wastewater disposal for decades without any noticeable impairment impact to the public health or to the environment. The Kimmirut public is well aware of this disposal practice and know to avoid the area. Signage can be erected to reduce public risk.



- The proposed lagoon/wetland treatment system was selected based on the parameters identified in the federal WSER regulations (CBOD and TSS), which does not include an effluent faecal coliform limit.
- E. Coli (faecal coliform) generally follows federal guidelines: Health Canada's *Guidelines for Canadian Recreational Water Quality*, and *Canadian Shellfish Sanitation Program*
- Health Canada's Recreational Water Quality Guidelines recommend faecal coliform limitations for primary contact, such as swimming and for secondary contact, such as boating.
- Neither primary nor secondary contact occurs in this Kimmirut foreshore or receiving/mixing area.
- With respect to the Canadian Shellfish Sanitation Program, there is no commercial shell fishing in Kimmirut although concerns may remain for causal shell fishing where the catch is eaten raw. The consumption of raw shellfish does not occur from this area in Kimmirut.
- The 1992 NWT Guidelines is often used in Nunavut to aid in the development of licences. These guidelines do not specify faecal coliform limits for marine environments; however, note (g) to Table 4.1 states: "... in the case of an open, well flushed bay or fjord, bacteriological standards will be of concern only where the discharge might affect a fishery (including shellfish harvesting) or water contact recreation...".
- It is understood that the Kimmirut marine environment is subject to strong tidal flushing, increasing mixing and minimizing contact risk.
- The 2017 GNWT Good Engineering Practice guidelines recommend the Canada-Wide Strategy for the Management of Municipal Wastewater Effluent as guidance, cautioning that, "... this may not be practical for all systems and a customized approach may be needed...". This guideline does not recommend an E. Coli or faecal coliform performance target and remains silent on this point.
- The Canada-Wide Strategy for the Management of Municipal Wastewater Effluent, and Wastewater Systems Effluent Regulation, do not apply in Nunavut.



- The difficulties of collection and transport of faecal coliform samples from Kimmirut to an accredited laboratory will likely impact the accuracy of analytical results.
- Sample collection will need to consider sampling methods; successive grab samples from the same location with a lagoon often result in a wide range of values. Composite sampling would be recommended if this effluent limit is upheld, further affecting project costs, logistics, and ongoing operational costs.
- The cost to adapt the wastewater treatment strategy at Kimmirut to achieve effluent disinfection would be high and impractical relative to the proposed lagoon+wetland system. The ongoing operation and maintenance of a mechanical treatment alternative would pose a challenge to this small community, including the associated operator training, certification, and retention.

Conclusion

Based on the above concerns, we respectfully request that the NWB reconsider the application of a bacteriological effluent criteria at Kimmirut. It does not appear to be associated with any regulatory drivers, and will impose hardship on the community if a mechanical wastewater treatment solution is needed. Alternatively, discussion around an effluent standard that is achievable relative to a lagoon+wetland system would be welcome.

Sincerely,

DILLON CONSULTING LIMITED

Keith Barnes, P.Eng.
Project Manager

Our file: 20-2790