MUNICIPALITY OF SANIKILUAQ

Operation & Maintenance Plan for Municipal Water Licence: Sewage Disposal Facilities

August 2026

Document Control

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September, 2014	Operation and Maintenance Manual: Water Truck Fill Station (Volume I & II)	N/A	Original Document
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1.0 Site Description

Date this plan was prepared: 2026-08 -28

1.1 Location of the Sewage Disposal Facility (SDF)

Municipality:	Municipality of Sanikiluaq
Latitude:	56° 32' 34.50" N
Longitude:	79° 14' 57" W
Proximity to Town:	2.9 km, West



Figure 1: Sanikiluaq Sewage Disposal Facility from Google Earth, July 8, 2006

1.2 SDF Site Summary

Year of commissioning the SDF: N/A

Design life of the SDF: N/A

1.2.1 Site History

The Hamlet of Sanikiluaq is located on the North end of Flaherty Island in the Belcher Islands of Hudson Bay. The population was approximately 856 people as of 2014. The community utilizes trucked services for both water delivery and sewage collection. All municipal wastewater is collected by vacuum trucks and transported to the existing natural sewage lagoon (Annak Lake), which operates without a fully contained structure. Historically, the lagoon has never been pumped out and the sludge has never been tested. The solid waste disposal area is also located near the sewage lagoon.

1.2.2 Ground Conditions

The surficial material in the area is dominantly glacial till, with common bedrock exposures and fine-grained sediments deposited by glacial action. The community is situated within a zone of widespread discontinuous permafrost. Beneath a thin active zone, most of the subsurface material is permanently frozen to a substantial depth.

1.2.3 Treatment System

The treatment system consists of a natural retention cell (Annak Lake) with a capacity of 19,360 cubic meters. Because it is a natural ditch and under capacity, complete decanting is never achieved, and a certain depth of liquid always remains. The North-West side of the lagoon has no berm and is level with the surrounding wetlands. As a result, the facility automatically overflows, and liquid continuously flushes into the well-vegetated wetlands during the summer until freeze-up. The final receiving water body is Eskimo Harbour (part of Hudson Bay), which is located about 1 km from the lagoon. The effluent stream merges with a natural stream before reaching the harbor.

2.0 Staff

2.1 Chief Administrative Officer

Name: Daryl Dibblee

Phone: (867) 266-7900

Email: N/A

Responsibilities:

The CAO manages the municipal staff to ensure that:

- Proper operation of the SDF is carried out
- Sampling and inspections are completed
- Information under the water licence monitoring program is provided to the Government of Nunavut Department of Community and Government Services (GN-CGS) for Annual Report preparation
- Submission of the Annual Report for the Nunavut Water Board (NWB)
- Having overall responsibility for the waste disposal site
- Overseeing the operation and maintenance personnel
- Taking full responsibility for actions under the emergency procedure during a service disruption (e.g., if the road to the lagoon is inaccessible).
- Handling all media and public inquiries regarding spills.

2.2 Foreman

Name: Kenny Pearce

Phone: (867) 266-7900

Email: publicworks@sanikiluaq.ca

Responsibilities:

- Daily operations and maintenance of the SDF.
- The sampling program at the monitoring stations
- Maintaining signage at the SDF and monitoring stations
- Annual decanting of the lagoon effluent into the adjacent wetland treatment area

2.3 Solid Waste Truck Drivers

Name: Various

Phone: N/A

Email: N/A

Responsibilities: The sewage vacuum truck drivers collect sewage from holding tanks within the municipality. Sewage is transported to the lagoon where it is deposited.

3.0 Health and Safety

All personnel working within the SDF must follow the Nunavut Safety Act and be made aware of potential health hazards associated with working around sewage and wastewater. This is imperative so individuals make a conscious effort to perform all necessary safety procedures to protect themselves, their co-workers and family members at home. Safety precautions include:

- Ensure all equipment is kept as clean as possible;
- Assume anything touched by sewage is contaminated;
- Protective clothing such as coveralls, gloves, boots, and safety glasses are to be provided to personnel and always worn when working around sewage;
- Workers must always wear protective gloves
- Work clothing is not worn home
- Workers must wash their hands with soap and water on a regular basis, especially before delivering drinking water, eating and before going home;
- Workers are prohibited from eating or drinking in and around the sewage vacuum trunks; and
- Workers must keep their vaccinations up to date.
- Personnel responsible for the sewage treatment and disposal facility must be trained in Workplace Hazardous Materials Information System (WHMIS), Transportation of Dangerous Goods Act and Regulation (TDGA and TDGR), and First Aid.
- Workers must be familiar with the spill response plan.
- Copies of a list of emergency procedures and equipment should be kept in all sewage trucks and the common work area.
- In all emergency response cases (such as a spill or fire), personnel must place their own personal safety as the highest priority.

4.0 Security and Control

Access Control of to the facility:

- Perimeter fencing around the SDF
- Signage
- 450 m restricted land use development setback surrounding the SDF

5.0 Wastewater Conveyance

Wastewater transportation: Vacuum Truck
Annual volume of sewage collected: Reported in Annual Report
Number of days per week sewage is collected: 7

5.1 Operations

- Sewage is collected 7 days a week from holding tanks at residential and commercial buildings using a sewage vacuum truck (with a capacity of approximately 10,000 L).
- The vacuum truck operates approximately 6 to 20 trips per day depending on daily household service needs.
- Sewage is transported into the lagoon site and offloaded via the truck pad's discharge chut over the splash pad into the sewage lagoon cell.
- Bollards are positioned at the offload location for safety while the truck backs up and opens its release valve.
- The volume of sewage discharged into the lagoon is estimated to be equal to daily municipal water consumption rates.
- Full sewage trucks should not remain idle for extended periods during winter to prevent holding tanks and discharge valves from freezing.

5.2 Influent Volume

Table 1 **Wastewater Generation Estimates**

Year	Estimated Wastewater Volume (m^3)	Difference (%)
2015	30947	0
2016	31590	2.03
2017	32198	1.89
2018	32818	1.68
2019	33378	1.59
2020	33917	1.59
2021	34466	1.50
2022	34992	1.52
2023	35531	1.52

6.0 SDF Design

Lagoon Capacity:	19,360 m^3
Lagoon Dimensions:	Undefined
Wetland Treatment Area:	Undefined
Effluent Path Length:	1,000 m
Discharge Method:	Natural decanting / uncontrolled overflow
Final Receiving Body:	Eskimo Harbour
Type of Receiving Environment:	Marine (as it is a part of Hudson Bay)

An overview of the wastewater treatment process:

Municipal wastewater is transported by vacuum trucks and discharged into Annak Lake, which serves as a natural lagoon. Because this lagoon is currently under capacity and lacks a berm on its North-West side, it is level with the surrounding environment and does not function as a fully contained structure. Consequently, the facility automatically undergoes uncontrolled overflow, continuously flushing liquid into the adjacent wetlands throughout the summer until freeze-up occurs. The effluent then travels through this well-vegetated wetland, merges with a natural stream, and flows as a single meandering stream until it ultimately reaches Eskimo Harbour.



Table 2 Seasonal Effluent Flow Through the Wetland Treatment Area

Description of the Final Receiving Environment:

The final receiving environment for the effluent is Eskimo Harbour, which is a part of Hudson Bay located approximately one kilometer from the lagoon. Because the existing solid waste disposal sites are situated in close proximity to the lagoon, there is a strong possibility that leachate from these waste sites also enters this final effluent stream before it reaches the harbor. Please keep in mind that the 2014 Operation and Maintenance manual does not specify the types of aquatic life present in this marine environment; if your new report requires this detail, you will need to reference a local biological study or environmental assessment.

7.0 Effluent Discharge

Discharge Method:	Passive Exfiltration
Time of Decant:	Summer months through late fall (until freeze-up)
Duration of Decant:	Continuous throughout the summer season
Average Discharge Flowrate:	350 m^3/d

Description of Effluent Sampling Procedures:

Wastewater grab samples are collected at designated station SAN-4 (located where effluent discharges into the wetland) weekly during lagoon overflow. Raw wastewater samples are also collected directly from sewage trucks four times during the summer months to establish baseline quality. All samples must be collected in accredited laboratory bottles, preserved properly, and shipped within 24 hours to ALS Laboratory in Winnipeg, MB for chemical, bacteriological, and heavy metal testing. Local operators will be trained on proper field protocols, quality control, and safety (including wearing protective gloves) to ensure valid data collection.

Description of Operations:

Daily: Collect and transport wastewater from holding tanks to the lagoon; clean any offload spills immediately; clear snow from access roads and truck pads as needed in winter; update O&M log sheets.

Weekly: Perform visual checks of berms, dykes, and drainage courses for erosion or blockages; monitor surrounding thermistor areas; execute weekly effluent sampling program at SAN-4 during overflow periods.

Monthly: Perform required access road and truck pad maintenance; record thermistor readings; confirm location and legibility of site signage.

Annual: Monitor natural decanting/overflow in the fall; execute annual geotechnical and dam safety review of berm structures; grade and reshape the access road and truck pad; submit annual monitoring and operational reports to the Nunavut Water Board.

8.0 Maintenance

Overview of Maintenance Activities:

- Annual inspections will be undertaken by Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) accompanied by a licensee from the Municipality of Sanikiluaq and/or a licensee representative from GN-CGS. The inspection report and recommendations will be reviewed by a GN-CGS municipal engineer and submitted in the Annual Report submitted to the Nunavut Water Board (NWB).

- Regular visual inspections by municipal staff of the:
  - Offload chutes
  - Lagoon berms
  - Signage

- Facility & Equipment Maintenance:
  - Grading, smoothing, and reshaping the access road and truck offload pad at least twice per year.
  - Clearing snow from the access road and turn-around pad during winter while ensuring berms and surrounding structures are not damaged.
  - Removing spilled or frozen wastewater alongside snow during winter clearing operations and transporting it to the appropriate disposal site.
  - Checking daily for blockages, frozen lines, or erosion on the upstream slopes of the berms and offload chute.
  - Performing immediate repairs and routine maintenance on sewage collection trucks and holding tanks to prevent winter freezing.
  - Executing annual geotechnical dam safety reviews during the summer by a qualified engineer.

Any issues identified by municipal staff must be reported to the regional municipal engineer. Follow-up actions will be undertaken by the municipality with support from the GN-CGS.

Sludge Management:

The sludge blanket is monitored as part of the annual discharge procedure. Historically, sludge from the lagoon has not been tested or pumped out. However, a sludge accumulation study may be conducted at approximately 10-year intervals to evaluate the need and frequency for removal. If lab analytical results (specifically BOD_5 and TSS) from the discharge point fail to comply with water license standards, a sludge removal study will be initiated earlier. When

testing sludge to confirm suitability for land disposal, samples must be collected across a grid of no less than 10 m by 10 m.

Surface Water Management:

Runoff from the Sewage Disposal Facility is monitored on an annual basis so that grading directs surface water away from the lagoon berms.

At some point, for a variety of reasons, impacted surface water may accumulate SDF. The water may or may not be impacted contaminants from sewage. In the event this occurs, the following procedures will be followed:

1. Collect samples from the water licence monitoring program at stations as outlined in the Environmental Monitoring Program and QA/QC Plan. It is recognized that it may take some time for results to be received from the accredited laboratory.
2. Analyze samples for parameters of concern and compare the results to the relevant Canadian Water Quality Guidelines.
3. Water should be inspected for odours, stain, or signs of visible impact (sheens, floating scum).
4. Consult with the GN-CGS municipal engineer and CIRNAC on discharge options.

9.0 Monitoring

Regulatory Inspection: The annual CIRNAC inspection will take place accompanied by the licensee from the Municipality and/or with a licensee representative from GN-CGS. The inspection report will be reviewed by a GN-CGS municipal engineer and submitted with the annual report.

Table 2 License Requirements Related to O&M of the SDF

Requirements	Reported
Monthly and annual quantities of wastewater disposal	Annual report submitted to NWB
Notice of commencement of monitoring program and observed flow	Notice given to the CIRNAC inspector
A summary of modifications and/or major maintenance work carried out on the SDF	Proposal submitted to NWB 60 days prior
A list of spills and unauthorized discharges.	Annual report submitted to NWB
A summary of any studies requested for the SDF and future planned studies planned	Annual report submitted to NWB
Monitoring Program Station SAN-4 shall not exceed the effluent quality limits: 120 mg/L BOD_5 180 mg/L TSS 1 X 10^6 CFU/dl Fecal Coliform No visible sheen of Oil and grease 6-9 pH	Annual report submitted to NWB
A freeboard of 1.0 m in the lagoon must be maintained	Annual report submitted to NWB
Number of operational days per year for the existing and emergency sewage disposal facilities.	Annual report submitted to NWB
Total number of sewage vacuum truck trips made to each disposal facility.	Annual report submitted to NWB

Requirements	Reported
Exact start and end dates for annual lagoon decanting/discharge.	Annual report submitted to NWB
Detailed dates and descriptions of all routine and non-routine maintenance activities.	Annual report submitted to NWB
Records of any spills, including date, estimated volume, location, and remedial actions taken.	Annual report submitted to NWB
Annual Geotechnical and Dam Safety Review reports submitted by a qualified engineer.	Annual report submitted to NWB

Table 3 **Monitoring Program Station Location and Description**

Station	Description	Latitude	Longitude
SAN-4	Influent of Wastewater-to-Wastewater Facilities at the point of discharge into the wetland.	56° 32' 34.50" N	79° 14' 57" W

10.0 Modifications and Upgrades

Planned modifications or upgrades:
As the existing natural lagoon (Annak Lake) is under capacity and lacks complete structural containment, all raw sewage continues to be deposited into the existing natural ditch until a new facility is built and commissioned. Future planned infrastructure upgrades include the construction of a new sewage treatment facility to replace the current system. Until the new plant is operational, excess sewage will continue to overflow into the adjacent wetland during summer months. Additionally, an analytical sludge accumulation study is recommended to be conducted approximately every 10 years (or sooner if effluent quality non-compliance occurs) to determine requirements and frequency for future sludge removal and disposal operations.

11.0 Previous Reports

- "Operation and Maintenance Manual for the Existing Sewage Lagoons," Community and Government Services, Government of Nunavut, September 2014.

Appendix A

Photographs



Figure 2 – Image of Sewage Lagoon