



Water Resources Division
Resource Management Directorate
Nunavut Regional Office
P.O. Box 100
Iqaluit, NU, X0A 0H0

Your file - Votre référence
3BM-GRI1520

September 14, 2020

Our file - Notre référence
CIDM#1288145

Robin Ikkutisluk
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
sent via email: licensing@nwb-oen.ca

Re: Crown-Indigenous Relations and Northern Affairs Canada's comments on the Hamlet of Grise Fiord's renewal application for water licence #3BM-GRI1520 for municipal undertakings – Hamlet of Grise Fiord

Dear Ms. Ikkutisluk,

Thank you for your August 14, 2020 invitation for technical review comments on the above referenced application. The Water Resources Division of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the application and the results of our review are provided in the enclosed memorandum for the Nunavut Water Board's consideration.

Comments have been provided pursuant to CIRNAC's mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*. If there are any questions or concerns, please contact me at (867) 975-3876 or by e-mail at sarah.forte@canada.ca or Godwin Okonkwo at (867) 975-4550 or godwin.okonkwo@canada.ca.

Sincerely,

Sarah Forté
Water Management Specialist

Technical Review Memorandum

To: Robin Ikkutisluk, Licensing Administrator, Nunavut Water Board

From: Sarah Forté, Water Management Specialist, Water Resources Division, CIRNAC

Date: September 14, 2020

Re: Crown-Indigenous Relations and Northern Affairs Canada's comments on the Hamlet of Grise Fiord's renewal application for water licence #3BM-GRI1520 for municipal undertakings – Hamlet of Grise Fiord

Region: ☐ Kitikmeot ☐ Kivalliq ☒ Qikiqtani

A. BACKGROUND

On August 14, 2020, the Nunavut Water Board provided notification of the Hamlet of Grise Fiord's submission of a renewal application for their Type B water licence 3BM-GRI1520 for the use of water and deposit of waste in the Hamlet of Grise Fiord. Government of Nunavut – Community and Government Services (GN-CGS) submitted the application on behalf of the hamlet.

The Hamlet's water source is a glacier fed stream passing through the community. The water intake is installed in a pond / ditch, which was last re-excavated in 2018. During the 2 months of the year when there is flow, water is drawn to fill two water storage tanks. One of the storage tanks is in need of repair. A water treatment plant/truck fill station is located next to the tanks.

The community's sewage is also trucked, and treated in a single cell lagoon approximately 800 m west of the community. The lagoon is decanted once a year. The solid waste facility is co-located with the sewage lagoon. Presently a consultant is working on a waste audit and feasibility study to improve or replace the current solid waste facility.

The hamlet is requesting for a 5-year renewal with authorization to use 8 000 m³/year of water and all the same facilities as are authorized under the present licence.

B. RESULTS OF REVIEW

On behalf of CIRNAC Water Resources, the following comments and recommendations are provided for the Board's consideration:

1. Water sources

Comment

The application requests authorization to withdraw 8 000 m³/year from the same source as the current licence, a glacial meltwater stream running through the hamlet.

The Hydrology Assessment submitted with the application states "*As Grise Fiord glacier and the existing watershed are the current sources of potable water for the community, the lack of development for the alternative water source presents a potentially serious issue for the long term supply of fresh water for this municipality.*" This echoes the Review of Sustainability of Nunavut's Drinking Water Sources that identifies Grise Fiord as having moderate risk for water shortage threat level based on median water availability estimates, and medium risk when considering 50-year return period minimums.

A potential secondary water source, 300 m away from the storage tanks is mentioned in the document Water Supply in Grise Fiord. It has also been the subject of discussions with the CIRNAC inspector, as summarized a letter to GN-CGS. The secondary water source under consideration is identified as Airport River and has not yet been certified by public health authorities.

Recommendation

CIRNAC recommends considering adding the Airport River as a secondary water source to a renewed licence because of the water shortage risks identified with the current water source.

2. Management of solid waste facility

Comment

Concerns over the solid waste facility in Grise Fiord have been raised by CIRNAC Inspectors without perceptible improvements. An example from 2017 is:

- a) *The Solid Waste Facility (SWF) is once again found to be unsatisfactory condition to the inspector.*
- b) *Issues on site are as follows;*
 - i. *No attempt to control windblown litter.*
 - ii. *Barrels of hazardous waste do not appear to be segregated or stored in such a manner as to prevent the deposit of deleterious substances into any Water. See figure 3 to 5 for examples of unsegregated hazardous waste.*
 - iii. *Culverts and ditches up gradient of the facility divert water directly through the SWF instead of around the SWF. See figure 6 for a photo of a water management structure diverting water into the municipal refuse.*
 - iv. *Barrels of Hazardous material were found to be leaking on to the ground at the time of the inspection. This is to be cleaned up as soon as possible and remediated as set out in the solid waste operations and maintenance plan.*

c) While reviewing the solid waste operations and maintenance plan provided to the Nunavut Water Board in 2014, it was noted that:

- i. The Licensee is not using the site highlighted as the “metal Dump site” in Fig-2: Site Locations of the Water licensed Facilities on page 6 of the solid waste operations and maintenance plan.
- ii. The hazardous waste is not kept separate from each other or stored in a way to prevent the mixing of these materials as stated as “imperative” in section 6.2, page 14 of the solid waste operations and maintenance plan.
- iii. The solid waste operations and maintenance plan states that the hazardous waste will be stored up to 5 years. This unsegregated waste has been identified in the past by inspector A. Keim, in a 2006 inspection report he stated “Inspection of the Solid Waste Management area found little or no segregation of materials. Three areas containing Drums of waste materials were noted (approx. 100 drums)”. There is now over 400 barrels of unknown hazardous waste being stored in this unlined facility with no apparent segregation from municipal refuse.

d) The inspector is requesting that this facility be inspected by an engineer in order to develop a plan to; segregate hazardous waste, remove hazardous waste from the site, and divert water away from this facility.

Current operations are unsatisfactory, and as noted by the Inspector in 2017, the Solidwaste Operation and Maintenance (O&M) Plan is not being followed. CIRNAC notes several deficiencies in the plan which might contribute to difficulties in following the plan. Specifically:

- Page3, Section 1.0: The introduction seems to have been copied from the Sanikiluaq O&M Plan because of the location described and population numbers. The reader therefore does not know if the facilities described (domestic waste dump site of 43 560 m² and metal waste site of 3 422 m²) are in Grise Fiord.
- Page 6, Figure 2: The cartoon sketch of the facilities includes unlabelled features, such as a purple square and a red oval, and it differs from the cartoon sketch provided in Figure 2 of the O&M Manual for the Existing Sewage Lagoon. The figure does not indicate where hazardous materials are to be stored.
- Page 12, Section 5.1.3.3; page 15, Section 6.2: There is no indication of a hazardous waste storage site, so it is confusing to instruct operators to use such facilities.
- Page 17, Section 6.2.1 covers some of the steps necessary to set up a hazardous waste storage area, though it omits the necessity of having secondary containment. CIRNAC did not find any reference to the Hazardous Waste Management Procedure.
- Page 22, Section 7.3: Like the introduction, this section would be relevant for the Sanikiluaq landfill. It reads: “At present, there is fence that prevents the migration of windblown debris out of the MSW disposal area”, and “Signs were installed at the Monitoring stations at SAN-2 and SAN-4”. Inspector findings include no fencing (2014, 2017) and a monitoring station sign GRI-2 (2018).
- Page 23, Table 2: The coordinates of the sampling stations are incorrect, they are in Sanikiluaq.
- Page 29, Section 10.3: The distribution list for the O&M Plan is outdated, as many of the people listed no longer work for the respective organizations, and it does not contain any contact information.

Part F, Item 3 of the current licence requires the submission of an updated Hazardous Water Management Procedure” within 3 months of licence issuance. CIRNAC did not locate an updated version of the Procedure.

The renewal application does not contain any commitment to improving conditions at the landfill. Instead, the Executive Summary states a waste audit and feasibility study of the waste management site is being worked on. This would be followed by design, building and commissioning of a new site, in the next 3-4 years. In 2013, the annual report mentioned “*The design of new Solid waste site is complete. The Project is on hold due to funding. Therefore design was not submitted to NWB.*” There was a similar comment regarding the design to decommission the existing solid waste facility. CIRNAC did not find an explanation as to why the previously completed design is no longer applicable and why it is necessary to repeat several steps of the process.

Recommendation

CIRNAC recommends the proponent take short term and longer term actions to improve conditions at the landfill including:

- a. Updating the Hazardous Waste Management Procedure prior to any renewed licence being issued. Of particular importance is the implementation plan required in Part F, Item 3d of the current licence;
- b. Correct deficiencies in the Solidwaste Operation and Maintenance Plan listed above. This could include integrating the Hazardous Waste Management Procedure or referring to the Procedure if it is kept as a separate document;
- c. Providing an explanation why the 2013 new landfill design and decommissioning design will not be used. If possible and appropriate, these designs should be shared for review.

3. Water quality monitoring

Comment

Monitoring is an important part of operations, to evaluate the performance of waste management measures. Water quality sample results are not always submitted with the last annual reports available; specifically they are missing from the 2014 and 2019 reports. Both those reports indicate the results would be submitted separately; however results were not available on the Nunavut Water Board’s public registry.

For those years where results are available, sampling identification is not consistent with the licence monitoring stations, so it is not always possible to determine which stations the samples correspond to. Despite the Hamlet’s efforts to collect samples, get them analysed and report results, it is difficult to interpret them because we do not know sample locations.

Specifically, CIRNAC cannot confirm if 2018 samples labelled “Wastewater Sample 1 & 2” are from treated lagoon discharge or wastewater from the sewage truck. It is unclear if the 2015 Sewer Discharge samples “Top, Middle & Bottom” refer to a profile in the lagoon, samples taken at different times during decant or at different locations in the wetland.

CIRNAC noted that two samples identified as “Sewer Discharge” from 2015 exceeded the 120 mg/L biochemical oxygen demand (BOD₅) discharge criteria set out in the water licence. One of these samples also had 8.2 mg/L oil & grease, which might produce a visible sheen, another licence criteria. Two 2018 samples also had elevated BOD₅, but it is not clear where they were taken from.

The Inspectors have reported seeing signage installed at the monitoring stations, which is encouraging. The next step would be for samplers to identify the samples they take with the proper monitoring station names so the results can be evaluated.

Recommendation

CIRNAC recommends the proponent:

- a. properly identify their samples so the results can be evaluated;
- b. provide sample results with each annual report, preferably as tabular summaries; and
- c. at minimum, request analyses of the parameters for which there are criteria in the water licence so the effectiveness of treatment can be evaluated.

4. Water quantity monitoring

Comment

As specified in the water licence, monitoring station GRI-1 is for volume of “*Raw Water Supply Intake at the Water Supply Facility prior to treatment*”. The annual reports tabulate monthly water use “*as reported in our On Tap Water Delivery System*”. In Grise Fiord, these values are strikingly different, because all water is pumped from the source during a period of approximately 45 to 50 days when the source stream is running, as specified in the Water Supply in Grise Fiord document. The annual report should be reporting water abstraction over the 2-3 month period when it actually occurs during the summer.

Recommendation

CIRNAC recommends the proponent install a flow meter at the water supply intake and report water volumes taken from the stream for each month.

5. Updated water supply Operations and Maintenance Plan

Comment

Part F, Item 5 of the current licence requires the submission of an updated O&M Plan for the Water Supply Facility (Water Storage and Pumping System) within 3 months of licence issuance. CIRNAC did not locate an updated version of Manual.

The requirement underlines the need for a spill contingency plan that includes appropriate procedures for the chemicals kept on site. According to the manual, these would include calcium hypochlorite which is highly corrosive when wet.

Recommendation

CIRNAC recommends the proponent provide an updated O&M Manual for the Water Storage and Pumping System that includes a spill contingency plan, prior to any renewed licence being issued.

6. Applicant signature

Comment

The water licence renewal application does not contain the applicant's signature in box 28.

Recommendation

CIRNAC recommends the proponent provide a signed application.

C. REFERENCES

2013-2019 Annual Report for the Hamlet of Grise Fiord, Government of Nunavut – Community and Government Services, March 2014-2020.

2014, 2016-2018 Water Licence Inspection Forms, Crown-Indigenous Relations and Northern Affairs Canada, 2014, 2016-2018

Application for the Water Licence Renewal Municipality of Grise Fiord #3BM-GRI1520 Type-B Renewal, Government of Nunavut – Community and Government Services, August 5, 2020.

Desktop Review on the Sustainability of Nunavut's Drinking Water Sources, Centre for Water Resources Studies, 2017.

Executive Summary of the Hamlet of Grise Fiord, Water Licence #3BM-GRI1520, Government of Nunavut – Community and Government Services, August 2020.

Hazardous Waste Segregation, Storage and Transportation Procedure for the Hamlet of Grise Fiord, Government of Nunavut – Community and Government Services, July 2014.

Hydrology Assessment, Grise Fiord, Nunavut, Arkits Piusitippaa Inc., November 17, 2014.

Operation and Maintenance Manual for the Existing Sewage Lagoon, Hamlet of Grise Fiord, Baffin Region, Community and Government Services – Government of Nunavut, October 2014.

Operation and Maintenance Manual for Water Storage and Pumping System at Grise Fiord, N.W.T., GCG Dillon Consulting Limited, March 1988.

RE: Grise Fiord Secondary Water Source, Crown-Indigenous Relations and Northern Affairs Canada, July 31, 2020.

RE: NWB Renewal Licence No. 3BM-GRI1520, Nunavut Water Board, December 9, 2015

Solidwaste Operation and Maintenance Plan for Hamlet of Grise Fiord, Community and Government Services – Government of Nunavut, October 2014.

Water Supply in Grise Fiord, Government of Nunavut – Community and Government Services, July 29, 2020.