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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No: 8BC-EUR2131

June 13, 2022

Jean-Philippe Cloutier-Dussault
Property Manager, Assets Real Property and Security Directorate
Environment and Climate Change Canada
160 Chemin Tour-de-l'Isle
Montreal, QC H3C 4G8

Email: Jean-Philippe.Cloutier-Dussault@ec.gc.ca

RE: NWB Amendment Water Licence No: 8BC-EUR2131

Dear Jean-Philippe Cloutier-Dussault:

Please find attached Amendment Water Licence No: 8BC-EUR2131 (Licence) issued to Environment and Climate Change Canada (ECCC or Applicant) by the Nunavut Water Board (NWB or Board) pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada* (*Nunavut Agreement*). The terms and conditions of the attached Licence related to the use of Water and the deposit of Waste are an integral part of this approval.

The NWB notes that the Nunavut Planning Commission's (NPC) conformity determination, issued on February 22, 2021, states that the project proposal conforms to the North Baffin Regional Land Use Plan subject to the attached requirements and the conformity determinations, dated December 17, 2010, April 19, 2012, April 16, 2016, March 7, 2018, January 22, 2021, and February 9, 2021, remain applicable, and, as determined by the Nunavut Impact Review Board (NIRB)[1], a review of the Project is not required in accordance with s. 92(1)(a) of the *Nunavut Planning and Project Assessment Act* (*NuPPAA*).

[1] Nunavut Impact Review Board (NIRB) Screening Determination, May 13, 2021.

Sincerely,

Lootie Toomasie
Nunavut Water Board,
Chair

LT/ak/rqd

Enclosure: Amendment Water Licence No: 8BC-EUR2131
Comments – CIRNA

Cc: Distribution List – Qikiqtani

AMENDMENT WATER LICENCE No: 8BC-EUR2131

Licensee:	**Environment and Climate Change Canada**
Licence No:	**8BC-EUR2131 Type "B"**
Licence Issued:	**July 22, 2021**
Licence Expiry:	**July 21, 2031**
Amendment Water Licence No:	**8BC-EUR2131 Type "B"**
Amendment Water Licence Effective Date:	**June 13, 2022**

Pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada (Nunavut Agreement)* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act (NWNSRTA)*, with respect to an application for amendment, dated February 18, 2022, by Environment and Climate Change Canada (ECCC or Applicant), the Board hereby grants the following Amendment Water Licence.

The Licence issued July 22, 2021 with an expiry date of July 21, 2031, shall be amended to include the terms and conditions reflecting water and sewage treatment facilities construction and operation with respect to the use of Water and deposit of Waste during activities related to camp activities (Other Undertaking[1]) at the Eureka High Arctic Weather Station (HAWS).

PROCEDURAL HISTORY

The water licence amendment application (Application) being considered by the Nunavut Water Board (NWB or Board) was filed by Environment and Climate Change Canada (the Applicant, Licensee or ECCC) on February 18, 2022 to seek amendments to its Type "B" Water Licence No: 8BC-EUR2131 resulting in the issuance of Water Licence No: 8BC-EUR2131 Amendment No. 1 (Licence) for the Eureka High Arctic Weather Station (HAWS or Eureka) Project.

The Project is located 425 km north-northwest of Grise Fiord within the Qikiqtani Region of Nunavut. Facilities and activities at Eureka include operation of a water reservoir, pump-house, water crossings, sewage lagoon, several landfills and a landfarm, power-house, fuel storage facility, electrical-plumbing-carpentry facilities shops, accommodations and other buildings, maintenance garage, warehouses, quarry operation, runway surface repair, dust suppression, and incineration.

ECCC sought to construct and operate a new water storage reservoir, a wastewater treatment plant, and a greywater exfiltration trench. The Applicant also indicated that it plans to convert the existing sewage lagoon into a wastewater retention pond.

[1] Schedule I, Nunavut Waters Regulations, SOR/2013-69

Requirements of the NWNSRTA and the Nunavut Agreement

On February 22, 2021, the Nunavut Planning Commission (NPC) issued correspondence indicating that the project proposal conforms to the North Baffin Regional Land Use Plan, and the conformity determinations, dated December 17, 2010, April 19, 2012, April 16, 2016, March 7, 2018, January 22, 2021, and February 9, 2021, remain applicable. As determined by the Nunavut Impact Review Board (NIRB) on May 13, 2021, a review of the project is not required in accordance with s. 92(1)(a) of *NuPPAA.*

Public Review and Comments

On April 27, 2022, Crown-Indigenous Relations and Northern Affairs (CIRNA) provided[2] its comments with a number of recommendations. These are discussed in corresponding sections below. On May 12, 2022, the Applicant responded to the comments to the intervener's satisfaction as confirmed on May 19, 2022.

ISSUES CONSIDERED

Conditions Applying to Water Use

The Licensee provided engineering drawings for the planned new raw water storage reservoir. The work is scheduled to be completed in August 2024. The Board accepted the provided engineering drawings with the issuance of this Licence.

Conditions Applying to Waste Disposal

ECCC intends to install and operate a wastewater treatment plant to be commissioned in 2023. In its Application, ECCC stated: "The new wastewater treatment plant will be sealifted to site and consists of four (4), 6m long high-cube shipping containers with peak hour flow capacity of $28m^3$/day." Subsequently, the existing sewage lagoon will be converted to a wastewater retention pond.

In addition, the Applicant requested the Board's approval to construct a greywater exfiltration trench. The trench is to treat 5 m^3 daily of greywater from the construction camp. ECCC stated: "(t)he trench is a subsurface system consisting of a perforated pipe, surrounded by aggregate, which provides temporary storage and then passive treatment of received water by exfiltration… The grey water would flow to a holding tank and periodically be pumped into the trench…"

[2] David Zhong (CIRNA) to Richard Dwyer (NWB), Subject: Crown-Indigenous Relations and Northern Affairs Canada's review comments on amendment application by Environment and Climate Change Canada for its Water Licence 8BC-EUR2131 for Eureka High Arctic Weather Station on Ellesmere Island, Nunavut, dated April 27, 2022.

In its comment submission, CIRNA expressed concern over the waste disposal methods as proposed by the Applicant. The agency recommended that ECCC:

- Confirm whether the exfiltration trench is of sufficient capacity to properly treat greywater;
- Provide a consideration of the alternatives to trench greywater treatment;
- Explain sludge management procedures for the wastewater treatment plant;
- Confirm whether waste disposal facilities for the Project are located at a minimum of thirty-one metres from the ordinary high-water mark;
- Clarify if sludge or contaminated soil are produced on-site; and
- Outline the schedule for construction of the planned facilities.

The Applicant responded to CIRNA's comments by stating the following:

- The capacity of the exfiltration trench is 16.2 m^3, which is enough for three-day volume of greywater;
- The current sewage lagoon does not provide sufficient treatment of wastewater. The greywater exfiltration trench will provide a temporary measure to avoid lagoon overload until the wastewater treatment plant is operational;
- *"Sludge generated by the packaged wastewater treatment plant will go through a separate process for Aerobic Digestion. The sludge will be aerated for approximately 30 days to help stabilize the sludge, thereby reducing pathogenic micro-organisms and the organic concentration within the sludge. At this point, polymer will be added and the sludge will be wasted approximately weekly to dewatering bags. This dewatered sludge is estimated to be between 15 and 25 percent solids and will be disposed of in the landfill. The volume of sludge will vary depending on the population and amount of time used for drying, but it is anticipated that the dewatered sludge volume will be between 1 and 2 m^3 per year. Solids generated by the exfiltration trench will be collected in the settling side of the septic tank, upstream of the grey water field. These solids will be thickened through decanting and freeze thaw dewatering. The final solids will be removed from site for disposal in an approved facility or added to incineration toilets for disposal".*
- All waste disposal facilities except for the sewage lagoon are removed to a distance of at least thirty-one metres from the high-water mark. The sewage lagoon was constructed in 1974 and is located within the thirty-one metres distance;
- There are hydrocarbon-contaminated soils on-site that are undergoing treatment. Sludge will be generated, and
- The timeline for construction was provided by the Licensee.

Due to the Licensee's plans to construct and operate a wastewater treatment plant (WWTP), the NWB imposed effluent limits for the WWTP output in Part D, Item 19 as per the information supplied by ECCC.

The Board noted that the Licensee does not consider contaminated soil as waste due to it being treated on-site. The Board would like to point out that, according to the definition of Waste as provided in Water Licence No: 8BC-EUR2131, the contaminated soil in question is, indeed, a waste. In addition, ECCC stated in its response to CIRNA that "(a)s part of the wastewater treatment upgrades, the sewage lagoon will be converted to a retention pond for treated wastewater and will no longer be considered a component of the wastewater treatment process." The NWB notes that, even upon conversion of the sewage lagoon into a treated wastewater retention pond, the pond will remain a waste disposal facility.

The Licensee committed to updating the *Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities* dated June 2021 to include the changes to the site infrastructure.

Conditions Applying for Camps, Access Infrastructures and Operations

The Board included a standard requirement for the Licensee to provide issued for-construction drawings and design information ahead of construction.

Conditions Applying to Monitoring

The Board included new Monitoring Program Stations to reflect the construction and operation of new Waste Disposal Facilities.

In addition, the Board would like to remind ECCC of Part I, Item 9 of the original licence requiring the submission of a revised Quality Assurance / Quality Control (QA/QC) Plan. On November 18, 2021, ECCC committed to provide the QA/QC Plan prior to the 2022 sampling season.[3]

[3] Jean-Philippe Cloutier-Dussault (ECCC) to Richard Dwyer (NWB), Eureka High Arctic Weather Station QAQC Program for water licence 8BC-EUR2131, dated November 18, 2021.

AMENDMENT WATER LICENCE NO: 8BC-EUR2131

The Licence shall be amended to indicate the following:

Licence No: 8BC-EUR2131

Pursuant to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

ENVIRONMENT AND CLIMATE CHANGE CANADA

(Licensee)

160 CHEMIN TOUR-DE-L'ISLE, MONTREAL, QC H3C 4G8

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use water or dispose of Waste for a period subject to restrictions and conditions contained within this Licence Renewal-Amendment:

Licence Number/Type:	**8BC-EUR2131 / TYPE "B"**
Water Management Area:	**NANSEN AND EUREKA SOUNDS WATERSHED (59)**
Location:	**EUREKA HIGH ARCTIC WEATHER STATION (HAWS) QIKIQTANI REGION, NUNAVUT**
Classification:	**8. OTHER UNDERTAKING**
Purpose:	**DIRECT USE OF WATER AND DEPOSIT OF WASTE**
Quantity of Water use not to Exceed:	**TEN THOUSAND (10,000) CUBIC METRES PER ANNUM AT A MAXIMUM RATE OF TWO HUNDRED AND NINETY-NINE (299) CUBIC METRES PER DAY**
Date of Licence Issuance:	**JULY 22, 2021**
Expiry of Licence:	**JULY 21, 2031**

This Renewal Licence, issued and recorded at Gjoa Haven, Nunavut, includes and is subject to the annexed conditions.

Lootie Toomasie
Nunavut Water Board, Chair

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

2. **Definitions**

Insert

"**Greywater Exfiltration Trench**" means the system composed of a perforated pipe and aggregate with the purpose of Greywater treatment as described in the application dated February 18, 2022.

Amend "Waste Disposal Facilities" to Read:

"**Waste Disposal Facilities**" means the Sewage Treatment Facility (Wastewater Retention Pond upon completion of the Wastewater Treatment Plant), Greywater Exfiltration Trench, Wastewater Treatment Plant, Landfill, Temporary Contaminated Soil Storage, and Landfarm facilities;

Insert

"**Wastewater Retention Pond**" means the Sewage Treatment Facility converted into a treated wastewater reservoir upon commissioning of the Wastewater Treatment Plant as described in the application dated February 18, 2022.

Insert

"**Wastewater Treatment Plant**" means the engineered system that is designed for the containment and treatment of Sewage generated by the Eureka High Arctic Weather Station as described in the application dated February 18, 2022.

Amend "Water Supply Facility" to Read:

"**Water Supply Facility**" means the area and associated intake infrastructure at Station Creek, West Remus Creek, and Blacktop Creek, raw water storage reservoirs, storage tanks, and piping as described in the applications dated June 18, 2021 and February 18, 2022.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

Amend Item 9 to Read:

The Licensee shall direct Sewage to the Sewage Treatment Facility and Greywater to the Greywater Exfiltration Trench until such time as the Wastewater Treatment Plant is commissioned or as otherwise approved by the Board in writing.

Amend Item 14 to Read:

The Licensee shall provide at least ten (10) days written notification to an Inspector, prior to initiating any Effluent discharge from the Sewage Treatment Facility, Greywater

Exfiltration Trench, Wastewater Retention Pond, Temporary Contaminated Soil Storage, and Landfarm Facility.

Insert Item 19:

Effluent discharged from the from the Final Discharge Point at monitoring station EUR-3 upon completion of the Wastewater Treatment Plant shall not exceed the following Effluent quality limits:

Parameter	Maximum Concentration of any Grab Sample
Biochemical Oxygen Demand BOD_5	25 mg/L
Total Suspended Solids	25 mg/L
Fecal Coliforms	200 CFU/100 mL
pH	between 6.0 and 9.0
Oil and grease	No visible sheen
Total Phosphorus	10 mg/L
Unionized Ammonia	1.25 mg/L as N

PART E: CONDITIONS FOR CAMPS, ACCESS INFRASTRUCTURES AND OPERATIONS

Amend Item 2 to Read:

The Licensee shall, at least thirty (30) days prior to commissioning the Greywater Exfiltration Trench, submit to the Board for review the updated *Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities* dated June 2021 previously approved by the Board.

Insert Item 19:

The Licensee shall, at least sixty (60) days prior to commissioning the Wastewater Treatment Plant, submit to the Board for approval the updated Plan stated under Part E, Item 2.

Insert Item 20:

The Licensee shall, at least sixty (60) days prior to construction or in a timeframe otherwise approved by the Board in writing, submit to the Board for review final design and for-construction drawings, stamped and signed by a Professional Engineer, for all infrastructure and/or facilities designed to contain, withhold, divert or retain Water and/or Waste, as authorized under the Licence.

Insert Item 21:

The Licensee shall, submit to the Board for review, within ninety (90) days of completion

of infrastructure authorized under this Licence, to contain, withhold, divert or retain Water or Wastes; a construction summary report prepared by an Engineer that includes, among other relevant information, as-built drawings, documentation of field decisions that deviated from original plans, and any data used to support these decisions.

PART I: CONDITIONS APPLYING TO THE MONITORING PROGRAM

Amend Item 1 to Read:

The Licensee shall maintain Monitoring Stations at the following locations:

Monitoring Program Station ID	Description	Status
EUR-1	Raw water supply prior to treatment at Station Creek	Active (Volume)
EUR-2	Runoff from the Solid Waste Disposal Facilities	Active (Quality)
EUR-3	Effluent discharge from the Sewage Treatment Facility to the ocean. Effluent discharge from the Wastewater Treatment Plant or Wastewater Retention Pond upon completion of Wastewater Treatment Plant.	Active (Quality, Volume)
	Quantity in cubic metres of sludge removed from the Sewage Treatment Facility	
EUR-4	Effluent Discharge from the Landfarm	Active (Quality)
EUR-5	Runoff from the quarry development at the exit point of ditches designed to collect and hold runoff water prior to release.	Active (Quality)
EUR-6	Effluent Discharge from the Temporary Contaminated Soil Storage	Active (Quality)
EUR-7	Raw water supply at West Remus Creek	Active (Volume)
EUR-8	Raw water supply at Blacktop Creek	Active (Volume)

EUR-9	Effluent discharge from the Greywater Exfiltration Trench	Active (Quality, Volume)
	Quantity in cubic metres of sludge removed from the Greywater Exfiltration Trench	

Amend Item 4 to Read:

The Licensee shall measure and record in cubic metres the daily quantities of Effluent pumped from the Sewage Treatment Facility (Wastewater Retention Pond upon completion of Wastewater Treatment Plant), Greywater Exfiltration Trench, and Wastewater Treatment Plant during release to the environment.

Amend Item 5 to Read:

The Licensee shall analyze samples prior to the release of Effluent from the Sewage Treatment Facility (Waste Wastewater Treatment Plant or Wastewater Retention Pond upon completion of Wastewater Treatment Plant) at EUR-3, and Greywater Exfiltration Trench at EUR-9, for the purpose of demonstrating compliance with the parameters listed under Part D, Item 10.

Amend Item 6 to Read:

The Licensee shall sample monthly at Monitoring Program Stations EUR-2, EUR-3, EUR-4, EUR-6, and EUR-9 during periods of observed flow and annual discharges. Samples shall be analyzed for the following parameters:

BOD_5	Fecal Coliforms
Total Suspended Solids	pH
Conductivity	Nitrate-Nitrite
Oil and Grease (visual)	Ammonia Nitrogen
Total Phenols	Total Alkalinity
Total Hardness	Calcium
Magnesium	Potassium
Sodium	Sulphate
Chloride	Total Organic Carbon (TOC)
Total Cadmium	Total Zinc
Total Cobalt	Total Iron
Total Chromium	Total Manganese
Total Copper	Total Nickel
Total Aluminum	Total Lead
Total Mercury	Total Arsenic