



Water Resources Division
Resource Management Directorate
Nunavut Regional Office
918 Nunavut Drive
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Your file - Votre référence
8AC-ALT1929
Our file - Notre référence
GCDOCS# 125115794

May 16, 2024

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
E-mail: licensing@nwb-oen.ca

**Re: Crown-Indigenous Relations and Northern Affairs Canada's Review of the
Licence 2023 Annual Report for Alert, Type A Water Licence No. 8AC-ALT1929**

Dear Richard,

Thank you for the March 27, 2024 invitation to review the referenced licence 2023 Annual Report, submitted by the Department of National Defence, for Type A Water Licence No. 8AC-ALT1929.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the application pursuant to its mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*. Please find CIRNAC comments and recommendations in the attached Technical Memorandum.

The applicant shall provide confirmation from the Nunavut Water Board that all outstanding water license fees have been paid in full prior to approval of this application.

If there are any questions or concerns, please contact me at (867) 975-3877 or Joyce.Demers@rcaanc-cirnac.gc.ca or Andrew Keim at (867) 975-4550 or Andrew.Keim@rcaanc-cirnac.gc.ca.

Sincerely,

Joyce Demers, B.Sc.,
Industrial Coordinator

Canada 



Technical Review Memorandum

Date: May 16, 2024

To: Richard Dwyer – Manager of Licensing, Nunavut Water Board

From: Joyce Demers – Industrial Coordinator, CIRNAC

Subject: **Crown-Indigenous Relations and Northern Affairs Canada's Review of the Licence 2023 Annual Report for Alert, Type A Water Licence No. 8AC-ALT1929**

Region: ☐ Kitikmeot ☐ Kivalliq ☒ Qikiqtani

A. BACKGROUND

Canadian Forces Station Alert (Alert) is located on the north-eastern tip of Ellesmere Island, approximately 817 kilometers away from the geographic North Pole, overlooking Parr Inlet and Dumbell Bay along the Arctic Ocean within the Qikiqtani region of Nunavut at geographical coordinates 82° 30' 01" N and 62° 20' 37" W. Alert operates under a Type A water licence 8AC-ALT1929, which allows it to use and deposit waste to support its military and research undertakings. The water licensee is the Department of National Defence (DND, licensee).

The water licence allows for:

- the withdrawal of water up to 875 m³/day from Upper Dumbell Lake,
- a water treatment and supply facility,
- wastewater treatment facilities including a Terrace Wetland Treatment Area,
- solid waste management facilities including the Main Station Landfill (solid domestic waste), the Millionaires Dump (large objects), the HazMat Barrel Compound (empty fuel barrels), and two legacy dumps no longer in use, (the Battery Dump and Dump 3 for machine parts and metal objects),
- Fuel Storage Facilities, including an Airport/Lower Fuel Tank Farm, an Upper Fuel Tank Farm, and a Day Fuel Tank Farm, all connected by a pipeline; and
- the operation of two Landfarms to treat hydrocarbon contaminated soils: the Airfield Landfarm and the Day Fuel Tank Landfarm.

DND has submitted their 2023 Annual Report for review as per Part B item 1 of the water licence "The Licensee shall file, with the Board for review, no later than the 31st of March of the year following the calendar year being reported, an Annual Report formulated in accordance with the requirements under Schedule B of this Licence."



In order to prevent pipes from freezing and becoming damaged, the licensee reports a daily average intake of water to be 609 m³ and returns 516 m³ of raw untreated water back to Upper Dumbell Lake. The average daily intake of water was 92 m³ with a total annual amount of water of 221,517 m³. Hazardous wastes were backhauled for disposal by external contractors and non-hazardous domestic waste was placed in the Main Station Landfill. Repairs to the Sewage Terrace System were completed in 2022 and was inspected in 2023 by the licensee and deemed to be successful. DND will continue to monitor and repair the Sewage Terrace System until the new Sewage Treatment Plant is constructed. All sewage in 2023 was directed to the Sewage Terrace System.

There was one reported spill on March 29 2023 which resulted in approximately 1000L of ethylene glycol monoethyl ether below building 17 which is the transport garage.

The Annual Report included three reports from third parties: “CFS Alert Wastewater Treatment Options Analysis Report” prepared by Nunami Stantec Limited on January 19 2024, “CFS Alert Wastewater Treatment Option Analysis, Alert Nunavut” prepared by Stantec Consulting Ltd on October 12 2023, and “Investigation into background lead (Pb) within meltwater, the surrounding environment and other locations at Canadian Forces Station (CFS) Alert”, prepared by The RMC Green Team on March 2024.

DND’s plans for 2024 include the construction of a new land farm, as well the continuation of a background sampling program which is to be completed in 2026 (2022-2026).

CIRNAC provides the following comments and recommendations pertaining to the 2023 Annual Report. A summary of the subjects of recommendations can be found in Table 1. Documents reviewed as part of this submission can be found in Table 2 of Section B. Detailed technical review comments can be found in Section C.



Table 1: Summary of Recommendations

Recommendation Number	Subject
R1	Exceedances Action Plan
R2	Monthly and Annual Quantities of Discharges to Wastewater Treatment Facilities Not Reported
R3	Quality Data from Station ALT-12 Not Reported
R4	Monthly and Annual Quantity of Sludge removed from Wastewater Treatment Facilities and Wastes disposed of at the Solid Waste Disposal Facilities Not Reported
R5	Sewage Terrace and Outfall System Condition
R6	Spill Clean Up Follow Up
R7	Water Management and Containment Systems Lacking Infrastructure
R8	Follow up on the Water Management Plan
R9	Follow up on 2019 Inspection Report

B. DOCUMENTS REVIEWED AND REFERENCED

The following table (Table 2) provides a list of the documents reviewed under the submission and reference during the review.

Table 2: Documents Reviewed and Referenced

Document Title	Author, File No., Rev., Date
191101 8AC-ALT1929 Water Licence -ODDE	Lootie Toomasie, November 1 2019
230623 8AC-ALT1929 2022 Annual Report CIRNAC Review Comments-IMLE	Aminul Haque, June 23 2023
231018 8AC-ALT1929 -DND RESPONSE TO ANNUAL REPORT NWB_CIRNAC OCT 2023 Final-ILAE	Nathan Koutroulides, October 18 2023
230823 8AC-ALT1929 2022 Annual Report Review-OAKE	Assol Kubeisinova, August 23 2023
240327 8AC-ALT1929 2023 Annual Report-IMLE	Nathan Koutroulides, March 2024
240327 8AC-ALT1929 and 8BC-ERK2131 2023 Annual Reports E-mail Dist-OMLE	Richard Dwyer, March 27 2024
FIELD OPS- WATER LICENCE INSPECTION- DND ALERT - 3BC-ALT1015- JULY 10 2019 1265799 (002)	Jeremy Fraser, July 10 2019



C. RESULTS OF REVIEW

1. Exceedances Action Plan

Comment:

There are multiple exceedances listed with no action plan to correct them. Specially, exceedances with oil, grease, TSS, lead, copper, nickel, zinc, phenols, chromium and biological oxygen demand (BOD). There is mention of a background sampling program however a sampling program is not an action plan to correct the immediate problem of exceedances and therefore is in non-compliance with the licence. Below is a summary table with exceedances found in the submitted in the 2023 Annual Report.

Table 3. Summary of exceedances listed in the 2023 Annual Report

Station	Oil	Grease	TSS	Lead	Copper	Nickel	Zinc	Phenols	Chromium	BOD
ALT-1 Pumphouse					X					
ALT-2 Sewage Outfall	X	X	X	X	X		X	X	X	X
ALT-3 Sewage Terrace System	X	X	X	X	X	X	X			
ALT-4 Main Station Landfill			X	X	X	X	X			
ALT-5 Battery Dump					X					
ALT-6 Millionaire's Dump				X	X	X	X			
ALT-7 Dump 3			X							
ALT-8 Lower Airfield Tank Farm				X	X				X	
ALT-9 Upper Airfield Tank Farm					X					
ALT-11 Landfarm					X					

Results of exceedances founds in the Annual Report pages 26-34, 39, 114



Recommendation:

(R-01) CIRNAC recommends that the licensee provide an actionable plan for addressing the exceedances to reduce the number of overall exceedances and mitigates the issues by removing the source of these exceedances.

2. Monthly and Annual Quantities of Discharges to Wastewater Treatment Facilities Not Reported

Comment:

According to Schedule B Item b of the water license the licensee is required to provide “The monthly and annual quantities in cubic metres of any Discharges to the Wastewater Treatment Facilities at Monitoring Stations ALT-2, ALT-3, and ALT-13”. These discharge quantities were not reported in the 2023 Annual Report.

Recommendation:

(R-02) CIRNAC recommends that the licensee provide the monthly and annual quantities of discharges to the wastewater treatment facility.

3. Quality Data from Station ALT-12 Not Reported

Comment:

According to Schedule B Item c of the water license the licensee is required to provide the “Quality of the runoff from the Solid Waste Management Facilities and Fuel Storage Facilities at Monitoring Program Stations: ALT-4, ALT-5, ALT-6, ALT-7, ALT-8, ALT-9, ALT-10, ALT-11, and ALT-12”. Station ALT-12 results were missing from the 2023 Annual Report.

Recommendation:

(R-03) CIRNAC recommends that the licensee provide the missing quality data from station ALT-12, or provide a rational for the information not being included in the 2023 Annual Report.

4. Monthly and Annual Quantity of Sludge removed from Wastewater Treatment Facilities and Wastes disposed of at the Solid Waste Disposal Facilities Not Reported

Comment:

According to Schedule B Items d and e of the water license the licensee is required to provide “The monthly and annual quantities in cubic metres of sludge removed from the Wastewater Treatment Facilities” and the “The monthly and annual quantities of Wastes



disposed of at the Solid Waste Disposal Facilities” respectively. These values were not included in the 2023 Annual Report.

Recommendation:

(R-04) CIRNAC recommends that the licensee provide the monthly and annual quantities of sludge removed from the wastewater treatment facilities and the solid waste disposed at the disposal facilities.

5. Sewage Terrace and Outfall System Condition

Comment:

The Investigation into background lead (Pb) within meltwater, the surrounding environment and other locations at Canadian Forces Station (CFS) Alert report completed by RMC Green Team from March 2024 states that

“The Sewage Terrace and outfall system ALT 2 and ALT 3 are in fair/poor condition. They show signs of erosion and breaks in the terrace’s zig-zag berms, causing effluent to flow directly downhill rather than following the intended pattern (which was initially designed to increase retention time for the wastewater, thus increasing the potential for settling of contaminants) due to the low (or collapsed) berms which are built with silt and shaly, permeable soils in the area.”

The executive summary states that

“Repairs to the sewage terrace system completed in 2022 were inspected and were successful for 2023. DND will continue to monitor and repair as required until the new sewage treatment plant is constructed.”.

However, the noted about study above is suggesting otherwise. It is unclear how DND found that the repairs were successful. The concern is that this system is not functioning as intended which may lead to possible contamination into nearby water bodies.

Recommendation:

(R-05) CIRNAC recommends that the licensee provide a potential action plan to repair defects in the Sewage Terrace and Outfall System. The plan that addresses these issues should be submitted to the Nunavut Water Board and CIRNAC Inspectors for approval. The plan should be submitted within 60 days so that actions can be taken this season to prevent possible contamination entering water bodies.



6. Spill Clean Up Follow Up

Comment:

The Spill Report dated May 9, 2023 was included in the 2023 Annual Report which states that there was a glycol spill on March 29 2023 located in Building 17 (the Transport Garage). The spill was due to a break/spilt in the line of the de-icing truck. 1500L of glycol was spilled and only 500L was able to be cleaned up. The rest of the spill went under the building and into the ground. Due to migration of the spill to under the building it was impossible to clean up the rest of the 1000L of glycol.

The Spill Report states that

“The floor drains lead into the environment, accumulation beneath the building, and then likely to melt-out during the spring melt (late June). Unfortunately, there is no access underneath or around the operational building and concrete slab foundation.”

and

“DND/Nasittuq will need to monitor the downgradient external site(s) for spill impact (seepage) this spring melt.”.

This raises two concerns of note. The first is the potential for future reoccurrence of a glycol spill. CIRNAC requests any plans DND/Nasittuq may have developed to improve the infrastructure and/or reduce the likelihood of another spill. The second is that there is now Glycol within the environment, which may spread during spring freshet. CIRNAC requests any plans DND/Nasittuq may have developed to ensure that the spill does not spread to any nearby waterbodies.

Recommendation:

(R-06) CIRNAC recommends that the licensee provide action plans to clean up or contain the spill as well as an action plan that would mitigate any future glycol spills.

7. Water Management and Containment Systems Lacking Infrastructure

Comment:

The Investigation into background lead (Pb) within meltwater, the surrounding environment and other locations at Canadian Forces Station (CFS) Alert report completed by RMC Green Team from March 2024 states that

“CFS Alert is located in a continuous permafrost region and lacks significant surface vegetation; therefore, runoff is the primary water drainage process at the site. Runoff at the main station flows primarily to the east into Dumbell Bay Inlet, which are joined to the Lincoln Sea. Potential sources of contamination include animal waste from



wildlife, as well as runoff from old petroleum barrels in the surrounding watershed, tank farm leachate, landfarm, dumps (active and inactive) and sewage.”

CIRNAC is concerned that areas like: the main station landfill, battery dump, millionaire’s dump and dump 3 do not have a water containment system or berm which may lead to contaminants entering water bodies.

The report goes on to state that

“During the site visit, the RMC Green Team’s initial observation was that the berms at ALT 8 Lower Airfield Tank Farm and ALT-9 Upper Tank Farm effectively contained the meltwater. The meltwater level was observed to be high (close to the height of a rubber field boot). However, at the Lower Airfield Tank Farm, the water gradually decreased over the course of the visit with temperatures around 1-degree Celsius ambient temperature. While some evaporation may occur due to the meltwater being exposed to sunlight for 24 hours/day, it is likely that seepage of water occurs through the gravel berms, affecting the surrounding area.”

CIRNAC is concerned that a spill or leak from the berm located at the tank farm may allow containments to make their way into nearby water bodies if it is not repaired. CIRNAC’s concerns have been previously documented in its Inspection Reports going back over ten years.

Recommendation:

(R-07) CIRNAC recommends that the licensee provide an action plan to correct the deficiencies in the identified infrastructure.

8. Follow up on the Water Management Plan

Comment:

CIRNAC’s first comment for the 2022 Annual Report was a request for an updated Water Management Plan in accordance to the water license Part D Item 10 and 11 which state that

“The Licensee shall submit for Board approval an interim Water Management Plan, by March 31, 2020, of the year following Licence issuance, that covers current Water use practices and address intervener’s comments and recommendations made during the licensing process.”

and



“The Licensee shall submit for Board approval an updated version of the Water Management Plan, by March 31, 2021, containing specific information on the water circulation and freeze prevention system, and that includes a site water balance, and addresses intervener’s comments and recommendations made during the licensing process.”

respectively.

CIRNAC is concerned that no updated Water Management Plan has been submitted with the intervener’s comments and recommendations and therefore the licensee may not be in compliance with the water license. An up to date Water Management Plan is essential to ensure water quality and quantity are maintained.

Recommendation:

(R-08) CIRNAC recommends that within 90 days, the licensee provide the required updated Water Management Plan in order to maintain compliance with the issued water license.

9. Follow up on 2019 Inspection Report

Comment:

The 2019 Inspection Report noted many deficiencies such as:

- A. The Sewage Terrace “is not an acceptable form of waste disposal as the facility is not operating as designed. DND is required by the licence to ensure controlled deposition is in order in Part D Item 8.”
- B. Dump 3 “... was noted that historic waste is protruding through the material used to cap this facility in the years past. The inspector was notified that all run off from this facility ends up in Parr Inlet located downstream from the facility, approximately 400 meters away.”
- C. The airfield fuel tank farm noting that “DND holds, on this site ALT-8, 6 fuel tanks within an unlined berm... During the inspection of this facility it was noted that signs of historic overflows are apparent with slumping throughout the berm walls. CFS Alert staff informed the inspector that in years past and in previous reports water from this facility has vanished. This leads to the inspector to believe that this facility is not operating as intended and potential unauthorized discharges have occurred with no quality control of potentially contaminated water. This is in contravention of the Act (Nunavut Waters and Nunavut Surface Rights Tribunal Act) NWNSRTA Section 12(1), (2) & (3). The inspector believes that water from this facility percolated through the berm wall to the east of the fuel storage facility downhill towards the contaminated



soil facility and through to the far east side of the facility filling it beyond capacity and breaching the northeast corner of the contaminated soil facility and releasing into the environment...”

- D. The landfarm is notated that “During inspection of this facility it was noted that the facility appeared to be at full capacity. It was also noted that the northeast corner of the berm containing the contaminated soil has washed out due to water levels being too high for the berm wall to contain ... This is an unauthorized discharge of contaminated water and in contravention of the Act NWNSRTA Section 12(1), (2) & (3) The inspector is request CFS Alert to repair the damaged berm prior to further deposition of contaminated soil into this facility. This event also fails to satisfy Part D Item 11 of the licence which states “Effluent discharged from the Fuel Storage Facilities and the Landfarm at monitoring program stations ALT-8, 9, 10 and 11 shall not exceed the following Effluent quality limits”. With the release of material from this facility a contaminated soil farm the inspector believes that the substance fails to meet criteria in Part D Item 11 of the licence. The substance can be classified as a hazardous substance and must be disposed of off-site. Failure to adhere to this request will result in further enforcement action by CIRNAC to ensure compliance”
- E. The Day Tank Farm has become compromised as there are tracks leading on and through the berm and notes that “DND is reminded that this activity compromises the structural integrity of the berm walls and could lead to an unauthorized release of fluid from this facility.”
- F. Contaminated Soil Adjacent to the Day Tank Farm “... appears to be in an unusable condition. The liner beneath the berm intended for contaminated soil is no longer an impermeable layer separating the contaminated soils from the environment...The Inspector was notified that contractors unknowingly damaged this facility. The inspector was also notified that the facility was not in commission during this time.”

CIRNAC notes these as concerns that have all been identified as deficiencies which may led to contaminates in nearby water bodies.

Recommendation:

(R-9) CIRNAC recommends that the licensee provide an update to the issues noted within its 2019 Inspection Report.