



NIRB Application for Screening #125727

3BM-REP2126 Municipal Water Licence Amendment and Renewal

Application Type: New

Project Type: Municipal and Industrial Development

Application Date: 7/1/2022 1:19:14 PM

Period of operation: from 0001-01-01 to 0001-01-01

Proposed Authorization: from 0001-01-01 to 0001-01-01

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DETAILS

Non-technical project proposal description

English: The Government of Nunavut Department of Community and Government Services (CGS), on behalf of the Hamlet of Naujaat, is applying for the construction of a single cell lagoon located adjacent the current wastewater disposal site, and amendment of the discharge effluent limits in the existing water licence to effectively service the growing population in Naujaat until the design horizon of 2043. The treatment facility will be designed with a new upstream primary lagoon cell that is impermeable. The existing downstream natural depression that is acting as the current lagoon will become a secondary treatment cell, and the existing downstream wetland-treatment-area (WTA) will remain in use. Seasonal effluent pump out to the secondary cell and WTA is to occur late in the summer season to allow spring freshet to pass and to allow the wetland to recharge to promote its ability to support effluent biodegradation. The requested amendment to the effluent limits within the WTA is based on the most comprehensive research completed to date on lagoon-wetland systems in Nunavut, and considers the significant change to the hydrologic regime that will be influenced by the seasonal pump out of the future impermeable lagoon that will replace the passive exfiltration and dilution that occurs now. CGS retained Dillon Consulting Limited to develop the Pre-Design Report for the upgrade of the current sewage facility in the Hamlet of Naujaat. This study projected the flow and loadings based on the population growth, proposed the treated effluent goals and standards, reviewed and selected the most suitable location and treatment technologies, sized the lagoon system, and developed a conceptual schematic design. The treatment goals for the lagoon-wetland effluent criteria, at the end of the treatment process, were established as 100, 120, and 1.25 mg/L for carbonaceous biochemical oxygen demand, total suspended solids, and un-ionized ammonia as nitrogen, respectively, to protect the final receiving environment. These effluent criteria are based on 6 years of research completed by the Centre for Water Resources Studies at Dalhousie University directly in Naujaat and across Nunavut. Given an estimated population of 1,225 residents in 2021 by Statistics Canada, the design population to be serviced by the expanded lagoon was projected to be 2,175 people in 2043. This population will require an active storage volume 121,469 m³ for 12 months of storage. The lagoon discharge point will be by controlled manual pump out into the secondary lagoon that will then exfiltrate into the WTA which will remain at the same location. The decant system will be designed with a flowrate below 2500 m³/day to ensure effluent has sufficient residency time in the WTA.

French: Au nom du hameau de Naujaat, le ministère des Services communautaires et gouvernementaux (SCG) du gouvernement du Nunavut présente une demande de construction d'une lagune à bassin unique située à côté du site actuel d'évacuation des eaux usées et la modification des limites de l'effluent de rejet du permis d'utilisation de l'eau existant afin de desservir efficacement la population croissante de Naujaat jusqu'à la date de conception prévue, en 2043. La nouvelle installation de traitement comportera un nouveau bassin de lagune principal en amont, lequel sera imperméable. La dépression naturelle en aval faisant actuellement office de lagune deviendra un bassin de traitement secondaire et l'aire de traitement du milieu humide en aval demeurera en service. Le pompage saisonnier de l'effluent vers le bassin secondaire et l'aire de traitement du milieu humide doit avoir lieu à la fin de l'été pour permettre à la crue printanière de passer et à la zone humide de se remplir afin de favoriser sa capacité à soutenir la biodégradation de l'effluent. La modification demandée aux limites de l'effluent dans l'aire de traitement du milieu humide se fonde sur les recherches portant sur la structure des lagunes et du milieu humide au Nunavut les plus complètes à ce jour, et tient compte des changements importants au régime hydrologique, qui sera influencé par le pompage saisonnier de la future lagune imperméable devant remplacer l'exfiltration et la dilution passives actuelles. SCG a retenu les services de Dillon Consulting Limited pour rédiger le rapport de préconception sur la modernisation de l'installation d'égout actuelle dans le hameau de Naujaat. Cette étude a permis de projeter le débit et les charges en fonction de la croissance démographique, de proposer des objectifs et des normes en matière d'effluents traités, d'examiner et de choisir l'emplacement et les technologies de traitement les plus appropriés, de dimensionner le système de lagune et d'élaborer un schéma conceptuel. Les objectifs de traitement de l'effluent lagune-milieu humide, à la fin du processus de traitement, ont été établis à 100, 120 et 1,25 mg/L pour la demande biochimique en oxygène des matières carbonées, le total des solides en suspension et l'ammoniac non ionisé sous forme d'azote, respectivement, dans le but de protéger l'environnement récepteur final. Ces critères relatifs aux effluents sont fondés sur six années de recherches effectuées par le Centre for Water Resources Studies de l'Université Dalhousie, directement à Naujaat et dans tout le Nunavut. En tenant compte de la population estimée à 1 225 résidents en 2021 par Statistique Canada, des projections ont permis d'établir la population à desservir par la lagune agrandie à 2 175 personnes en 2043. Cette population nécessitera un volume de stockage actif de 121 469 m³ pour 12 mois de stockage. Le point de décharge de la lagune se fera par pompage manuel contrôlé dans la seconde lagune, qui s'exfiltrera ensuite dans l'aire de traitement du milieu humide, lequel demeurera au même emplacement. Le débit du système de décantation sera établi à une valeur inférieure à 2 500 m³/jour pour garantir à l'effluent un temps de repos suffisant dans l'aire de traitement du milieu humide.

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Post-Closure Phase: from to

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
New Single Cell Sewage Lagoon and Access Road	Waste disposal	Municipal	Naujaat currently utilizes a sewage disposal facility located 400 m from the northeast edge of the airport runway. It is located in a valley, south of the old solid waste disposal site. Sewage trucks offload from a discharge area located on the west side of the valley. Sewage collects in the valley at a natural depression which acts as a primary treatment cell, and flows approximately 1,400 m through a series of wetlands and surface water bodies before entering Hudson Bay.	None	Falls within the Naujaat Municipal Boundary

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Naujaat	Kevin Tegumiar	Hamlet of Naujaat	2022-06-16
Naujaat	Alan Robinson	Naujaat Municipal Council	2022-06-16

Authorizations

Indicate the areas in which the project is located:

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Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Water Board	The amendment application to the Naujaat water license will be submitted to NWB after the NIRB screening. The amendment will be for the construction of a new single cell lagoon located adjacent to the current wastewater disposal site to meet the capacity of the growing municipality and to adjust the effluent treatment limits to match what was identified in the Nunavut specific research	Not Yet Applied		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Land	Vacuum trucks collect sewage from building holding tanks and transport it for disposal at the active lagoon.	

Project accomodation types

Community

Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Sewage Truck	2	15,000L	Sewage Trucks will discharge waste into the lagoon one at a time
Excavator	1	10x15	Berm Construction
Dump Truck	1	10x20	Transport granular material from a quarry 8-10km away from the site for lagoon fill
Pump	1	N/A	Annual decant of sewage lagoon effluent into the adjacent wetland treatment area

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Diesel	fuel	0	0	0	Liters	The facility itself does not use fuel. Once annually a small portable pump will be used on site to decant the effluent contained in the lagoon. The pump is then removed from the site.

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
299	No change to current water supply system under the existing license. Water is pumped directly from water source into water treatment plant through dual intakes	No change to current water supply under the existing license.

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Waste disposal	Sewage (human waste)	121,469 m3 in 2043	Sewage truck disposes sewage into the lagoon where it is held until the annual effluent pump out into the wetland treatment area.	Treatment is provided within the lagoon and from the wetland treatment area.

Environmental Impacts:

The new single cell lagoon will be impermeable to contain the sewage until the annual decant. The current lagoon allows uncontrolled discharge into the wetland. The new lagoon will be designed to serve the community until 2043.

Construction of the new single cell lagoon will still allow for use of the existing natural depression that is acting as the current lagoon which will be used as a secondary treatment cell. The existing downstream wetland treatment area will remain in use.

Additional Information

SECTION A1: Project Info

SECTION A2: Allweather Road

SECTION A3: Winter Road

SECTION B1: Project Info

SECTION B2: Exploration Activity

SECTION B3: Geosciences

SECTION B4: Drilling

SECTION B5: Stripping

SECTION B6: Underground Activity

SECTION B7: Waste Rock

SECTION B8: Stockpiles

SECTION B9: Mine Development

SECTION B10: Geology

SECTION B11: Mine

SECTION B12: Mill

SECTION C1: Pits

SECTION D1: Facility

SECTION D2: Facility Construction

SECTION D3: Facility Operation

SECTION D4: Vessel Use

SECTION E1: Offshore Survey

SECTION E2: Nearshore Survey

SECTION E3: Vessel Use

SECTION F1: Site Cleanup

SECTION G1: Well Authorization

SECTION G2: Onland Exploration

SECTION G3: Offshore Exploration

SECTION G4: Rig

SECTION H1: Vessel Use

SECTION H2: Disposal At Sea

SECTION I1: Municipal Development

The asset will be owned and operated by the municipality for the purpose of sewage disposal and treatment.

Description of Existing Environment: Physical Environment

The land is already zoned for waste disposal.

Description of Existing Environment: Biological Environment

The land is already zoned for waste disposal. The impact to the receiving environment will be improved as the current lagoon allows uncontrolled discharge into the wetland treatment area and the new lagoon will not. Treatment will be enhanced by the new infrastructure.

Description of Existing Environment: Socio-economic Environment

The land is already zoned for waste disposal. Sewage disposal is critical for municipal operations.

Miscellaneous Project Information

This application is to amend the 3BM-REP2126 water license to include the construction of a new single cell sewage lagoon in the new license. The current lagoon is under capacity. The lagoon will be designed to hold 12 months of wastewater for a design life of 20 years, giving consideration to population growth. The wetland treatment area and discharge into the wetland treatment area will remain the same. Additionally, the licensee is requesting to change the effluent treatment parameter limits to cBOD = 100mg/L, TSS = 120 mg/L, and unionized ammonia as nitrogen = 1.25 mg/L based on the best available wastewater treatment research conducted in Nunavut. Construction activities will include blasting and excavation. All excavated materials will be hauled away, while fill for the lagoon berm will be sourced from a quarry 8-10km away from the construction site, with material that only requires screening.

Identification of Impacts and Proposed Mitigation Measures

This project is intended to improve the current wastewater treatment facility in Naujaat. The lagoon will be designed to meet the long term needs of Naujaat. The new lagoon will be impermeable to contain the sewage until annual decant; the current lagoon allows uncontrolled discharge through the wetland treatment area.

Cumulative Effects

This project will enhance wastewater treatment, reducing impacts on the receiving environment.

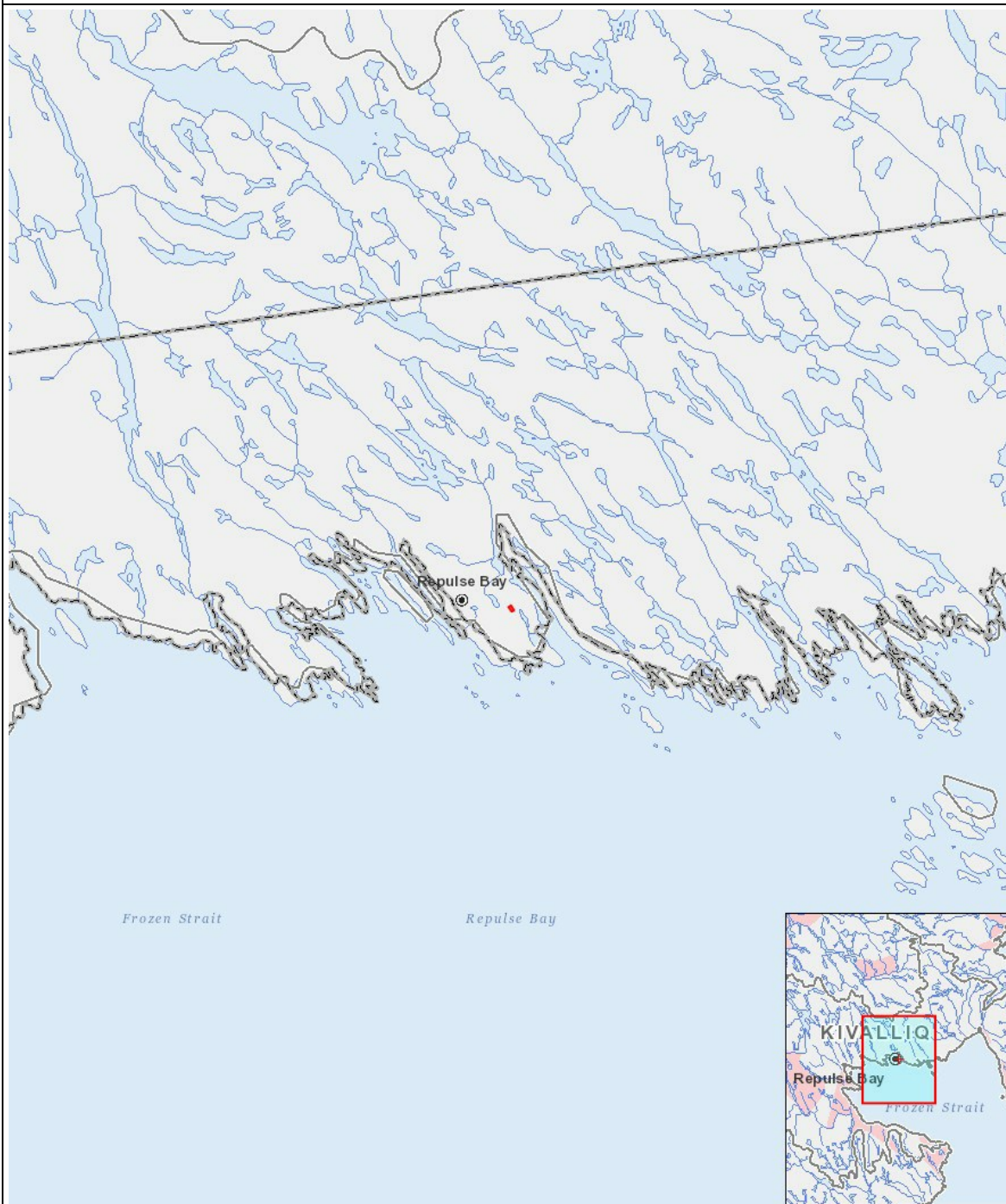
Impacts

Identification of Environmental Impacts

		PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
Construction																										
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Operation																										
Waste disposal		-	-	-	-	P	-	-	-	-	-	-	-	-		-	-	M	P	-		-	-	-	P	P
Decommissioning																										
-		-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

- | | | |
|---|---------|---|
| 1 | polygon | New Single Cell Sewage Lagoon and Access Road |
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