

Northern Division
Environmental Protection Branch
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Our File: 4782 029

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Re: Municipality of Arctic Bay - Application for a New Water Licence - NWT3ARC

I have reviewed the above application and supporting materials on behalf of Environment Canada (EC) and offer the following comments:

Firstly, Environment Canada supports the initiative to improve treatment of the community's sewage by upgrading the facility. The proposed incorporation of a wetlands component will enhance effluent quality prior to entering Arctic Bay.

Several specific concerns with the proposed sewage treatment upgrading have been identified:

- The proposed work does not include any remediation of the existing lagoon. When an EC Inspector visited the facility this summer, it was apparent that sewage was simply flowing through the lagoon with no retention, so based on his observations, the estimate of 30 day retention is highly optimistic. EC recommends that upgrades to the primary treatment lagoon be undertaken to optimize the open-water treatment and retention.
- The Dillon Consulting Ltd. Final Report document did not show the discharge corridor for melted sewage to flow into the downstream wetland system as stated at the bottom of page 6. Presumably this would be at a topographical low point which drains to the first ponding berm? The document refers to placing the ponding berms following an examination of the site for "field fit". EC recommends that as a contingency, there should be provision in the design for diversion berms along the west margin of the drainage, to prevent pooling of effluent in any depressions which may lie to the west. We want to avoid any standing water occurring.
- It must be ensured that ponding of the water behind the berms does not cause the underlying permafrost to melt and result in thermal erosion occurring. The likelihood of this will depend on substrate composition and stability. Elsewhere, problems have arisen on tundra terrain where water ponding in a new area changed the thermal conditions enough that melting of the permafrost occurred, and soils washed out with the water flow.
- The re-routing of the drainage channels along the east side of the wetlands area must be done with care; the new drainage route along the berm may require proper engineering (e.g. a swale lined with insulating rock) to prevent thermal erosion from occurring.

- Armouring of the berm with rock of sufficient size to withstand freshet flows must be done where ever the drainage channels will intersect the berm. Figure 4 only specifies native coarse materials to be used, and these will be subject to erosion unless they include appropriately sized rocks.
- Will the sewage be diverted to another location during the construction of the wetlands area?

With respect to the other licenced activities, EC makes the following standard recommendations:

- While it sounds like the solid waste site is being well-managed, installation of a perimeter fence should be done.
- An Operations and Maintenance Plan should be developed.
- A spill contingency plan should be devised, and stocks of appropriate clean-up response materials held.
- Environment Canada encourages the community to pursue opportunities to recycle materials.
- A Surveillance Network Program will need to be developed. EC recommends the stations include the dump leachate (analyzed annually for a full suite of parameters) and open-water season sampling of the lagoon discharge plus the wetlands runoff at the culverts leading to Arctic Bay (or any other discrete stream at the end of the wetlands), for pH, BOD, TSS, ammonia, bacteriological, and metals.
- Monthly visual inspections of the treatment area for erosion are recommended for at least the first two years post-construction.

Please do not hesitate to contact me at (867) 669-4735 with any questions or comments regarding the foregoing.

Yours truly,

Anne Wilson
Water Pollution Specialist

cc: Steve Harbicht (Head, Assessment & Monitoring, EPB)
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Wade Comin (Inspector, EPB Iqaluit)