HAMLET OF SACHS HARBOUR

Solid Waste Facilities

Operations & Maintenance Manual

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1.0 Introduction

1.1 Purpose

The purpose of this manual is to assist the Hamlet of Sachs Harbour personnel in the proper operation and maintenance of the Hamlet's solid waste disposal facility.. The manual has been developed according to the requirements of the Inuvialuit Water Board water license (N7L3-1531).

The challenges facing the community to address the multiple risk factors at the solid waste site need to be mitigated by several measures and planned out by adopting a model of continuous improvement as outlined in the Environment Canada Guide for Solid Waste Management for Northern and Remote Communities (http://publications.gc.ca/collections/collection_2017/eccc/En14-263-2016-eng.pdf).

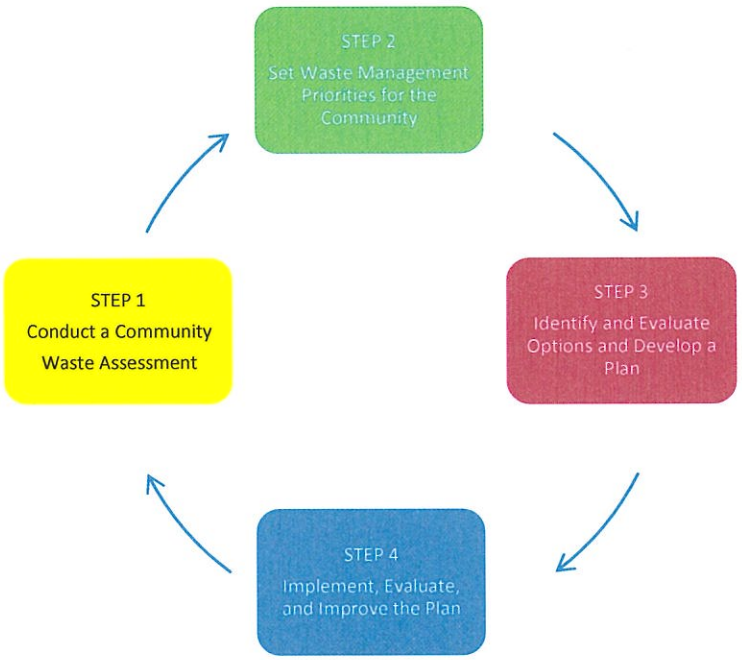


Figure 1: Continuous Improvement Approach to Waste Management Planning

1.2 Site Setting

Sachs Harbour (Jkahuak) is the northernmost settlement of the Northwest Territories, home to a small Inuvialuit community of approximately 117 people. It is located on the southwest coast of Banks Island in the Amundsen Gulf at 71°58' N and 125°14' W, 523 km northeast of Inuvik and 1158 km northwest of Yellowknife. The terrain around Sachs Harbour is comprised primarily of fine sands and sandy gravels which are susceptible to erosion during freshet. Thin tundra grasses and moss wear quickly underfoot, leaving little protection of the subsoils in occupied areas.

Sachs Harbour lies well within the zone of continuous permafrost. The mean annual air temperature is - 12.8°C. The climate is cold and dry, with February and July mean temperatures of -28.3°C and 6.6°C respectively. Total annual precipitation is 151 mm. Snowfall averages 97.7 mm per year, while rainfall accounts for 58.3 mm of total precipitation.

The current solid waste disposal is located 8 km west of the Hamlet, past the water treatment plant and lagoon. The site is accessed via a well-developed road that runs about 12 km along the coastal hills, extending from the Hamlet center to the communities' picnic site near the mouth of the Mary Sachs Creek. The road supports both the trucked collection of solid waste and sewage, hence it is graded in the summer, plowed in the winter and is generally well maintained. The solid waste site lies 150 m north of the road.

1.3 Hours of Operation

There is a gate at the entrance at the site to control access to the landfill. Public access to the site is open 24 hours a day throughout the year.

1.4 Contact List

The individuals responsible for the operation of the solid waste facilities in Sachs Harbour are the following:

Table 1: Contact List

Title	Name	Contact Number
Senior Administrative Officer (SAO)	Mr. Stephen Wylie	(867) 690-4351
Public Works Foreman	Mr. John Elanik	(867) 786-0120
Landfill Site Operator	variable	

2.0 Background and Design Data

2.1 General

Solid waste is collected twice a week and transported to the solid waste facility 8 km from the community. General domestic waste is placed in the active landfill cell while larger waste items are generally segregated and stored in fenced off area's separate from the domestic disposal area.

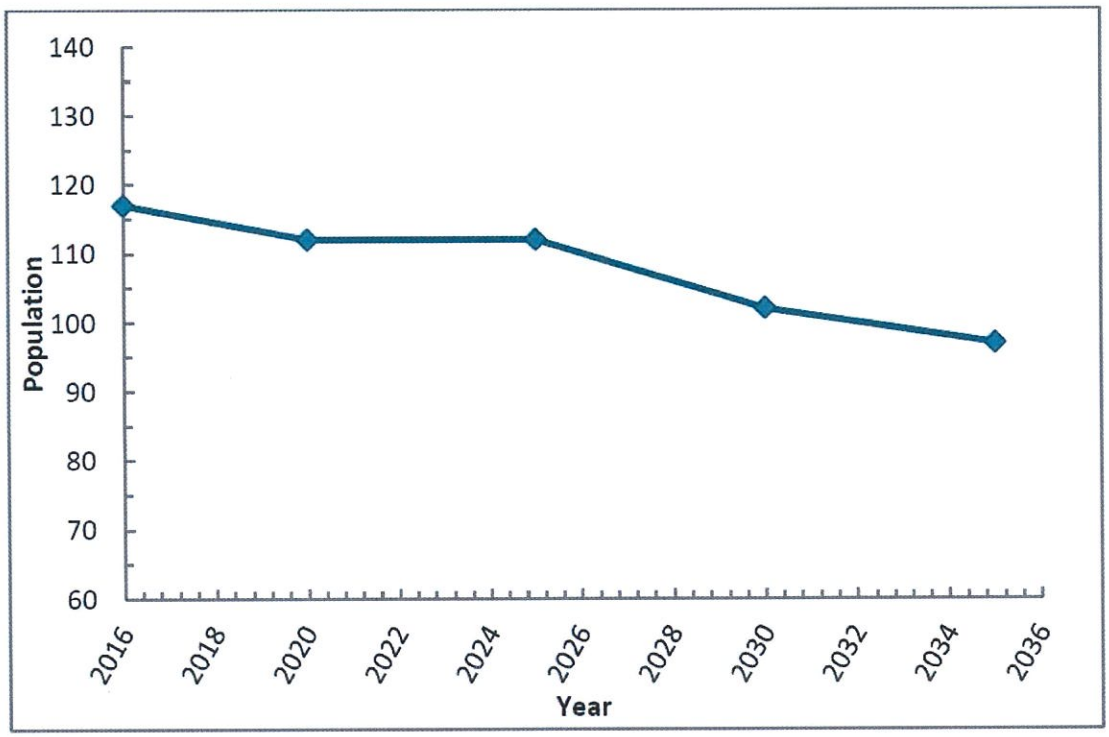
The landfill uses the area method for disposing waste. Due to limited capacity, the landfill has been expanded twice, and is currently facing another modification or potential expansion. The site is comprised of sandy soil with the surrounding terrain being largely characteristic of a polar semi-desert with localized areas of lush plant cover.

The site lies within the Mary Sachs River watershed and is in close proximity to several water bodies, including the Mary Sachs Creek (1.5 km) and Thesiger Bay (800 m) The site slopes northward towards a wet area (50 m) that drains into the creek to the northwest. Warmer temperatures and extended periods of precipitation during the summer months have resulted in soft ground conditions and areas of ponded water around the site.

2.2 Population Projections

Population projections for the community of Sachs Harbour have been developed using information from the NWT Bureau of Statistics. The projected population for the next 20 years (Figure 2) is based on data available in November 2016.

Figure 2: 20-year Population projection for Sachs Harbour (NWT Bureau of Statistics)



2.3 Solid Waste Production

Two community solid waste volume models have been commonly used in the NWT: one to estimate uncompacted solid waste volume generation (m^3) in any given year, and another for a given planning horizon. Section 2 of the "Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the NWT" (MACA, 2003) contains the formulas for estimating the volume of solid waste produced annually by a community based on population. The formulas used are shown in **Table 2** displays the resulting solid waste generation projection for the Hamlet of Sachs Harbour to 2040.

The projection is for uncompacted waste only. The estimated compaction rate for a modified landfill is 3:1 (Heinke and Wong, 1990). In practice, this rate varies widely but is the minimum

expected for compaction when following recommended operations practices. Waste compaction is conducted infrequently at the Sachs Harbour facility but is planned to increase from once a year to twice a year.

Table 2: Waste quantity generation for Sachs Harbour

Year	Calendar Year	Total Pop.	Daily Rate	Daily Volume	Projected Annual Weight	Projected Annual Volume	Annual Comacted Waste Volume	Volume of Cover	Compacted Waste Plus 5:1 Cover	Cumulative Compacted Waste Volume
			m^3pcd	m^3/day	ton/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3
1	2019	102	0.017	1.7	63	633	211	42	253	253
2	2020	98	0.017	1.7	61	609	203	41	243	497
3	2021	98	0.017	1.7	61	609	203	41	243	740
4	2022	98	0.017	1.7	61	609	203	41	243	984
5	2023	98	0.017	1.7	61	609	203	41	243	1,227
6	2024	98	0.017	1.7	61	609	203	41	243	1,470
7	2025	91	0.017	1.5	57	565	188	38	226	1,696
8	2026	91	0.017	1.5	57	565	188	38	226	1,922
9	2027	91	0.017	1.5	57	565	188	38	226	2,148
10	2028	91	0.017	1.5	57	565	188	38	226	2,374
11	2029	91	0.017	1.5	57	565	188	38	226	2,600
12	2030	79	0.017	1.3	49	491	164	33	196	2,797
13	2031	79	0.017	1.3	49	491	164	33	196	2,993
14	2032	79	0.017	1.3	49	491	164	33	196	3,189
15	2033	79	0.017	1.3	49	491	164	33	196	3,385
16	2034	79	0.017	1.3	49	491	164	33	196	3,581
17	2035	76	0.017	1.3	47	472	157	31	189	3,770
18	2036	76	0.017	1.3	47	472	157	31	189	3,959
19	2037	76	0.017	1.3	47	472	157	31	189	4,148
20	2038	76	0.017	1.3	47	472	157	31	189	4,337

NOTES:

1. Waste volumes are based on population and an average solid waste volume of 0.017m^3/c/day.
2. Weight estimates for uncompacted waste are based on a density of 0.099 tonnes/m^3
3. Volumes are for uncompacted solid waste including residential, commercial and industrial wastes.
4. Compacted volumes are based on a compaction rate of 3:1 (Heinke and Wong, 1990).

The total volume of **compacted** and **covered** waste produced over the next **20** years is calculated to be **5,313 m^3**. This will require approximately **50 m^3 of cover material** annually.

3.0 Solid Waste Facility

Figure 3 Intended layout of the solid waste site

3.1 Waste Receiving

The solid waste facility is to be organized into six (6) separate disposal areas:

1. Domestic wastes Approx 2,000 m2 (more frequent compaction and cover) twice a year between June and September.
2. Segregated Cells for Tires, Appliances, Reuseable Items Construction and Demoliton Debris, and Vehicles
3. Burn box for paper, cardboard and clean wood
4. Construction and Demolition Materials (less frequent compaction and cover) and End of Life Vehicles.
5. Historic Hazardous wastes (Oil drums and tanks)
6. Bulky Wastes, reuseable materials scrap metal, reuseable wood / items

The following is a summary of the various types of wastes to be disposed, waste receiving controls, burning operations, and cover operations..

Domestic Waste Area:

This is the largest disposal area at the landfill. General household wastes are placed here. The disposal area extends approximately 250m west of the access road and is approximately 200m wide. The area is surrounded by earthen berms approximately 1.5 m high. Fences have been installed which block the wind to prevent off-site migration of wind-blown debris. Fences can be improved.

Burn Box:

As per the Hamlet's Water Licence,The open burning of solid or liquid wastes is no longer acceptable (See **Appendix A**). An approved burn box shall be located in a separate area. Only clean combustible materials are to be disposed on in the burn pit, including paper, cardboard and clean wood.

Hazardous Wastes:

As per the Hamlet's Water Licence, these items are to be segregated and stored in a designated contained temporary storage area. in general accordance with the Guideline for Hazardous Waste Management. Contaminated soils and/or contaminated snow are to be contained in such a manner as to minimize the potential for migration of contaminants into any waters. The Hamlet is to contact the ENR Water Resource Officer prior to accepting, and notify the ENR Inspector if any, contaminated soil and/or snow is deposited at the facility.

A large stockpile of hazardous waste drums currently exists on-site, however the Hamlet is planning to remove this stockpile and prevent it from reoccurring.

Household hazardous waste only from residents is collected at the Hamlet garage. The Hamlet does not collect hazardous waste from the Industrial, Commercial, or Institutional sector.

Bulky Waste Area:

Large non-combustible items such as automobiles, snowmobiles, old furnaces, appliances and empty holding tanks are placed in the bulky waste disposal area. It consists of an area located directly north of the main bermed disposal area. Empty containers are defined in the Guideline for Hazardous Waste Management as follows:

A container from which all:

a) Hazardous waste has been emptied, to the greatest extent possible, using regular handling procedures. Its contents shall not exceed 0.1% of the container's original capacity or 0.2 litres, whichever is less. This does not include toxic gas in Class 2.3 of the TDGR or containers which previously came in direct contact with:

i. Substances in Class 6.1 Packing Group I materials of the TDGR; or

ii. Severely Toxic Contaminants.

b) Flammable vapours have been reduced to less than twenty percent (20%) of the lower explosive limit for the material by purging, venting, or by the introduction of an inert material.

3.1.1 Accepted Waste

Any waste disposal option has limitations with respect to the waste streams which may be handled in an environmentally safe manner. Limits must be placed on the types of waste accepted at a disposal site in order to protect the environment, the employees, the users and neighbours, as well as the equipment from damage, while simultaneously providing adequate levels of service.

The Site Operator shall allow only those materials to be deposited at the Sachs Harbour Landfill for which the facility has been designed, with the exception of unique circumstances reviewed in consultation with regulatory agencies.

Acceptable wastes for disposal are listed below:

- Non-recyclable plastic, metal, and paper wastes; packaging; cardboard; newsprint; food; rubber; leather; glass; wood; from residential, commercial or industrial premises:
- Animal and vegetable (organic) waste material;
- Sweepings, clothing and textiles, consumer electronics, and discarded household utensils;
- Furniture and major appliances;
- Non-salvageable metals;
- Tires; and
- Construction & Demolition wastes (provided the waste is not a hazardous or banned material).

3.1.2 Non-accepted Waste & Hamlet Discretion

Wastes which present a danger at the solid waste facility, require special disposal techniques, or may interfere with the level of service to the public, are not acceptable for disposal. In some cases, wastes which are acceptable in small quantities may not be acceptable in large quantities from a single generator because they may cause the level of service to other users to deteriorate and cause handling problems at the site and increased environmental liability (for example, Construction and Demolition Wastes).

To some extent, the acceptability of large quantity wastes must be at the Hamlet's discretion, depending on the ability to accommodate disposal without deterioration in the level of service. In cases where unacceptable wastes are identified, site staff will attempt to identify allowable management alternatives to material haulers.

All wastes which pose potential safety or environmental problems cannot be listed in their entirety. The Site Owner and site personnel in general must be wary of accepting wastes which could cause future operational problems and must watch for the inclusion of unacceptable wastes in regular loads of refuse.

The following items are not accepted for placement in the landfill:

- Pathological or Biomedical wastes
- Radioactive wastes
- Industrial, commercial, and institutional hazardous wastes

- Asbestos
- Any other materials not listed as acceptable or conditionally acceptable with the approval of the SAO.

3.2 Waste Inspection

The checking of waste entering the facility is crucial to the safe and correct operation of the landfill. The site operator should carry out random checks of the waste entering the facility and random waste inspection in the disposal area. The following methods are employed to minimize the quantity of unacceptable waste which is disposed at the site and to direct the waste hauler to the correct disposal area:

- Site operators will be watchful for unacceptable or potentially hazardous wastes during unloading;
- When personnel encounters suspect waste in the disposal area, landfilling shall cease until the material is segregated and appropriate action is taken;
- The Site Operator will inform the hauler that a random check is to be performed. If the hauler refuses, the vehicle will not be permitted entry to the site, and will be selected for a check on its next visit. The Site Operator will record as much information as possible about haulers who refuse a random check;
- The selected hauler will be directed to an area near the active landfill area that is separate from all other incoming waste. Prior to dumping, the driver of the inspected vehicle will confirm the absence of unacceptable materials. An inspector (the Site Operator or a delegate) will examine the load for hazardous or unacceptable wastes. Completion and results of the inspections shall also be noted in the daily checklist.

3.2.1 Handling Unacceptable Waste

Unacceptable wastes may be classified as non-hazardous, potentially hazardous or unacceptable, and depending on the time of discovery, may or may not be associated with a known hauler. Once a waste is suspected to be hazardous or unacceptable, the onus is on the hauler to demonstrate otherwise, or remove the waste at their expense. Repeat deliverers of unacceptable or hazardous wastes may be banned from the site at the discretion of and for a period determined by the SAO.

Once unacceptable waste is identified it is important to correct the situation as soon as possible. Solid waste site operator's need to communicate their observations to the SAO immediately. The site attendant will notify the SAO of anyone dumping unacceptable or rejected waste at the landfill site. The report shall contain the following information:

- Vehicle license number
- Type of vehicle
- Date and time of incident
- Name of offender, if possible
- Material dumped, or rejected

3.3 Segregation of Recyclable/Reusable Materials

All salvage rights lie with the Hamlet, who shall dictate if salvaging is permissible in disposal area other than the landfill area. Salvaging is encouraged by the Hamlet.

3.4 Site Equipment

The Hamlet provides all vehicles, equipment, buildings, materials, and fuel necessary for the operation of the landfill and the collection of wastes. The following equipment is available:

- Pickup trucks for regular hauling
- Light duty dump truck for fuel tanks and larger items (6.5 m^3)
- Loader (938 G&M Series Caterpillar)
- Bulldozer (D6 936 Caterpillar with bucket/plow blade)

3.5 Signage

The Solid Waste Facility must have a sign posted at the entrance to inform the public of the location of the Solid Waste Facility. The sign could also include the following current information:

- Site name
- Materials/wastes accepted for landfill and recycling
- Materials/wastes banned
- Penalties

Signage within the site has been installed and is necessary to maintain to indicate areas of waste segregation. The Hamlet is planning to install an entrance sign to the solid waste facility.

3.6 Site Personnel

3.6.1 Duties and Responsibilities

Senior Administrative Officer (SAO)

The Hamlet SAO is responsible for the overall operation of the landfill facility. The daily operation and maintenance of the landfill is the responsibility of the Public Works Foreman. Two or three people are employed by the Hamlet to operate the garbage collection vehicle.

The SAO reports directly to the Mayor and is responsible for the following:

- Supervises - Site Foreman
- Maintains Liaisons with: Clients (Private sector generators & Government agencies), Suppliers, Inuvialuit Water Board

The Hamlet SAO Shall:

1. Ensure the operations are performed at the facility in accordance with the Landfill Operations & Maintenance Manual (latest approved version), applicable Engineering Drawings, the Operating Permit issued by the Inuvialuit Water Board;

2. Ensure that only acceptable wastes, as indicated on the approved list for disposal, are permitted at the site in consultation with regulatory agencies;
3. Prepare facility operating budgets and undertake staffing selections, and or contractors;
4. Communicate as required with regulatory agencies, including the forwarding of monitoring results, compiling annual reports;
5. Deal directly with the public, responding to disposal requests;
6. Coordinate site visits;
7. Maintain the environmental monitoring/sampling program;
8. Ensure that operators receive required training, when available;
9. Ensure that the site is maintained and operated in a clean and safe manner at all times, including regular collection of litter and compliance with NWT Safety Act and Regulations;
10. Coordinate the preparation of landfill areas for operation, and identifying the requirement for the establishment of surface water control measures.

Site Foreman

The Site Foreman reports to the SAO and is supervises Full-Time and Part-Time Assistants

The Site Foreman shall:

1. Perform operations and supervises operators at the facility in accordance with the Landfill Operations & Maintenance Manual (latest approved version), applicable Engineering Drawings, and the Water Licence issued by the Inuvialuit Water Board;
2. In consultation with the SAO, ensure that only acceptable wastes, as indicated on the approved list for disposal, are permitted at the site;
3. Prepare regularly scheduled reports (daily, weekly, monthly, annually) on progress and planning at the site;
4. Provide overall direction for daily site activities;
5. Conduct work in accordance with the Hamlet of Sachs Harbour Occupation Health and Safety Program and NWT Safety Act and Regulations;
6. Be responsible for the operations and maintenance of the site machinery;
7. Make recommendations to the Hamlet for major and minor repair work required for site equipment as well as replacement of same;
8. Ensure that the site is maintained and operated in a clean and safe manner at all times, including regular collection of litter;
9. Ensure that solid waste is compacted and covered in accordance with the Landfill Operations & Maintenance Manual;
10. Maintain accurate inventories of cover material for the ongoing maintenance of the solid waste site.
11. Ensure that approved burnable solid waste is segregated and burned in accordance with the ENR guidelines;
12. Coordinate snow removal and general maintenance for the access roads within the site and other areas as necessary;
13. Operate and maintain access to the segregation cells and control the surface water;
14. Undertake site security checks, reporting any noted issues to the Hamlet;
15. Inspect the site access road on a regular basis to recover any accumulation of garbage or other debris;

16. In consultation with the Hamlet, maintain the completed portions of the landfill;
17. Ensure that adequate signage and traffic control devices are in place in coordination with the Hamlet;
18. Perform all duties related to the identification and recording of incoming vehicles, and inspection of incoming waste;
19. Answer incoming telephone calls and requests for information, directing such requests as required; and
20. Perform such other related duties as may be assigned from time to time by the Hamlet.

Site Operator

The Site Operator is responsible for general site operation and maintenance requirements at the facility.

Site Assistants

The Site Assistants are responsible for tasks assigned to them by the Site Foreman. These positions would typically address both ongoing and periodic general site operation and maintenance requirements.

The Site Operator and Assistants report directly to the Site Foreman and are responsible for the following:

1. Perform duties as assigned by the Site Operator; and
2. Conduct work in accordance with the Hamlet of Sachs Harbour Occupation Health and Safety Program and NWT Safety Act and Regulations.

3.7 Personnel Training

The Hamlet is responsible for the training of staff. Solid Waste Facility staff should be trained to perform his or her job in a safe and environmentally responsible manner, in accordance with applicable regulations.

Given the nature of activities at the site, the SAO and Site Foreman will serve as the facility's health and safety representatives, and health and safety issues will be discussed as part of site meetings. All personnel should be familiar and abide by NWT Safety Act and Regulations.

A review of this Operations and Maintenance Manual will be a prerequisite for any employee/contractor before being declared eligible for work at the Landfill. Contractors and personnel are required to comply with all laws and regulations affecting the execution of the work at the site, including all applicable Federal, Territorial and local laws and regulations pertaining to socio-economic and environmental matters. All staff working at the Solid Waste Facility shall be trained in Bear/Wildlife Safety.

3.8 Site Security

Access to the landfill can be controlled at the landfill entrance. The chains are locked when the landfill is closed. The site is visited daily by the Hamlet staff for inspection.

4.0 Operational Procedures

The facility is managed using the area method. It is recommended that a 2 m high perimeter berm be constructed along the west edge of the site, to fill this area using the mounding method described below and to extend the life of the site.

4.1 The Area Method

This method has been used at the Sachs Harbour solid waste facility since the soil and terrain conditions are not suitable for excavation. A 1.5 m berm was constructed against which wastes are disposed and worked with heavy equipment such as a bulldozer, and packed. Soil is added as required to provide suitable cover. The area method procedure is illustrated in the **Figure 4** below.

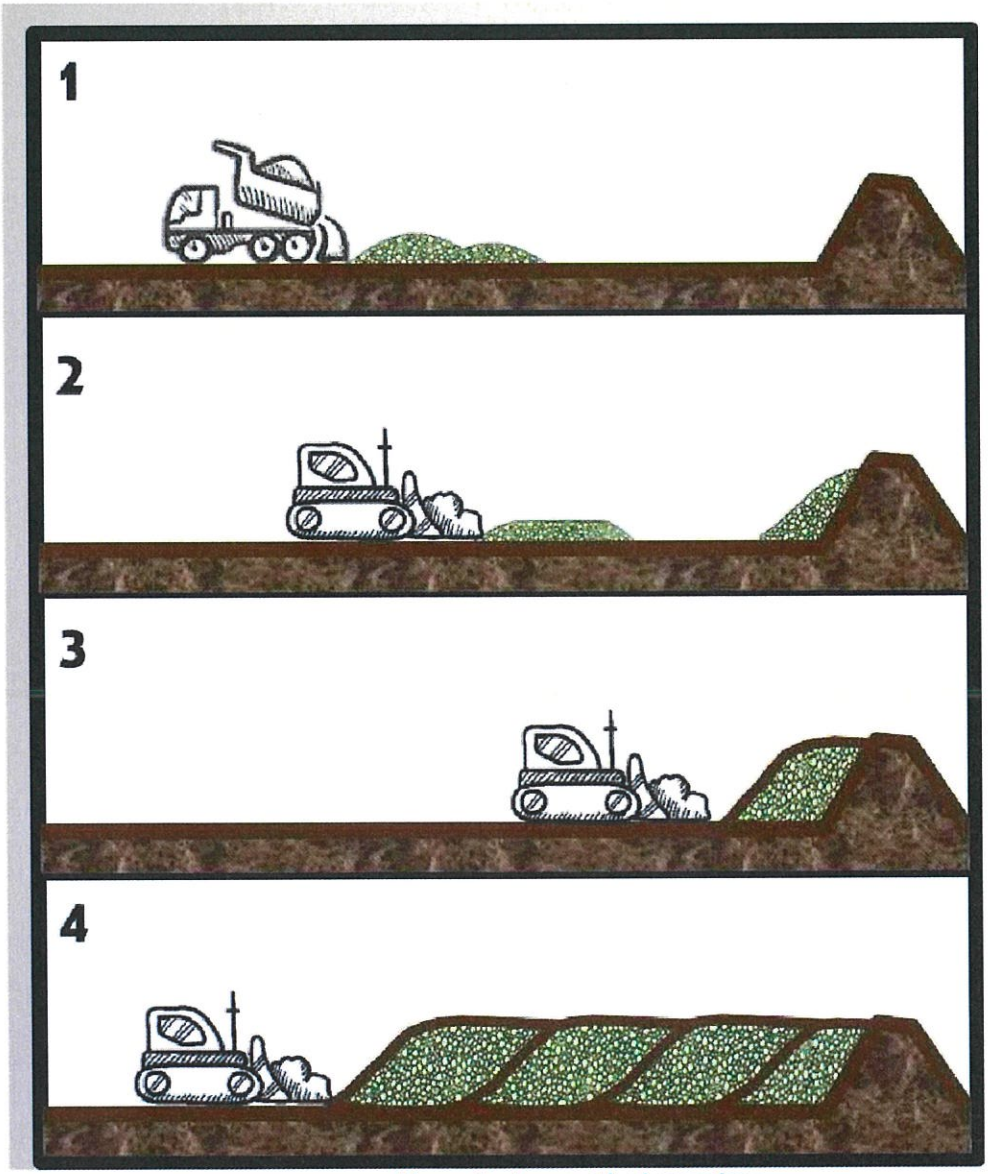


Figure 4: Area method procedure

1. Build berm, 2 m high. Dump waste near the berm.
2. Drive over the waste 3-5 times with a dozer. This will compact and compress lofty items and will help increase the capacity of the cell.
3. Alternate between dumping and packing waste until the packed waste is 2 m high (to the berm). In the spring or fall, or when the waste pile reaches 3-4 m wide, cover it with of 0.3 m of granular material to make a cell.
4. Repeat steps 2 and 3 to make more cells, until the site is full. Then cover all the waste with 0.3 m of granular material. Pack and add more granular material until the top is level.
5. Build a new 2 m berm on top of the cells.
6. Repeat steps 2-4.
7. To close out the site, put 0.6 m of granular material on the cells then pack the surface down with the bulldozer so that water runs off.

4.1.1 Mounding to Provide Additional Life

As with any of the recommended methods for the operation of a modified landfill in the Northwest Territories, additional life can be added to a site by mounding. Slopes should be maintained for safe operation of equipment, prevent erosion, and minimize costs for cover material. Geotextile fabrics will promote slope stability. The mounding method procedure is illustrated in the **Figure 5** below.

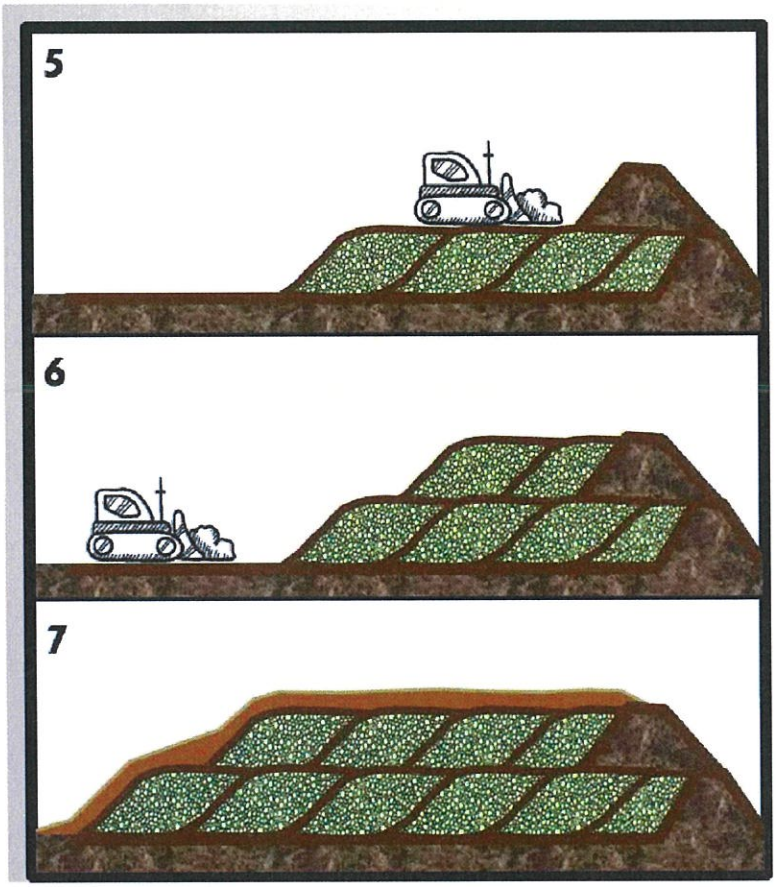


Figure 5: Mounding Method Procedure

4.2 Basic 'Area Method' Operations

The dozer is used once every week or "as needed" to push the waste into the disposal area. Readily available cover material is placed in layers using sand available on-site and stockpiled for use. The following procedures must be carried out on a regular basis to ensure the landfill operates safely and efficiently:

- All wastes are to be dumped in the appropriate area;
- Dumping should be restricted to a manageable portion of each area at a time;
- Weekly, or as frequentlys as possible, the wastes should be compacted using the Bulldozer;
- After compaction, each layer should be no more than 2.5m thick;
- The compacted waste should be covered with readily available cover material, from the borrow pit adjacent to the landfill, to a depth of 0.3 m for intermediate layers and 0.5m for the final cover; and
- Each layer of solid waste and cover material should be sloped to allow drainage. This can be done by adding more granular material to make a mound 0.3 high in the middle.

4.3 Bulky Waste Area Operation

The bulky waste disposal area is located north of the general disposal area. The landfill has an extensive scrap metal pile that has been accumulating since the 1980's. Large non-combustible items such as automobiles, snowmobiles, old furnaces, appliances, holding tanks, and tires are placed in the bulky waste disposal area. All fluids shall be drained from discarded automobiles and other motorized equipment prior to being accepted at the landfill to prevent site contamination.

White goods containing Ozone Depleting Substances (ODS) such as refrigerators and other deep freeze appliances shall be segregated from the regular bulky waste piles so that ODS's may be removed by a certified technician when a sufficient quantity have been accumulated.

Discarded electronic equipment such as computers and televisions shall also be segregated from the regular bulky waste piles so that environmental contaminants present in such devices such as lead and cadmium may eventually be recycled.

Runoff from this area is kept out of the swamp and confined to the main landfill area by the berm that has been built up around the perimeter.

To ensure effective operation:

- Place bulky wastes in an organized manner, starting from the back and working towards the front;
- Stack bulky wastes whenever possible to conserve space; and
- Ensure that wastes are stacked in such a way that it is safe to walk through the site.

Once the bulky and hazardous wastes currently stored on site have been removed, a processing and shipping plan should be developed for management of bulky waste at the site in subsequent years.

4.4 Special Considerations

4.4.1 Winter Operations

A compaction and covering cycle is to be completed in the fall to prepare for the onset of winter. If required, a new berm should be built prior to the onset of winter to provide adequate capacity until the following summer. Area fill and mounding operations easily performed in the winter as the frozen slopes are more stable.

4.4.2 Wind

The landfill site is located in the open tundra; hence, litter fences are required to help control the movement of wind driven material off the landfill site. The solid waste operator is responsible for collecting the windblown litter throughout the year.

4.4.3 Spring Clean-up

A spring clean-up should be conducted after the snow has melted to collect waste that has accumulated around the site and around the Hamlet over the winter.

4.5 Safety

Due to the nature of the facility, safety precautions should be taken by those personnel involved in the operation and maintenance of the landfill.

Some of the safety precautions which landfill personnel should follow include:

- Water and puncture proof gloves and safety boots are to be worn at all times;
- Work clothes should not be worn home;
- Hands are to be washed frequently, as a minimum after work and before eating;
- During approved waste burning, personnel should stand clear to reduce exposure to toxic fumes and smoke; Burning wastes should not be left unsupervised;
- Personnel should receive appropriate vaccinations and ensure they are kept up to date;
- Proper lifting techniques should be exercised, lift with your legs and not your back; and
- Only personnel trained to handle hazardous materials should do so.
- Bear encounters can be frequent at the landfill. Site personnel should be familiar with bear safety protocols and bear bangers or other deterrents should always be carried while on site.
- If a bear is encountered at the solid waste facility, it is recommended that all work on site be halted while the bear is present. If work must proceed, extreme caution should be used while working around the animal. Please see **Appendix B** for bear safety information.
- Frequent compaction of waste will help to remove the attraction for bears; these activities should take place a minimum of once a month.

All personnel should be familiar and abide by the Hamlet of Sachs Harbour's Occupation Health and Safety Program or the NWT Safety Act and Regulations which contain information such as training requirements, personal protective equipment requirements, WHMIS & Transportation of Dangerous Goods, Chemical Storage & Fire Protection, and First Aid.

All personnel should be familiar with and abide by the NWT Safety Act and Regulations.

The Hamlet is responsible to ensure that workers are supplied with the proper equipment and materials to conduct work safely, and to ensure that workers are trained in and follow established safe work procedures.

It is the duty of every worker to assume responsibility for their own safety by complying with legislative, company and industrial standards as well as the prompt reporting of all unsafe acts or conditions to supervisors to ensure immediate action and resolution.

4.5.1 Managing Contaminated Soils and Snow

Contaminated soils are generally not accepted at the Solid Waste facility. However, deposits can be managed with approval from the ENR. Deposits of contaminated soil and/or snow shall be contained in such a manner as to minimize the potential for migration of contaminants into any waters, to the satisfaction of the Inspection. This could involve the installation of berms or liners at the receiving site.

4.5.2 Managing Hazardous Wastes

Hazardous Waste Definition

Hazardous wastes require special handling and disposal techniques to eliminate the risks to human health and the environment. *Hazardous waste* is defined in the Guideline for Hazardous Waste Management.

Residents need require relatively small secure containment for typical household hazardous waste that includes:

- Cleaning Products (oven cleaners, drain cleaners, bleach, spot remover)
- Paints and Solvents (oil-based paints, thinners, paint stripper)
- Automotive Products (antifreeze, motor oil car batteries, brake fluid, transmission fluid)
- Small propane tanks & cylinders (Barbeque tanks)
- Miscellaneous Hazardous Materials (household batteries, thermostats, pharmaceuticals, aerosol sprays)

Household hazardous waste from residents will be collected at the Hamlet Garage and stored in secure means of containment such as pails, drums, pallets, and mega bags.

All hazardous waste generated by Industrial, commercial and institutional sector are to be managed by the waste generator in accordance with the Guideline for Hazardous Waste Management.

Due to the danger of handling hazardous wastes, the handling, packaging, storage, treatment of the waste should only be completed by personnel trained in Transportation of Dangerous Goods (TDGR) and/or Hazardous Waste Management and WHMIS. Transporting hazardous waste on barges requires specific International Marine Dangerous Goods (IMDG) Certification.

Containers and storage areas must be properly labelled and signed during the entire time of storage. If this is not carefully completed then there could be problems identifying the waste when it is time to ship it for disposal.

4.6 Site Records

Records should be kept to assist in planning for yearly operations and future expansion. The information should be reviewed yearly to evaluate the effectiveness of the operation and to forecast future operational requirements. The records should be kept in the Hamlet Office and maintained by the SAO.

As a minimum, the following information should be recorded:

Domestic Waste

- The number of collection trips and loads per day;
- The dates of compaction and cover; and
- The dates of burning approved

Construction and Demolition Waste

- The number of collection trips and loads per day;
- The dates of compaction and cover; and
- The dates of burning approved wastes.

Bulky Wastes

- Itemize the site contents;
- The number of trips to the site and the dates; and
- The date when the site is full.

The Hamlet shall also maintain the following information at the Hamlet Office:

- Copy of the permit(s) for the site or the certificate(s) of operation;
- Inspection records for inspections conducted by staff and regulatory agencies;
- Monitoring results for leachate, surface and ground water;
- Interpretations of monitoring results; and
- Copies of all annual reports.

The SAO shall, unless otherwise instructed by an inspector, include all of the data and information required by the "Surveillance Network Program" in the Hamlet's Annual Report. This includes the results of the approved quality assurance/quality control program which shall be submitted to the Inuvialuit Water Board on or before April 30th of the year following the calendar year being reported. The Surveillance Network Program is outlined in a separate Surveillance Network Program Manual.

5.0 Maintenance Procedures

Proper maintenance of a landfill is crucial to ensuring the efficient operation of all the components. Activities can be divided into two categories: storage/collection maintenance and site maintenance.

5.1 Storage and Collection Maintenance

Residential waste collection is conducted twice a week on Tuesdays and Thursdays. The Hamlet conducts a periodic visual inspection of the site, and general site maintenance is performed by the Foreman and Site Assistants.

5.1.1 Storage Maintenance

As the first step in the waste collection process, residential and commercial storage containers should be adequately maintained. The following points should be considered:

- Private burning of wastes within the Hamlet boundaries is not permitted as the smoke and fire hazards generally outweigh any benefit from reducing the volume of waste;
- Garbage containers should be covered to prevent wind-blown debris from littering the community and to prevent animals from getting into the garbage; and
- Bulky wastes should not be left in residential areas for long periods due to aesthetic and safety concerns.

5.1.2 Collection Maintenance

The waste collection vehicle should be maintained in good operating condition to ensure the collection service is not interrupted for extended periods. Other maintenance considerations include the following:

- The collection vehicle should be equipped with a shovel to clean up accidental spills during collection; and
- The collection vehicle should be cleaned periodically.

5.1.3 Equipment Maintenance

Regular vehicle maintenance is to be performed on all Hamlet-owned equipment. This should include but is not limited to regular:

- Oil changes
- Fluid changes
- Checking of tire pressure
- Greasing
- Brake pad replacement
- Cleaning
- Periodic maintenance requirements as set out by the equipment manufacturer

In the event of equipment failure or malfunction, it shall be the contractor's responsibility to correct the problem using appropriate methods.

5.1.4 Fencing

A 1.8m high fence is located along a portion of the perimeter of the landfill. A gate is in place across the main access road to control access. A temporary snow fence is used around the solid waste bermed area to help control wind-blown litter.

5.1.5 Access Road Maintenance

The access road is gravel and approximately 150 m long. Basic road maintenance is to be conducted as follows:

- At least twice per year, the road is to be graded to smooth and reshape the surface; and
- During the winter, snow is to be removed to ensure unrestricted access to the site for the garbage collection vehicles.

5.2 Nuisance Control

5.2.1 Litter Control

Litter can be a significant problem at municipal solid waste disposal sites. Litter control is best accomplished by a combination of proper disposal operations, litter retaining fences, and a litter picking program. A clean, litter-free appearance will be maintained at the site at all times, not only for public relations, but also for efficient operation of the landfill. Poor litter control attracts unwanted scavengers.

In summary, litter control measures shall include:

- Regular weekly and monthly covering of wastes in the active disposal area;
- Litter collection fencing located around the active fill area to catch blowing litter;
- A litter collection schedule shall be directed by the Site Operator; and
- Litter on fencing, on site roadways, in ditches and adjacent properties shall be monitored and collected on a minimum monthly basis.

5.2.2 Odour Control

Odours will be controlled at the facility by implementation of the following daily measures:

- Regular soil cover shall be applied at the active disposal area;
- Burning of approved wastes shall only be conducted with prior approval from inspectors and at times when weather conditions permit; and
- Routine site inspections to identify and eliminate localized surface water ponding and/or surface water drainage problems.

5.2.3 Wildlife Control

Solid waste disposal facilities attract birds and other wildlife due to the availability of food. This landfill facility is near the airport buffer zone and therefore bird control is very important. Control measures to minimize the presence of birds shall include:

- Compacting and covering of waste;
- Collecting litter; and
- If this does not seem to minimize the amount of birds in the area then a noise device such as propane cannons and screechers may be required to discourage birds from the site.

5.3 Indiscriminate Dumping

Waste will be disposed at designated areas at the facility (i.e. bulky waste, treated lumber, tires, contaminated soil etc.) only. When indiscriminately dumped materials are discovered, they will be immediately relocated to the appropriate designated area. This includes any hazardous materials that are found to have entered the general waste stream. If hazardous wastes are found to have entered the facility, the owner of these materials will be contacted to remove them if possible. If this is not possible, hazardous materials found in the general waste stream will be immediately relocated to a temporary storage area until they can be processed and removed from the site to a proper Hazardous Waste Receiver.

Although the Hamlet of Sachs Harbour does not accept hazardous wastes from industrial sources, it will remove hazardous materials that are indiscriminately dumped in the landfill. This will be done in accordance with Territorial guidelines that require site record be provided including the name of the carrier removing wastes and copies of the Transport of Dangerous Goods forms from persons removing wastes from the site.

5.4 Spill Prevention and Control

Spill prevention planning and control should be used to:

- Prevent the occurrence of spills of petroleum products and other regulated liquids (liquids) by the use of sound maintenance and management controls where spills occur.
- Prevent the unauthorized discharge of liquids into surface waters, the sewers system and to prevent contamination of the environment by those liquids.
- Prevent exposure of personnel, the public, and the community to liquids.

Petroleum Products and Other Reportable Liquids

No petroleum products and other reportable liquids are stored at the facility. Petroleum products are used to fuel vehicles using the facility.

5.4.1 Reportable Releases or Incidents

Spills can be defined as releases of pollutants into the natural environment originating from a structure, vehicle, or other container, and that are abnormal in light of all circumstances. Spills must be reported immediately to the NWT 24-hour Spill Line (867) 920-8130, and by filling out and submitted a Spill Report Form by Fax (867) 873 6924 or by email at spills@gov.nt.ca. A sample Spill Report Form can be found in **Appendix C.** Where the owner and/or the person in control of the spilled material are not already aware of the spill, the incident must also be reported to them.

The size of a reportable spill varies depending on the type and consequence of the spill and must be reported if the release is regarded as abnormal. Dripping and leaks such as would normally be associated with vehicle maintenance and operation are not defined as reportable spills. Minimum reportable quantities by type of contaminant are listed in the "Consolidation of Spill Contingency Planning and Reporting Regulations". Although this legislation prescribes quantities under which spills

are not reportable, accurate determination of spill quantities is difficult and often underestimated. (**Appendix D** identifies reportable quantities for all types of dangerous goods.)

5.4.2 Spill Containment Equipment

Site Equipment

A supply of shovels, and sorbents shall be readily available at the Solid Waste Facility. In addition, shovels, rubber gloves, rubber boots, sorbent pads and a boom shall be maintained at the Hamlet Public Works Shop and made available to the Solid Waste Facility as needed.

Collection Vehicles

Each collection vehicle shall be supplied with an emergency spill containment kit, which contains a drip pan, absorbent material such as cat litter bags and small absorbent booms designed to prevent liquids from entering drains.

5.4.3 Potential Areas Where Spills Could Occur

Potential spills could occur at locations where liquids are stored or used, such as at tanks and during vehicle fuelling. This section of the plan details the procedures used to ensure that every precaution is taken to minimize the potential for a spill.

Incoming Waste Screening

Incoming waste should be screened for non-accepted waste items as described in Section 3.2.2 of the O&M Manual.

Vehicle/Equipment Fuelling

The following procedure is used to ensure the risk of spills while fuelling is minimized:

- Engine shall be shut off.
- Drip pans or other similar preventative equipment shall be used.
- The person fuelling the vehicle will not leave the fuelling station unattended.
- Automatic fuel shut-offs will not be used.

If a spill should occur, the Hamlet Foreman will be informed immediately and will coordinate the spill response as noted below.

5.4.4 Emergency Spills Response

The following procedures represent the approach that staff will take when responding to a spill of a liquid or petroleum product. Prompt response to a spill is the best means of minimizing any impact to the environment and in particular, preventing a discharge reaching surface water.

Immediate Notification and Response Procedure

In the event of a spill, the employee first becoming aware of the spill will assume the role of temporary spill coordinator until he/she can notify the Hamlet Foreman. If the temporary spill coordinator is unable to notify either the Hamlet Foreman or a back-up, then he/she will assume the responsibility of

implementing the response procedures to ensure public and environmental safety is preserved until back-up arrives. The following immediate response and notification procedure will be followed:

Spills Occurring at the Solid Waste Facility:

The employee will:

- Disconnect or shut off any mechanical equipment connected with or causing the spill that can be done without jeopardizing his or her personal safety.
- Temporarily secure area to minimize environmental impact by, for example, plugging drains to prevent uncontrolled liquid discharge into surface water.
- Contact the Hamlet Foreman for further instructions.

Spills Occurring on Public or Private Property:

The employee will:

- Disconnect or shut off any equipment connected with or causing the spill that can be done without compromising his or her safety.
- Marshal any public or individuals away from the spill area.
- Temporarily secure area to minimize environmental impact by covering drains to prevent uncontrolled liquid discharge into sewers or into surface water.
- Contact the Hamlet Foreman for further instructions.

Assessment of Hazard

Upon notification of a spill, the Hamlet Foreman will determine the hazard potential of a spill response by determining at least the following factors:

- Details regarding the spill location and any public or environmental impact.
- The substance spilled and its hazard potential.
- The amount of the spill and the extent of spreading.
- The source of the leakage/spill.
- The action taken to minimize impact.

If a spill is determined to be of such a magnitude that it cannot be safely and effectively controlled by facility personnel, then the Hamlet Foreman shall promptly notify outside emergency response companies to implement control and cleanup.

Reporting of Spill

The GNWT 24-hour spill line number is (867) 920-8130. See Section 7.2 in O&M Manual for reporting procedures.

Directing Spill Response

The Hamlet Foreman shall direct those responding to the spill to obtain the appropriate response equipment and personal protective equipment. The Hamlet Foreman will liaise with any Territorial Environment Officer present on the scene.

5.5 Burn Box Maintenance

A burn box is located at the landfill for approved wastes including paper, cardboard, and untreated lumber. These materials can be diverted from the landfill and are burnt to reduce waste volume. Burning of wastes must be approved by ENR. The following practices should be adhered to when burning:

- Reuse or recycle wood residues if feasible;
- Only burn when conditions permit and keep fire under control at all times;
- Measures are taken to ensure the fires do not escape the burn box to prevent the spread of fire to the rest of the landfill;
- Adequate fire-fighting equipment is readily available ;
- Brush and wood is stacked in a series of separate piles to facilitate fire control and to enhance a hot burn for the minimization of smoke;
- conditions are blowing away from the community so that there is no threat to public health and safety and no nuisance or hazard is caused by smoke or odour;
- The duration of any burning is less than 24 hours; and
- Full time supervision is provided until the burning activity is complete (i.e. until there is no smoke and until no danger of fire exists). **Open fires should not be left unattended.**

6.0 Monitoring

6.1 Surface Water Monitoring

A SNP manual has been developed that includes procedures for sampling surface water as per the terms and conditions of the water licence.

6.2 Runoff and Drainage Control

The objective of runoff control is to control the discharge of water from the site to the receiving environment. The water leaving the site will be comprised of melt water from the spring freshet, runoff from precipitation, and leachate from the waste mass.

7.0 Emergency Response

Due to the nature of the facility, uncontrolled fires and spills of unknown materials should be treated with extreme caution. Hamlet personnel responsible for solid waste facilities should be trained in Workplace Hazardous Materials Information System (WHIMS), Transportation of Dangerous Goods (TDG), Emergency First Aid, and Bear Safety. It is also important to ensure that appropriate vaccinations are kept current.

7.1 Fire

A contingency plan shall be developed by the Hamlet Fire Department for responding to a fire at the solid waste disposal site. Special precautions should be implemented as burning refuse can produce poisonous emissions. The following procedures should be used in case of an uncontrolled fire:

- Evacuate the area around the landfill immediately
- Keep all personnel up-wind of site
- Notify the Hamlet Fire Department

7.2 Spills

Spills of unknown substances at the landfill should be treated with extreme caution. Spilled materials should only be handled by properly trained and equipped personnel. The following actions should be undertaken by personnel in the event of a hazardous materials spill at the landfill:

- Be alert and consider your personal safety first;
- Assess the hazard to persons in the vicinity of the spill and where possible take action to control danger to human life. If possible, identify the material or products spilled;
- If the spill creates a fire, explosion or other hazard to human life, remove all potential ignition sources, if possible evacuate the area and contact the RCMP, and the Fire Department; and
- If safe and practical, try to take appropriate action to stop the release material:
    - Contact the Hamlet Foreman and report the spill; and
    - Mark the spill scene to warn public and prevent access.

Once contacted, the Hamlet Foreman shall:

- Proceed to the spill location;
- Make necessary arrangements for first aid and removal of injured personnel;
- Take necessary action, where possible, to secure the site to protect human safety;
- If not already done so and if it is safe to do so, take the appropriate action to stop the flow or release of material. If at all possible take the necessary action to contain or prevent the spread of spilled material;

- Contact the 24-hour spill line at (867) 920-8130;
- Contact the Hamlet SAO; and
- Contact the Fire Department if required.

Environment Canada's Emergency Contact number is (867) 920-5131. This number connects to a 24-hour emergency pager that is monitored by Emergency and Enforcement Officers.

Throughout the spill response, personnel should place their personal safety as the highest priority.

7.3 Bear Safety

There are active polar bears around Sachs Harbour at any given time. No mitigation measures are in place to deter wildlife from entering the area. There are currently no bear deterrents used at the site. No provision has been made to erect electric fences on site due to cost. For this reason, it is imperative that all personnel working in and around the solid waste site be properly trained in bear safety. A copy of the Bear Safety Manual provided by the Government of the Northwest Territories is included in **Appendix B**.

8.0 Operations and Maintenance Summary

Daily

- Collect waste from the Hamlet and transport to the landfill
- Ensure all wastes are disposed of and are contained in designated areas
- Push garbage with loader into a contained area
- Clean up any spills immediately
- Clear snow from roads and disposal areas as required
- Record O & M information

Weekly

- Pick up windblown materials which have migrated past the boundaries of the landfill
- Record O & M information
- Compact and cover refuse if necessary

Monthly

- With ENR approval, burn paper and wood material as required
- Grade and maintain access roads if required
- Record O & M information
- Prepare materials for backhaul on the barge

Yearly

- Compact and cover refuse in the spring and fall
- Review O & M records to assist in planning for the upcoming year
- Prepare new landfill area (or berm for mounding) if required during the summer months
- Prepare materials for backhaul on the barge

9.0 References

Environment and Climate Change Canada. Solid Waste Management for Northern and Remote Communities, Planning and Technical Guidance Document: March 2017

Heinke, G.W. and Wong, J., 1990, Guidelines for the Planning, Design, Operation and Maintenance of Solid Waste Modified Landfill Sites in the Northwest Territories, Volume I - Planning and Design, Volume II - Operation and Maintenance Produced for MACA.

Kent, R., Marshal P.,Hawke L. 2003, Guidelines for the Planning, Design Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories. Produced for MACA.

NWT Bureau of Statistics. *2016 Population Estimates by Community.* Yellownife, NT : Government of the Northwest Territories, 2016.

Appendix A

Municipal Solid Wastes Suitable for Open Burning

Municipal Solid Wastes Suitable for Open Burning

Municipal solid wastes (MSW) that are conditionally suitable for open burning are paper products, paperboard packaging and untreated wood wastes only.

Conditions for this burning are:

* The principle of source reduction should be utilized to reduce, reuse and recycle materials otherwise bound for landfill.

* The appropriate materials are segregated and burned in a controlled manner and site which is separate from the working landfill so that the fire cannot spread. Standard burning conditions shall apply to burning such as on days where winds are light, blowing away from the community, in manageable volumes so that fires do not get out of control, having applicable permits and managed by an authorized, qualified person from the community. These are conditions also recommended in the Municipal and Community Affairs Solid Waste Modified Landfill Guidelines.

* Building demolition wastes should not be burned unless they have been sorted to remove non-wood wastes such as roofing materials, electrical wire, plastics, asbestos and other non-wood wastes.

* Waste wood treated with preservatives such as creosote, pentachlorophenol or heavy metal solutions shall not be burned. Examples of treated wood materials include railroad ties, telephone/hydro poles, pilings, cribbing and foundations.

* Following a review of the specific landfill location, additional local conditions or controls may be applied.

Where geographic conditions do not allow for the proper operation of a modified landfill, such as because of limited availability of cover materials and unsuitable ground conditions, communities may have to assess other alternatives of MSW management ie: balefill, incineration.

The open burning of non-segregated MSW remains an unacceptable option for the management of MSW. Continuation of this practise should not be allowed unless a site- specific assessment fails to identify a feasible and practical alternative. At that point some form of segregation will be required.

Environmental Protection Division
Department of Environment and Natural
Resources Phone:

Appendix B

Polar Bear Safety

Each encounter with a polar bear is unique. Good judgement, common sense and familiarity with polar bear behaviour are required in all situations. This pamphlet provides guidelines for avoiding and dealing with polar bear encounters. For your safety and the safety of the bears, please read this pamphlet carefully and seriously consider the risks involved with travel in polar bear country. Further information is available in the DVD *"Polar Bears: A Guide to Safety"* developed by Parks Canada and the Safety in Bear Country Society.

After a *polar bear attack* or *encounter* follow this emergency check list:

1. **STAY CALM** and ensure you are safe.
2. Check that all people in your group are accounted for.
3. Call for help by radio or satellite phone. (Get contact numbers at your orientation to the park.)
4. Report location and time of incident.
5. Report number of people involved.
6. Report extent of injuries and property damage.
7. Report numbers and last locations of all polar bears involved in the incident.
8. Report reason for the attack if known (female protecting cubs, surprise, defending food source, etc.)
9. Report description of bears (male or female, size, markings, etc.)
10. Stand by to provide additional information to rescuers.

Polar bear behaviour is very different from that of grizzly and black bears.

Polar bears are predators, primarily hunting seals, while grizzlies and black bears mostly eat plants. As predators, polar bears will investigate humans, their camps and may even consider humans as a food source.

AVOIDING an ENCOUNTER

Be alert and aware of your surroundings. Scan all around with binoculars at regular intervals. Be vigilant! Watch for signs such as tracks, droppings, diggings, wildlife carcasses and polar bear dens.

Travel in daylight and avoid areas of restricted visibility. Be especially careful in areas along the coast, where a polar bear may be hidden behind boulders, pressure ridges (pushed up sea ice), driftwood or vegetation.

Travel in groups and stay together to increase your safety. The larger the group the greater the chances of deterring a bear.

Never approach a bear for any reason. Every bear defends a "critical space", which varies with each bear and each situation: it may be a few metres or a hundred metres. Intrusion within this space is considered a threat and may provoke an attack. Approaching a bear could be considered disturbing wildlife which is an offence under the National Parks Wildlife Regulations.

Never approach a fresh kill or carcass as polar bears will defend their food. Adult polar bears will often only eat the fat of beached whales, seals and other kills, but other bears may scavenge from these carcasses.

Never feed bears. A bear that finds food from a human source begins to associate humans with food. This can result in the bear losing its natural tendency to avoid people and becoming persistent in its search for human food. The consequences for you and the bear can be serious. A bear that associates food with humans is more likely to injure people and these bears may have to be relocated or killed. It is also illegal to feed any wildlife in a national nark.

Use sealed bags and containers or bear-proof canisters to store food and garbage. Pack out all garbage.

Eliminate or reduce odours from yourself and your camp. Avoid using scented soaps and cosmetics and avoid bringing strong smelling foods.

-
-

Polar Bear Feeding Areas

- **In fall, winter and early spring** most polar bears are on the sea ice hunting seals, by the floe edge, open water leads and along pressure ridges. Bears and seals can also be found in places where the ice is thin or cracked, such as tide cracks in land-fast ice or at toes of glaciers. Seals can more easily maintain breathing holes in these areas.
-
- **In early spring,** females with cubs tend to hunt along pressure ridges and cracks in land-fast ice (particularly in bays) where seal birthing dens are found.
-
- **During the ice-free summer season,** when polar bears are forced ashore, they can be found anywhere but they generally hunt and scavenge along coastlines, beaches and rocky islands. Keep an eye on the ocean, polar bears are often well hidden when swimming.

Stay away from polar bear den sites.

Unlike other bears, there is no time when all polar bears are inactive in dens.

- **Maternity dens** are excavated by pregnant females in snow drifts on leeward (wind protected) slopes of coastal hills and valleys. In the Baffin Region, dens can be found at high elevations on snowfields and glaciers. Maternity dens are occupied from fall to early spring. The dens are inconspicuous, however, bear tracks leading to and from the site in early autumn or late spring or ventilation holes can indicate their presence.
- **Temporary dens** are excavated in snow drifts or pressure ridges by polar bears (males, females and females with cubs) that are active over the winter. The dens can be used as resting places or as temporary shelter from bad weather. They can be used from a few days to several months.
- **Summer retreat dens** are excavated during the open water season in the remaining snow banks or into the permafrost. These can also be at higher elevations on snowfields and glaciers or the valleys leading up to them. Male and female bears of all age groups use them to keep cool and avoid insect harassment.

If a bear does not know you are there:

- **quietly back away and leave the area** either in the direction you came or make a wide detour around the bear. Do not run, move quickly or make motions that might attract the bear's attention.
- **stay downwind,** so the bear cannot smell you and detect your presence.
- **keep an eye on the bear.**

If a bear knows you are there and shows signs of being curious, such as:

- moving slowly with frequent stops,
- standing on hind legs and sniffing the air,
- holding its head high with ears forward or to the side,
- moving its head from side to side, or
- trying to catch your scent by circling downwind and approaching from behind.

THEN:

- **help it to identify you as a human,**
- **wave your arms over your head and talk in low tones,**
- **move slowly upwind** of the bear so it can get your scent.

If the bear has been surprised at close range or shows signs of being agitated or threatened, such as:

- huffing, panting, hissing, growling or jaw-snapping,

- stamping its feet,
- staring directly at a person, or
- lowering its head with ears laid back.

THEN:

- **act non-threatening.** Do not shout or make sudden movements, which might provoke the bear. Never huff or hiss as this can cause a polar bear to charge.
- **avoid direct eye contact.**
- **back away slowly.** DO NOT RUN.
- **be prepared to use deterrents.**

If the bear shows signs of stalking or hunting you, such as:

- following you or circling you,
- approaching directly, intently and unafraid,
- returning after being scared away, or
- appears wounded, old or thin.

THEN:

- **fight back!** Use any potential weapon, group together and make loud noises.
- **DO NOT RUN.**
- **be prepared to use deterrents.**

If a bear charges:

- **stand your ground and be prepared to fight!** Focus on hitting the bear in sensitive areas, especially the face and nose if possible. Bluff charges are rare.

Report all bear sightings and signs to ENR.

DETERRENTS

Reducing the threat posed by a polar bear during an interaction may be difficult. Non-lethal deterrents cannot be depended on to ensure safety. The best way to live safely with bears

is to avoid contact with them.

Any potential weapon must be considered, such as skis, poles, rocks, blocks of ice or even knives.

Stay together as a group. This can be a deterrent and actions, such as making noise, jumping, waving arms, throwing things, may help to drive a polar bear away.

COMMERCIAL deterrents

- **Noisemakers** including air horns, pistol and pen launched bear bangers may scare a bear away.
- **Pepper spray** is effective against polar bears, but has some limitations. It must be warm enough to atomize and it must be used at close range. Also be aware of wind direction to avoid having the spray blow into your face.
- **Know how and when to use these deterrents and practice beforehand.**
- **Availability of commercial deterrents is limited in the north,** most will have to be purchased elsewhere and transported as dangerous goods.
- **Portable solar electric fences** may deter a bear at your campsite if properly installed and maintained.
- Contact Parks Canada or ENR for more information.

Appendix C

Sample Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
Tel: (867) 920-8130 • Fax: (867) 873-6924 • Email: spills@gov.nt.ca

REPORT LINE USE ONLY

A	Report Date: MM / DD / YY	Report Time:	☐ Original Spill Report OR ☐ Update # _____ to the Original Spill Report	**Report Number:**
B	Occurrence Date: MM / DD / YY	Occurrence Time:		
C	Land Use Permit Number (if applicable):		Water Licence Number (if applicable):	
D	Geographic Place Name or Distance and Direction from the Named Location:		Region: ☐ NT ☐ Nunavut ☐ Adjacent Jurisdiction or Ocean	
E	Latitude: _____ Degrees _____ Minutes _____ Seconds		Longitude: _____ Degrees _____ Minutes _____ Seconds	
F	Responsible Party or Vessel Name:	Responsible Party Address or Office Location:		
G	Any Contractor Involved:	Contractor Address or Office Location:		
H	Product Spilled: ☐ Potential Spill	Quantity in Litres, Kilograms or Cubic Metres:	U.N. Number:	
I	Spill Source:	Spill Cause:	Area of Contamination in Square Metres:	
J	Factors Affecting Spill or Recovery:	Describe Any Assistance Required:	Hazards to Persons, Property or Environment:	
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials:			

L	Reported to Spill Line by:	Position:	Employer:	Location Calling From:	Telephone:
M	Any Alternate Contact:	Position:	Employer:	Alternate Contact Location:	Alternate Telephone:

REPORT LINE USE ONLY

N	Received at Spill Line by:	Position:	Employer:	Location Called:	Report Line Number:

Lead Agency: ☐ EC ☐ CCG/TCMSS ☐ GNWT ☐ GN ☐ ILA ☐ AANDC ☐ NEB ☐ Other: _____

Significance: ☐ Minor ☐ Major ☐ Unknown

File Status: ☐ Open ☐ Closed

Agency:	Contact Name:	Contact Time:	Remarks:
Lead Agency:			
First Support Agency:			
Second Support Agency:			
Third Support Agency:			

Appendix D

Reportable Quantities for Spills in the NWT

Substance	Reportable Quantity	TDG Class
Explosives	Any amount	1.0
Compressed gas (toxic/corrosive)		2.3/2.4
Infectious substances		6.2
Sewage and Wastewater (unless otherwise authorized)		6.2
Radioactive materials		7
Unknown substance		None
Compressed gas (Flammable)	Any amount of gas from containers with a capacity greater than 100L	2.1
Compressed gas (Non-corrosive, non-flammable)		2.2
Flammable liquid	≥100 L	3.1/3.2/3.3
Flammable solid	≥ 25 kg	4.1
Substances liable to spontaneous combustion		4.2
Water reactant substances		4.3
Oxidizing substances	≥ 50 L or 50 kg	5.1
Organic peroxides	≥1 L or 1 kg	5.2
Environmentally hazardous substances intended for disposal		9
Toxic substances	≥ 5 L or 5 kg	6.1
Corrosive substances		8
Miscellaneous products, substances or organisms		9
PCB mixtures of 5 or more ppm	≥ 0.5 L or 0.5 kg	9.0
Other contaminants--for example, crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, wastewater.	≥ 100 L or 100 kg	None
Sour natural gas (i.e., contains H_2S)	Uncontrolled release or sustained flow of 10 minutes or more	None
Sweet natural gas		
Flammable liquid	≥ 20 L	3.1/3.2/3.3
Vehicle fluid	When released on a frozen water body that is being used as a working surface	None
Reported releases or potential releases of any size that: 1. are near or in an open water body; 2. are near or in a designated sensitive environment or habitat; 3. Pose an imminent threat to human health or safety; or 4. Pose an imminent threat to a listed species at risk or its critical habitat	Any amount	None

INCORPORATED HAMLET OF SACHS HARBOUR
93 AJGALIAQ ROAD BOX 90, SACHS HARBOUR NT X0E 0Z0
Telephone: 867-690-4351
Facsimile: 867-690-4802

January 26, 2021

Resubmission

Mardy Semmler
Inuvialuit Water Board
Inuvik, NT

Re: N7L3-1531 Water License Operations & Maintenance Plans

Dear Mardy,

I am writing in response to your letter dated October 30, 2020 to complete the Report.

1. Location of Landfill site coordinates – 71' 58' N and 125'14' W - see attached map
2. All correct, see Solid waste plan
3. Hamlet ordered a Map from Yellowknife for the Landfill site
4. Water samples is taken from the natural runoff from 200 feet from the solid waste site
5. Landfill time built in the late 1990's
6. The hours of garbage day picks up are: Tuesdays and Thursdays from 9 – 5pm
7. Hamlet can apply for more land and or ship out hazardous materials and or metals by barge
8. Waste composition – see attached table
9. Map indicating the location of Surveillance Network Program sampling Stations coordinates. – see attached

Page 2 on Sewage Waste Disposal Facilities – IWB already has the Plan.

If you require further information, please contact our office at 867-690-4351.

Regards,

Betty Haogak,
Senior Administrative Officer

Betty Haogak

From: Gerald Enns <Gerald_Enns@gov.nt.ca>
Sent: Thursday, January 21, 2021 9:52 AM
To: Betty Haogak
Subject: RE: question 8

Hi Betty, No problem I am happy to clarify.

The Water Board asks the following:

8. Waste Composition: if site specific data for Sachs Harbour is not available, use data from Page 9, Section 2.2.3, Table 2.1 of the "Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the NWT (MACA, 2003)"; and

I referenced the typical percentage of waste amounts in that guideline which is included in the table below to estimate the amounts of each waste type for Sachs Harbour in Green.

NOTES:

1. Waste volumes are based on population and an averagesolid waste volume of 0.017m^3/c/day.
2. Weight estimates for uncompacted waste are based on a density of 0.099 tonnes/m^3
3. Volumes are for uncompacted solid waste including residential, commercial and industrial wastes.
4. Compacted volumes are based on a compaction rate of 3:1 (Heinke and Wong, 1990).

The composition of solid waste generated in Sachs Harbour on an annual basis is estimated in below.

Table 3: Estimated Composition and Amounts of Solid Waste Generated Annually in Sachs Harbou

Type of Waste	NWT Typical Waste Composition (% by weight)	Estimated Annual Tonnes
Food Wastes	20.3	13
Cardboard	9.8	6
Paper Products	17.2	11
Cans	4.4	3
Other Metal	6.2	4
Plasitc, Rubber, Leather	14	9
Glass, Ceramics	5.7	4
Textiles	3.8	2
Wood	9.9	6
Diapers	3.8	2
Dirt	4.9	3
Total	**100**	**63**

N7L3-1531 - Hamlet of Sachs Harbour, Solid Waste Disposal Facilities Operations & Maintenance Plan

IWB Additional Information Request #1: Map showing N7L1-1531 Solid Waste Disposal Facilities Location. Note: location map taken from Google Earth.

Hamlet Response:

IWB Additional Information Request #2: As per Page 2 of 41, Section 1.4, Table 1: Contact Information update for SAO.

Hamlet Response: Updated contact list:

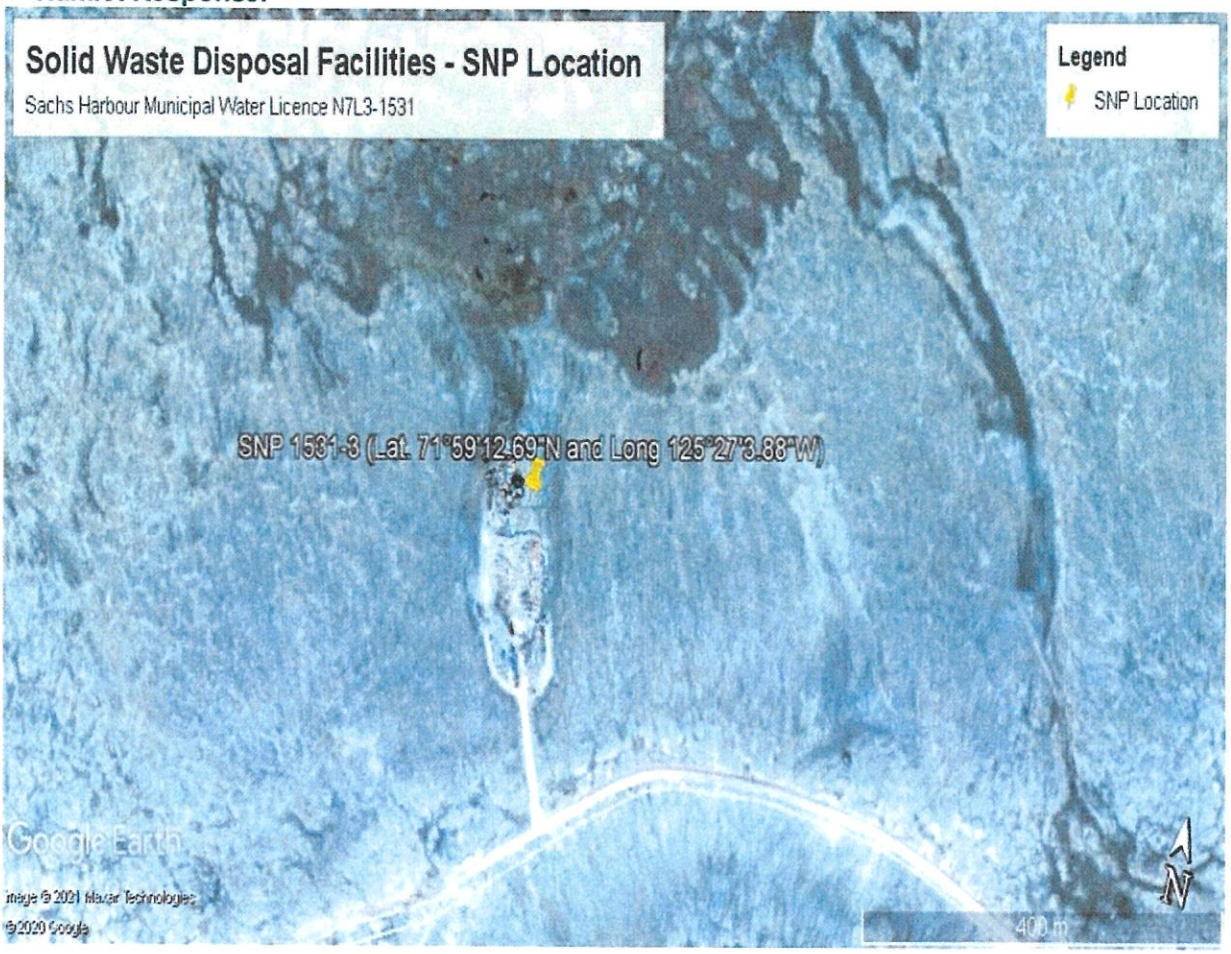
***1.4* Contact List**

The individuals responsible for the operation of the Solid Waste Disposal Facilities in Sachs Harbour are the following:

Table 1: Contact List Title	Name	Contact
Senior Administrative Officer (SAO)	Betty Haogak	(867) 690-4351 hamlet_ceo@northwestel.net
Public Works Foreman	Mr. John Elanik	(867) 786-0120
Landfill Site Operator	Variable	

IWB Additional Information Request #9: Map or drawing indicating the location of all Surveillance Network Program (SNP) sampling stations, with associated Global Positioning System (GPS) locations (Note: Google Earth latitude and longitude should be utilized as the GPS points). The map taken from Google Earth and indicates N7L3-1531 - SNP Station 1531-3.

Hamlet Response:



INUVIALUIT SIVUNNIUQPAIT IMAKKUN

INUVIALUIT WATER BOARD

October 30, 2020

Mayor Norman Anikina
Hamlet of Sachs Harbour
P.O. Box 90
Sachs Harbour, NT X0E 0Z0

Dear Mayor Anikina:

Re: N7L3-1531 - Hamlet of Sachs Harbour, Municipal Water Licence Operation and Maintenance Plans - Additional Information Request

The Inuvialuit Water Board (IWB) acknowledges receipt on October 16, 2020 of the revised Solid Waste Disposal Facilities Operations & Maintenance Plan. Upon review, information gaps have been identified. Please provide the following information prior to Board approval:

1. Location Map of the Solid Waste Disposal Facilities. Note: the location map can be taken from Google Earth;
2. As per Page 2 of 41, Section 1.4, Table 1: update contact information for SAO and resubmit Table 1;
3. Page 9 of 41, Section 3.5 describes the signage requirement at the entrance: also provide the "Hours of Operation";
4. Page 24 of 41, Section 6.2 states: "*The objective of runoff control is to control the discharge of water from the site to the receiving environment. The water leaving the site will be comprised of melt water from the spring freshet, runoff from precipitation, and leachate from the waste mass*". This section does not describe the implementation of runoff control methods. Provide a brief description of runoff control methods from the Solid Waste Disposal Facilities to be implemented.
5. Provide the year the landfill began operation (estimate if not known);
6. Number of days per week the landfill operator is on site including hours per day;
7. Page 4 of 41, Table 2: regarding estimated waste quantity generation - Is the remaining empty space larger than the space required for the next ten (10) years? If not, what are the alternative plans for landfill space requirements?
8. Waste Composition: if site specific data for Sachs Harbour is not available, use data from Page 9, Section 2.2.3, Table 2.1 of the "Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the NWT (MACA, 2003)"; and
9. A map or drawing indicating the location of all Surveillance Network Program (SNP) sampling stations, with associated Global Positioning System (GPS) locations (Note: Google Earth latitude and longitude should be utilized as the GPS points). The map can be taken from Google Earth and indicate SNP Station 1531-3.

Please note the IWB would like to remind the Hamlet of Sachs Harbour that the following additional information was requested by the Board on November 17, 2017 and due on February 16, 2018:

1. **Municipal Water Licences Operation and Maintenance Plan - Sewage Waste Disposal Facilities:**

a) Location map of the Sewage Waste Disposal Facilities;
b) Description of Sewage Waste Disposal Facilities such as: name, length, width, depth, volume and area of lagoon, freeboard, treatment methods (e.g. aerobic, anaerobic, facultative), sewage discharge chute and any other site-specific descriptions;
c) A map or drawing indicating the location of all Surveillance Network Program (SNP) sampling stations, with associated Global Positioning System (GPS) locations (Note: Google Earth latitude and longitude should be utilized as the GPS points);
d) Indicate the frequency (e.g. never, daily, weekly, monthly, annually, other - specify) for each of the following activities at the Sewage Waste Disposal Facilities:
    a. inspection of inlet and truck discharge structures for damage, blockage, settlement or erosion and their maintenance;
    b. monitoring of water level to ensure the minimum freeboard for constructed berms, dykes and dams is maintained;
    c. inspection of dams, dykes and berms for damage by animals or erosion and their maintenance;
    d. monitoring of the colour of the liquid in the lagoon as an indication of performance;
    e. sewage discharge measurement;
    f. measurement of sludge levels;
    g. removal and disposal of accumulated sludge including location;
    h. monitoring for damage to fencing/signage and gate;
    i. inspection, grading and reshaping of access road and truck pad;
    j. SNP sampling and timing; and
    k. any other activities relevant to the O&M of the Sewage Waste Disposal Facilities.

2. **Municipal Water Licences - Spill Contingency Plan:**

a) Map(s) showing the following:
    a. buildings, roads, culverts, airstrips and other infrastructure;
    b. all surface water bodies and direction of water flow including catchment basins;
    c. storage locations of each hazardous material;
    d. probable spill locations and direction of flow on land and in water;
    e. locations of all response equipment;
    f. environmentally sensitive areas;
    g. any approved disposal sites;
    h. topography; and
    i. any other important on or off-site features;
b) The name, job title and 24-hour telephone number(s) of staff and/or community member(s) responsible for activating the Spill Contingency Plan at each facility. This should include alternate staff, should the regular staff not be available; and
c) Material Safety Data Sheets (MSDS) for all chemicals, fuels and oils used in community operations.

3. **Municipal Water Licences - Hazardous Waste Management Plan** is also required and should include all information as outlined in Part E, Item 3 of the Licence.

To date no additional information has been received. Please submit two (2) hard copies and two (2) electronic copies (USB's) of the information requested above. All submitted documents, including related IWB correspondence will be placed on the IWB Public Register.

Should you have questions or concerns, please contact me at 867-678-8610 or email adhikarib@inuvwb.ca or Mardy Semmler, Executive Director, at 867-678-8609 or semmlerm@inuvwb.ca.

Sincerely,

Sgd. Bijaya Adhikari, PhD
Science and Regulatory Coordinator

cc: Betty Haogak, SAO – Hamlet of Sachs Harbour
Lloyd Gruben, ENR Water Resource Officer, Inuvik Region