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Northwest Territories Water Board
Box 1500
Yellowknife, NWT X1A 2R3

Attention: D. Nickerson, Chairman

Dear Sir:

RE: LETTER OF DECEMBER 1, 1993 TO MR. E. GORDILLO, P.ENG. ON SEWAGE DISPOSAL IMPROVEMENTS IN GRISE FIORD, NWT.

We are responding to your letter on behalf of Mr. Gordillo to address the concerns raised in your review of the "Design and Operations Concept" report. We appreciate your feedback on the information in the report, and we feel that this dialogue will enhance the overall success of the project.

We will endeavour to address the concerns in your report on an item by item basis.

1. Receiving environment

The location of the community of Grise Fiord at the head of Grise Fiord was the basis for suggesting that the receiving environment be considered an "open coastline." The reference to "the bay" in Appendix C should be corrected to read "the ocean."

The relatively shallow slope of the ocean floor may be reason to consider Grise Fiord in the context of a bay or fiord, and therefore reduce the wastewater effluent quality guidelines presented in the report. The effluent quality guidelines would be reduced for the values of BOD_5 (100 mg/L versus 360 mg/L) and suspended solids (120 mg/L versus 360 mg/L). The remainder of the values would remain the same in accordance with the "Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories."

2. Seepage storage lagoon

The consideration of a seepage storage lagoon was based upon the performance of the existing lagoon system in Grise Fiord. The existing lagoons discharge by effluent seepage through the dyke. It was recognized that the existing lagoons do not at present provide sufficient seepage to drain the lagoons during the limited summer season. Therefore the recommended configuration incorporates a very large seepage face, as well as a piped discharge system to accommodate the eventual blinding of the seepage face.

The ultimate design of the facility will be dependent upon a detailed review by a geotechnical engineer of the construction materials available in Grise Fiord.

3. Land treatment aspect

The seepage discharge from the lagoon will maintain the existing overland flow regime as outlined in the report. This is not an engineered land/wetland application, but rather an existing condition which may enhance the lagoon discharge. This additional treatment is incidental to the location of the lagoon.

The effluent quality expected from the lagoon itself, as presented in the report, will be well below the effluent quality guidelines in the NWT Water Board Guidelines.

4. Pictorial presentation

The proposed lagoon system was presented in the report using an air photo, in addition to site plan, cross sections, and detail sketches. This level of detail is appropriate for the this stage of the project.

Photos of the area were presented as part of an Inspection Report, which was submitted separately from the preliminary report. A copy of this report may be obtained from Mr. Gordillo.

5. Berm slope

The sideslope reduction is based upon the geotechnical considerations presented in the Appendix of the report. As presented in the report, any slope reduction would ultimately depend upon the friction angle of the soil, and the degree of saturation of the dyke.

The ultimate design of the facility will be dependent upon a detailed review by a geotechnical engineer of the construction materials available in Grise Fiord.

6. Abandonment and restoration plan

The decommissioning information presented in the report on the existing lagoons is of sufficient detail for this stage of the project. A regulatory comment on the use of one of the existing cells as a municipal waste disposal area, and the other as a honey bag cell would be useful.

The information presented in the report addresses a means of removing and disposing of the existing liquid from the existing lagoons, filling the existing lagoons, capping, and minimizing the infiltration of moisture into the decommissioned lagoons. As stated in the report, any infiltration into the decommissioned lagoons will eventually seep into the proposed lagoon for retention and treatment. It is anticipated that the sludge in the lagoon will remain permanently frozen.

7. Snow accumulation

Snow accumulation in the bagged sewage area may or may not be a problem, however any leachate generated by excess moisture would seep through the fill into the proposed sewage lagoon.

We hope this information addresses your comments. If there are any further questions please direct them to Mr. Kevin Ness, P.Eng. at 920-4004.

Sincerely,

UMA Engineering Ltd.

Ken Johnson, M.A.Sc., P.Eng.
Environmental Engineer

cc
Kevin Ness, UMA
Eddie Gordillo, DPWS

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