Environmental Protection Operations Directorate
Prairie & Northern Region
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Yellowknife, NT X1A 2P7

ECCC File: 6200 000 018/005
NWB File: 3AM-ARV1016

January 21, 2022

via email at: licensing@nwb-oen.ca

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Richard Dwyer:

RE: 3AM-ARV1016 – Hamlet of Arviat – Municipal Water Licence Renewal-Amendment Application

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) regarding the above-mentioned water licence application.

ECCC is providing technical, science-based information and knowledge based on our mandate pursuant to the *Canadian Environmental Protection Act* and the pollution prevention provisions of the *Fisheries Act*. These comments are intended to inform the assessment of this project's potential effects in the receiving environment and on valued ecosystem components. Any comments received from ECCC in this context does not relieve the proponent of its obligations to respect all applicable federal legislation.

The following comments are provided:

1. ARV-4 Monitoring Location

Reference(s)

- Business Case for Arviat Wastewater

Comment

The Business Case for the new Arviat wastewater treatment discusses the location of water quality monitoring downstream of the lagoon within the wetland area (ARV-4, which is the point of discharge from the system) and recommends that the location of ARV-4 be relocated to the end of the wetland, as wastewater treatment occurs within the wetland. It is

unclear whether GN-CGS is accepting this recommendation and proposing this change in the Water Licence Application.

ECCC Recommendation(s)

ECCC recommends GN-CGS clarify whether relocation of monitoring location ARV-4 is proposed.

2. Work Plan and Timelines for Proposed Updates

Reference(s)

- Cover Letter
- Business Case for Arviat Wastewater
- Email: feasibility study – solid waste facility
- Solid Waste Management Facility – Operations and Maintenance Plan

Comment

The Application indicates that there are upgrades planned for both the wastewater treatment facility and the solid waste facility. As indicated by the cover letter and the business case, GN-CGS is proposing to upgrade and expand the existing wastewater treatment facility, including construction of a new lagoon and demolition and replacement of the existing lagoon. The Business Case also recommends that several technical studies be completed along with the construction of the upgraded lagoon system, including a wetland study, a geotechnical study, and a detailed survey and assessment of the existing lagoon. For the solid waste facility, an email provided with the application package indicates that the Hamlet will not be proceeding with a new solid waste facility, but instead will be undertaking a new assessment in 2022/23 to determine what improvements can be made at the existing site. However, the updated Solid Waste Facility O&M Plan indicates that an extension to the existing solid waste facility is planned for 2024.

As noted, GN-CGS has identified there are several areas of planned work related to the wastewater and solid waste facilities over the upcoming years including completion of studies in advance of any construction. While several dates and timelines are discussed, the specific work plan and timelines for the upcoming projects are not entirely clear.

ECCC Recommendation(s)

ECCC recommends GN-CGS provide updated timelines and a work plan for studies and work related to the construction of the new wastewater facility and expansion of the solid waste facility.

3. Removal of Conditions Related to Abandonment and Restoration

Reference(s)

- Plan for Compliance – 2021

Comment

In the Plan for Compliance, Part G – Conditions Applying to Abandonment, Restoration, and Closure, GN-CGS has proposed removal of Conditions G1 and G2. Condition G1 is related to the submission of an Interim Abandonment and Restoration Plan for the Solid Waste Disposal Facility, Bulky Metals Area, and Hazardous Waste Storage Area. Condition G2 relates to the submission of a Final Abandonment and Restoration Plan for the two abandoned sewage lagoons. In both cases, the plan for compliance indicates that these sites are still in use and that the licensee requests that these be removed from the licence.

It is acknowledged that the Solid Waste Disposal Facility, Bulky Metals Area, and Hazardous Waste Storage Area are still in use; however, the intention of an interim abandonment and restoration plan is to provide preliminary planning for closure, as well as to identify any potential areas for progressive reclamation. The fact that the facility is still in use is not sufficient rationale for the removal of these conditions, and the interim plan may require updates since the 2010 submission.

For Condition G2, it is ECCC's understanding that the old sewage lagoon (two sewage lagoon cells located between the existing solid waste management facility and the current sewage lagoon) is not in use, and that only the current sewage lagoon is in use. In response to completeness comments GN-CGS verified this and stated that the old sewage lagoons are not in use and have not been cleaned or reclaimed. Given that these sewage lagoons are unused, work and planning towards final abandonment and restoration should be undertaken. In addition, it is unclear whether any information on abandonment and restoration of these lagoons has been submitted to date.

ECCC Recommendation(s)

ECCC recommends that GN-CGS:

- Provide an updated Interim Closure and Reclamation Plan for the Solid Waste Disposal Facility, Bulky Metals Area, and Hazardous Waste Storage Area and the Final Closure and Reclamation Plan for the two abandoned sewage lagoons.
- Describe the current state of abandonment and restoration activities completed on the unused sewage lagoon cells, and any planned future work.
- If additional work needs to be completed in order to provide updated plans, these water licence conditions should be updated and retained in the licence to ensure that information related to abandonment and restoration is provided.

4. Sludge Management

Reference(s)

- Sewage Treatment Facility Operations and Maintenance Plan – Section 6.0

Comment

The Sewage Treatment Facility O&M Plan notes that sludge has not been removed from the lagoon since it was commissioned in 2005 and that the current height of the sludge is 0.4 m from the bottom of the lagoon floor (20% of the total volume of the lagoon). The Plan indicates that sludge removal is recommended and was planned to take place in 2021 in order to improve capacity of the lagoon and eliminate the need for emergency decanting in the spring. It is unclear whether this desludging took place in 2021 or if it has yet to be completed. In addition, there are no details provided on the management, assessment, and disposal techniques for the desludging process.

ECCC Recommendation(s)

ECCC recommends GN-CGS:

- Provide an update on whether desludging occurred in 2021 and if not, when desludging is planned for.
- Provide information on sludge management, assessment, and disposal techniques and location.

5. Sewage Lagoon Monitoring Locations

Reference(s)

- Sewage Treatment Facility Operations and Maintenance Plan – Section 9.0

Comment

Table 2 of the Sewage Treatment Facility O&M Plan provides a summary of the monitoring stations, including those associated with the sewage lagoons and treatment wetland. This monitoring includes the following:

- ARV-3 – Raw sewage at truck offload point
- ARV-4 – Effluent from the discharge point of the sewage disposal facility (end of wetland)

ECCC notes that there is no sampling at the point of discharge from the lagoon into the wetland, or within the lagoon. There has been previous uncertainty on the efficacy of the lagoon treatment and the wetland treatment. Sampling at the point of discharge would provide comparison of the quality of effluent in the lagoon compared to the final effluent quality at ARV-4. This comparison would aid in evaluation and understanding of the treatment capacity of the wetland.

ECCC Recommendation(s)

ECCC recommends that consideration be given to include an additional monitoring station at the point of discharge from the lagoon into the wetland to evaluate sewage effluent quality prior to effluent entering the wetland.

6. Replicate or Duplicate Samples

Reference(s)

- Environmental Monitoring Program (EMP) and Quality Assurance/Quality Control (QA/QC) Plan – Section 4.2.2

Comment

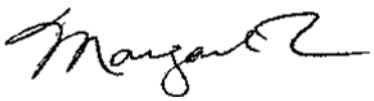
Section 4.2.2 of the EMP and QA/QC Plan provides a brief description of replicate or duplicate samples. However, no information is provided on how replicate or duplicate sampling will be implemented. The Plans should specify the frequency of replicate/duplicate sampling that will be completed as part of the sampling program.

ECCC Recommendation(s)

ECCC recommends that GN-CGS provide information of the frequency of replicate/duplicate samples within the sampling program.

If you need more information, please contact Victoria Shore at Victoria.Shore@ec.gc.ca.

Sincerely,



Margaret Fairbairn, Acting Regional Director
Environmental Protection Operations Directorate, Prairie Northern Region

cc: Jody Small, Acting Head, Environmental Assessment North (NT and NU)

February 3, 2022

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1L0

Attention: Richard Dwyer, Manager of Licensing

RE: 3AM-ARV---- Municipality of Arviat – Renewal and Amendment Application

Dear Richard,

The Government of Nunavut Department of Community and Government Services (CGS) on behalf of the Municipality of Arviat has prepared a response to the comments submitted by Environment and Climate Change Canada (ECCC), Crown Indigenous Relations and Affairs Canada (CIRNAC), and Fisheries and Oceans Canada (DFO) on the water license renewal and amendment application.

Regards,

Elan Chalmers
Municipal Planning Officer
Government of Nunavut
Community and Government Services
Email: echalmers@gov.nu.ca

Agency	Comment	Recommendation	Licensee Response
ECCC	01	The Business Case for the new Arviat wastewater treatment discusses the location of water quality monitoring downstream of the lagoon within the wetland area (ARV-4, which is the point of discharge from the system) and recommends that the location of ARV-4 be relocated to the end of the wetland, as wastewater treatment occurs within the wetland. It is unclear whether GN-CGS is accepting this recommendation and proposing this change in the Water Licence Application.	CGS accepts this recommendation and is petitioning that ARV-4 be established at the recommended location downstream in the wetland in an area accessible by municipal staff.
ECCC	02	ECCC recommends GN-CGS provide updated timelines and a work plan for studies and work related to the construction of the new wastewater facility and expansion of the solid waste facility.	CGS will provide an updated timeline for the wastewater and solid waste projects. CGS expects to have confirmation of funding for both projects by April 2022, which will allow a more definite schedule to be prepared and submitted to NWB for distribution. Until then, anticipated schedules can be provided.
ECCC	03	ECCC recommends that GN-CGS: □ Provide an updated Interim Closure and Reclamation Plan for the Solid Waste Disposal Facility, Bulky Metals Area, and Hazardous Waste Storage Area and the Final Closure and Reclamation Plan for the two abandoned sewage lagoons. □ Describe the current state of abandonment and restoration activities completed on the unused sewage lagoon cells, and any planned future work. □ If additional work needs to be completed in order to provide updated plans, these water licence conditions should be updated and retained in the licence to ensure that information related to abandonment and restoration is provided.	There is no plan to close the solid waste disposal area or the bulky metals area. The business case recommended that both areas remain in use indefinitely, and expansion take place. An investigation of the abandoned lagoon cells to assess their potential to be remediated and re-used to expand the current solid waste will be included in the next phase of the solid waste project, pending the funding approval by the federal government. Plans for the recommended remediation and re-use of the sewage lagoons will be provided once these studies are complete, pending funding approval.

ECCC	04	ECCC recommends GN-CGS: • Provide an update on whether desludging occurred in 2021 and if not, when desludging is planned for. • Provide information on sludge management, assessment, and disposal techniques and location.	After discussing the planned desludging in 2021 with the CIRNAC inspector, it was determined that since the lagoon cell is expected to be decommissioned, desludged, remediated, and upgraded in 2024, desludging in 2021 would provide minimal benefit (ie. Potentially 1-2 years of benefit prior to construction of new site) compared to the labor required for the undertaking. A new OM plan will be prepared by the design consultant and contractor for the new 2-cell lagoon. The plan will contain a sludge management plan that includes assessment and disposal techniques, as well as a disposal location.
ECCC	05	ECCC recommends that consideration be given to include an additional monitoring station at the point of discharge from the lagoon into the wetland to evaluate sewage effluent quality prior to effluent entering the wetland.	The licensee agrees that a monitoring station at the point of discharge from the lagoon should be included in the new license to aid in evaluation and understanding of the facilities treatment capacity. However, this station should not be considered a compliance point and no effluent limits should be imposed at this point since it represents only partially treated effluent.
ECCC	06	ECCC recommends that GN-CGS provide information of the frequency of replicate/duplicate samples within the sampling program.	The QA/QC Plan will be updated to include information on the frequency of replicate/duplicate samples in the sampling program.
CIRNAC	R-01	(R-01) CIRNAC recommends that the Licensee provide the detailed steps that it plans to take to address the overcapacity issue at the solid waste management facility (SWMF) until such time as a new facility can be constructed.	Beginning in 2018, the Municipality purchased equipment and began shredding depolluted metal waste to increase capacity at the site. The metal was then used as cover material for the landfill which resulted in compaction that drastically increased the capacity as seen in the photo below: 

			The Municipality also partnered with the local mine to have hazardous waste backhauled. Pending federal funding approval, CGS will undertake a study in 2022/23 to determine how to further improve capacity of the current solid waste site and evaluate the feasibility of expanding into the abandoned lagoon cells after proper remediation. The results will be submitted to NWB for distribution along with any subsequent designs and planned modifications.
CIRNAC	R-02	R-02) CIRNAC recommends that Licensee clarify: • The retention time of the effluent in the lagoon to achieve treatment goals before manual discharge by pumping. • The pumping rate from the lagoon discharge point to the wetland treatment area.	Lagoon-wetland systems do not function to achieve treatment goals prior to discharging into the wetland. The lagoon only represents first phase of the treatment process. The wetland treatment area is a significant component of the treatment facility. The 2-cell lagoon system will be sized to retain wastewater for 12 months for a 20-year design life following CSA W203:19 *Planning, design, operation, and maintenance of wastewater treatment in northern communities using lagoon and wetland systems.* Effluent will be decanted into the wetland treatment area in late summer once the wetland has had the opportunity to develop and runoff has passed through. Currently the effluent is benefiting from dilution rather than treatment, potentially resulting in lower effluent concentrations, but in reality, not better-quality effluent. The pumping rate will be determined during design to optimize both drawn down time and effectiveness off the wetland treatment~~,~~ but it will be below the recommended maximum of 2500 m^3/day to preserve the health of the marine receiving environment.
CIRNAC	R-03	CIRNAC recommends that the licensee clarify the change in parameters being requested in the two documents and update the documents accordingly.	The licensee is requesting that the effluent parameter limits at the end of the wastewater treatment facility be changed to cBOD/TSS of 100/120 mg/L. This error in the OM Plan will be fixed in the newer version.
CIRNAC	R-04	CIRNAC recommends that Licensee provide a detailed plan on how it intends to prevent seepage of the effluent into ground water in the event that localized thawing of the permafrost damages the impermeable liner.	In the event that the liner is damaged resulting in a leak, the effluent will passively exfiltrate into the wetland treatment area, which is downgrade from the lagoon, in the same way that it does with the current permeable lagoon. The new lagoon will use the same wetland as the current lagoon therefore no additional land will be contaminated. In addition, the effluent samples taken, and lagoon water levels will be monitored in order to detect evidence of a leak. Repairs to the liner will be completed if there is a leak.
CIRNAC	R-05	(R-05) CIRNAC recommends that the licensee provide rationales as to why: • the stations are being listed as “inactive”, and; • the Licensee is requesting that ARV-10 and ARV-11 monitoring stations be deleted from the licence.	A “hydrocarbon impacted storage facility” was never constructed and does not exist therefore ARV-10 and ARV-11 do not exist. Having inactive compliance points listed in the monitoring station program table is unnecessarily cumbersome for operational staff and provide no benefit. Historical information on previous compliance points is stored on the Nunavut Water Board FTP site and therefore should not be included in active licenses. The licensee agrees with removing these stations from the licence.

CIRNAC	R-06	(R-06) CIRNAC recommends that the Licensee update section 6 of its sewage treatment facility operation and maintenance plan to include acceptable methods of sludge disposal as required by the water licence.	A new OM plan will be prepared by the design consultant and contractor for the new 2-cell lagoon. The plan will contain a sludge management plan that includes assessment and disposal techniques, as well as a disposal location. The upgraded lagoon will be sized to accommodate 20 years of sludge accumulation. However, effluent samples as well as visual inspection will indicate if sludge accumulates more than anticipated, and appropriate methods to remove and dispose of the sludge will be included in the new, upgraded lagoon Operation and Maintenance plan.