MUNICIPALITY OF ARCTIC BAY

Operation & Maintenance Plan for Municipal Water Licence: Solid Waste Disposal Facilities

March 2025

Document Control

Date	Document Title	Author	Details
January 2015	Solid Waste Operation and Maintenance Plan for Hamlet of Arctic Bay	Unknown	Previous manual
November 2024	Municipality of Arctic Bay Operation & Maintenance Plan for Municipal Water Licence: Solid Waste Disposal Facilities	GN-CGS and Dillon Consulting Ltd.	Consolidation and update of information and previous manuals into a standardized template.
March 2025	Municipality of Arctic Bay Operation & Maintenance Plan for Municipal Water Licence: Solid Waste Disposal Facilities	GN-CGS	Added best management practices from the GN's *Environmental Guideline for the Burning and Incineration of Solid Waste*

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1.0 Site Description

Date this plan was prepared: 2024-Nov-16

1.1 Location of the Solid Waste Disposal Facility (SWDF)

Municipality: Arctic Bay
Latitude: 73º02’11”N
Longitude: 85º04’58”W
Proximity to Town: 2.12 km East
Landfill Dimensions: Undefined
Metal Waste Area Dimensions: Undefined

Figure 1: Arctic Bay Water Solid Waste Disposal Facility. Google Earth, 2024

1.2 SWDF Site Summary

Year of commissioning the SWDF: Unknown

Design life of the SWDF: Unknown

1.2.1 Site History

The Municipality of Arctic Bay is located on Borden Peninsula; Baffin Island, Nunavut. The population in 2021 was 994 (Statistics Canada). They municipal infrastructure present in the community includes a water supply facility, single cell sewage lagoon, and a solid waste disposal facility. The waste management facility of the community is non-engineered.

The municipality keeps metals and hazardous wastes at the left side and domestic wastes (landfill) at the right side of the access road towards the sewage lagoon. The hazardous wastes are segregated and stored in a sea can for future disposal in the South. The municipality has enough sea cans to store future hazardous wastes temporarily prior to shipment. The average waste generation rate is considered 0.015 m^3/person/day and for an estimated population of 966 in 2024, approximately 5289 m^3 of waste is expected.

2.0 Staff

2.1 Chief Administrative Officer

Name: Andre Larabie

Phone: 867-438-9917

Email: cao@arcticbay.ca

Responsibilities:

The CAO manages the municipal staff to ensure that:

- Proper operation of the SWDF 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

2.2 Foreman

Name: Sam Willie

Phone: 867-439-8260

Email: foreman@arcticbay.ca

Responsibilities:

- Daily operations and maintenance of the SWDF
- Managing waste collection
- Proper segregation of waste
- Compacting and burning of waste
- Completing inspections and other maintenance activities
- The leachate sampling program at the monitoring stations
- Maintaining signage at the SWDF and monitoring stations

2.3 Solid Waste Truck Drivers

Name: Various

Phone: N/A

Email: N/A

Responsibilities: The drivers collect solid waste within the municipality from storage containers and deliver it to the SWDF.

3.0 Health and Safety

All personnel working within the SWDF must follow the Nunavut Safety Act and be made aware of potential health hazards associated with working around solid waste. 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
- Protective clothing such as coveralls, gloves, boots, and safety glasses are to be provided to personnel and always worn when working around waste
- 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 must keep their vaccinations up to date

4.0 Security and Control

Access Control of to the facility:

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

5.0 Facility Operations

5.1 Municipal Waste Disposal

Municipal Waste Collection:	Trucked pick-up
Other Waste:	Drop off
Number of days per week waste is collected:	5
SWDF Type:	Natural attenuation

Type of waste received at the SWDF:

- Municipal solid waste (MSW)
- Bulky metal waste
- Hazardous
- Industrial, construction and institutional

Overview of the SWDF:

The MSW disposal area is partially fenced and the Hamlet presently does not limit who disposes of waste and where. Proper waste segregation is imperative to the long-term operation of the facility as it helps ensure potential human health and environmental hazards are minimized, un-compactable wastes (e.g., bulky metal wastes) are kept out of the landfill.

The MSW disposal area is a natural attenuation landfill. This means that the landfill is not lined and small amounts of contaminants can enter the surrounding environment to be naturally broken down. In this type of landfill, the rate that contaminants enter the environment is expected to occur at a rate such that contaminants can easily be broken down and the surrounding environment is not overwhelmed. Natural attenuation landfills also rely on permafrost aggrading into the covered waste cells of the landfill and eventually freezing them. However, as contaminants are able to freely enter the environment in this type of landfill, proper waste segregation is important to ensure harmful contaminants are kept out of the landfill.

Initial waste segregation should begin at the community's residences and other buildings, ensuring residents and business are familiar with acceptable wastes for the MSW disposal area. Household hazardous or bulky wastes are kept out of the landfill and Burn Area. The Waste Truck Driver should be familiar with operational procedures for the MSW disposal area, acceptable wastes for burning and landfilling and proper waste segregation practices. Ultimately the Foreman is responsible to ensure proper waste segregation occurs.

Generation Data:

The average waste generation rate is considered 0.015 m^3/person/day and for an estimated population of 966 in 2024, approximately 5289 m^3 of waste is expected.

Operations:

- The SWDF needs to be properly signed to inform operators and residents of the correct location to dispose of or store certain wastes. At a minimum, the SWDF should have disposal/storage areas for:
  - Domestic non-burnable waste (for landfilling)
  - Hazardous waste
  - Bulky Metal waste
  - Domestic burnable waste
- The waste truck driver collects MSW from community buildings five times per week. The non-compactor truck is used to collect and transport municipal waste to the SWDF.
- The Waste Truck Driver is also responsible for ensuring collected waste is properly segregated and refusing the collection of hazardous waste if present. If properly trained, this individual may also be required to operate heavy equipment within the solid waste disposal facility

5.2 Open Burning

Operations:

- Wastes for burning are identified and separated. Burning should only occur at the designated location at the SWDF and when winds are light and blowing away from the community. To prevent incomplete combustion and/or leachate from contaminated ash residual from impacting any surrounding waters, waste that cannot be burned includes:
  - Non-wood building / construction materials (e.g. Styrofoam, roofing materials, electrical wire, insulation, plastics, asbestos, etc.)
  - Treated wood (e.g. telephone poles, pilings, cribbing, foundation wood)
  - Asphalt & asphalt products
  - Tires
  - Hazardous wastes
  - Waste paint
  - Fuel & lubricant containers
  - Aerosol cans & other compressed gas containers (e.g. propane tanks)

- Staff shall burn municipal waste in accordance with the GN's Environmental Guideline for the Burning and Incineration of Solid Waste (2012):

  - Wastes that can be safely open burned include: paper products, paperboard packing including boxboard and carboard, untreated wood including lumber and plywood, and natural fiber textiles.
  - Anything that can be done to reduce the moisture of waste burned will decrease the amount of smoke produced and increase the completeness of combustion. Waste should be covered or stored inside sheds or other secure buildings to keep rain and snow out of the waste. This will also lessen the opportunity for wildlife to access the waste. If wet waste must be burned, the wet waste should be mixed or layered with dry waste to reduce the overall moisture content of the waste burned.
  - Large quantities of dark smoke indicate problems and inefficiencies with the combustion process and the generation of pollutants.
  - If waste is to be open burned on the ground, the use of deep or steep-walled 'pits' should be avoided as this will prevent the necessary turbulent mixing of oxygen with the burnable gases.
  - Any bottom ash not meeting the criteria set out in the *Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities* is considered to be a hazardous waste. This ash is not suitable for landfilling and its management must comply with the *Environmental Guideline for the General Management of Hazardous Waste*.
  - Keep records of when, how much and what waste was burned, how the waste was loaded into the burning device or incinerator, the amount of smoke and bottom ash generated, how the fire was started and any other information that would help remind the operator of what worked well, and what didn't.

- The Municipality will also apply for a permit to burn through the Fire Department. Controlling the open burn is extremely important to reduce the risk of uncontrolled fire and hazards to the public, employees, and the surrounding environment.

- The weather forecast must be checked prior to any burning. If heavy rain is or will be present, burning should be postponed (burning during heavy rain events may result in poor or incomplete combustion and the potential to generate harmful contaminants). Confirmation of wind speed and direction prior to any burning. If loose debris can be carried by the wind, burning should be postponed.

- The SWDF must be closed to the public during burn events

- Burning only in the designated burn area and ensuring burning does not occur in landfill piles.

- Presence of an attendant during initial stages of the burn and periodic inspection of the burn once it has been established.

- Maintaining a minimum of 5 m buffer zone around the burning area and all ensuring attendants or personnel remain upwind of the burn area.

- Confirmation the waste is no longer hot or burning prior to the addition of more waste or covering with granular material. This can be accomplished by moving around the ash and remaining materials to ensure the fire is out and material can cool.

After every burn, once the MSW is confirmed to be cold and not burning, the CAT bulldozer should push the ash and remaining material to the landfill tipping face.

5.3 Hazardous Waste Management

Hazardous wastes are those that are known to be dangerous due to their chemical, physical or biological properties, are no longer used for their original purpose, and are intended for recycling, treatment, disposal, or storage. All hazardous wastes require special handling, storage, and disposal methods to prevent human health and environmental exposure.

The Environmental Guideline for the General Management of Hazardous Waste (GN, 2010) provides information regarding the proper management of hazardous waste in Nunavut. The generator of any hazardous waste is ultimately responsible for ensuring it will be properly managed from is creation to its disposal. Generators typically use carriers to transport the hazardous waste to appropriate receivers for disposal.

The bulk metal/hazardous waste storage area is currently used to store hazardous wastes from the community. This area is filled but not bermed or lined and runoff from the facility presently flows into the sewage treatment wetland. If use of this area is to continue for storage of hazardous wastes, it is recommended that an engineered berm and liner system be installed as this will limit the amount of potentially hazardous leachate entering the surrounding environment.

The following hazardous waste operations and maintenance procedures deal with household hazardous wastes (HHW) only. Typical HHW which may be found in Arctic Bay include:

- Pesticides and herbicides
- Paint

- Solvents (e.g., paint cleaners)
- Flammable liquids
- Corrosive cleaners
- Batteries (wet and dry cell)
- Used fuel and oil
- Corrosive Explosive Flammable Poison
- Certain items considered HHW cannot be stored at the MSW disposal facility, however. These include:
    - Ammunition, flares and explosives (including fireworks) – contact the RCMP for proper disposal
    - Prescriptions, medications, and bio-hazardous wastes (includes syringes) – dispose of these at the Nursing Station and/or Health Care Centre
    - Reactive chemicals – contact the GN-DOE (Government of Nunavut-Department of Environment) office for disposal options

Contaminated soil can be accepted in a designated area and is typically stored in 205 L steel drums or bags approved for contaminated soil storage and must be shipped out of the municipality. Private entities responsible for creating the contaminated soil must contact the CAO to discuss storage options and provide a plan to ship the contaminants out of the municipality. The decision to store contaminated soil from industrial sources rests with the municipality.

Operations:

- The SWDF needs to have an area set aside as a hazardous waste storage area. This area should be fenced with a lockable gate and have appropriate storage options for expected HHW. This area also needs to be properly signed as the “Hazardous Waste Storage Area”. Proper signage helps operators, as well as the general public when residents arrive to dispose of their wastes. This area is intended for storage only, not disposal.

- The bulk metal/hazardous waste storage area is intended for storage only, not disposal. It is expected that hazardous wastes will be stored for up to five years. This should be sufficient time for the community to build up enough waste to make it economical for a back haul out of the community to a licensed waste receiver.

- Since the SWDF is generally accessible to the public, residents can come and drop off HHW throughout the year. However, the general public should not have direct access to the Hazardous Waste Storage Area for health and safety reasons. A designated public drop-off

area for HHW should be used. The public drop-off area should be tended to regularly by the Foreman.

- Inspection of the hazardous waste storage area should occur weekly inspections by the Foreman.

5.3.1 Storage

Hazardous waste storage containers are designed to hold, store and transport small quantities of waste. Many different types of containers are available (i.e. barrels, bottles, bags and boxes) and are made from a variety of materials (i.e. aluminum, plastic, steel, and stainless steel). Selecting the proper container requires an understanding of the properties of the waste to be stored. If transport is to be undertaken, the generator should consult the Transport Authority to confirm the container meets all legislated requirements. The following are additional general points for consideration:

- Hazardous waste should be stored in their original containers where possible or in containers specially manufactured for the purpose of storing hazardous waste. The containers must be sound, sealable and not damaged or leaking. Sea can is the best option.
- Containers should be clearly labeled to identify their contents according to requirements of the Workplace Hazardous Materials Information System (WHMIS) and the relevant Transport Authority, if transport is planned.
- Small quantities of compatible hazardous waste should be bulked into 16 gauge or equivalent metal or plastic 205 litre (45 gallon) drums for the purpose of secondary containment.
- Containers should be closed and sealed at all times, except while waste is being added or removed.

It is important to know which types of waste do not mix well when storing them. This helps prevent violent, explosive reactions and toxic fumes. To store wastes safely, different systems have been created. One example is the 'Hazardous Waste Compatibility Chart' adopted by the United States' Environmental Protection Agency.

All HHW collected needs to be properly stored in sea cans to minimize any environmental and human health hazards. The GN-DOE provides information on proper storage of specific HHW; these include:

- **Antifreeze** – use original containers where possible, or bulk-store waste antifreeze into good condition 16 gauge or lower gauge steel or plastic 205 L drums.
- **Batteries** – bulk-store waste batteries into good condition 16 gauge or lower gauge steel or plastic 205 L drums, or other form of containment away from weather; wooden pallets should be used to keep batteries and containers off the ground during storage and transport.
- **Fluorescent light tubes/compact fluorescent light bulbs** – use original containers where possible and prevent breakage of light tubes/bulbs; keep away from weather.
- **Ozone Depleting Substances (ODS)** – do not landfill; wastes with ODS (i.e., refrigerators and refrigeration equipment, vehicle air conditioners, ODS-containing fire extinguishers (typically purchased before 1997) should be diverted to the bulk metal waste disposal area. The Hamlet can hire technicians to remove ODS from stored equipment.
- **Paint** – use original containers where possible, or bulk-store compatible paints into good condition 16 gauge or lower gauge steel or plastic 205 L drums; do not mix different types of paint (i.e., alkyd and latex).
- **Solvent** – use original containers where possible, or bulk-store compatible waste solvents into good condition 16 gauge or lower gauge steel or plastic 205 L drums.

As the Hamlet currently stores waste oil in drums at the bulk metal/hazardous waste storage area (if not burned within BLCS' waste oil burners), it is recommended they register the site as a hazardous waste storage facility with the GN-DOE Environmental Protection Services (R. Eno, pers. comm.).

5.3.2 Classifications of Dangerous Goods:

Class 1 – Explosives

Class 2 – Compressed Gases
Division 2.1 – Flammable Gases
Division 2.2 – Non-flammable and Non-toxic Gases
Division 2.3 – Poison Gases
Class 3 - Flammable Liquids
Class 4 – Flammable Solids
Division 4.1 – Flammable Solids
Division 4.2 – Spontaneously Combustible
Division 4.3 – Water Reactive
Class 5 - Oxidizing Substances and Organic Peroxides
Division 5.1 – Oxidizing Substances

Division 5.2 – Organic Peroxides

Class 6 - Toxic and Infectious Substances

Division 6.1 – Toxic Substances

Division 6.2 – Infectious Substances

Class 7 - Radioactive Materials 2

Class 8 - Corrosives

Class 9 - Miscellaneous

1. Class 1 substances (Explosives) are regulated by Natural Resources Canada under the Explosives Act.

2. Class 7 substances (Radioactive Materials) are regulated by the Canadian Nuclear Safety Commission under the *Nuclear Safety and Control Act and Nuclear Liability Act.*

6.0 Maintenance

Overview of Maintenance Activities:

- Annual inspections will be undertaken by Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) accompanied by a licensee 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:
  - Berms
  - Fence
  - Signage
  - Presence of water runoff in the SWDF

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

7.0 Monitoring

Regulatory Inspection:

The annual Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) inspection will take place accompanied by the licensee from the Municipality and/or with a licensee representative from GN-CGS. The inspection will be reviewed by a GN-CGS municipal engineer and submitted with the annual report.

Table 1: Licence Requirements Related to O&M of the SWDF

Requirements	Reported
The Licensee shall sample at Monitoring Program Station ARC-9 annually during periods of runoff or seepage.	Reported in Annual Report

Table 2: Monitoring Program Station Description and Locations

Station	Description	Latitude	Longitude
ARC-9	Runoff from the Solid Waste Disposal Facility	72º03’04”	85º04’57”

8.0 Surface Water Management

At some point, for a variety of reasons, impacted water may accumulate in the landfill, hazardous waste storage area, or the bulky metals area. The water may or may not be impacted by leachate, hazardous wastes, or contaminants from land farmed soil. In the event this occurs, the following procedures will be followed:

- 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.
- Analyze samples for parameters of concern and compare the results to the relevant Canadian Water Quality Guidelines.
- Water should be inspected for odours, stain, or signs of visible impact (sheens, floating scum).
- Consult with the GN-CGS municipal engineer and CIRNAC on discharge options.

9.0 Modifications and Upgrades

Planned modifications or upgrades:

There are currently no planned modifications or upgrades.

10.0 Previous Reports

- Solid Waste Operation and Maintenance Plan for Hamlet of Arctic Bay, 2015
- Hazardous Waste Segregation, Storage and Transportation Procedure Municipality of Arctic Bay, 2019

Appendix A

Site Plan


End of Life Vehicle Storage
Metals Disposal
End of Life Vehicle Storage
Hazardous Waste
Landfill
Google Earth
Image © 2024 Maxar Technologies
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