TOWN OF IQALUIT
LANDFILL OPERATION AND MAINTENANCE MANUAL
FOR SITE 3 IN WEST 40

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1.0 OPERATING PROCEDURES

1.1 HOURS OF OPERATION

The summer hours of operation of the landfill (June through September) are:

Weekdays	8:00 a.m. - 8:00 p.m.
Weekends	10:00 a.m. - 6:00 p.m.

The winter hours of operation (October through May) are:

Weekdays	9:00 a.m. - 5:00 p.m.
Weekends	12:00 noon - 4:00 p.m.

Access during off hours will not be permitted. The landfill will also be closed on public holidays, with the exception of December 26 (Boxing Day).

1.2 SITE SECURITY

The landfill is surrounded by a 3 metre chain link fence to catch windblown litter and control access. The landfill has access through one gate which must be locked when the landfill is closed. Within the landfill area the public sorting of waste or scavenging at the dumping area will not be permitted under any circumstances.

The site operator may designate other areas for sorting or scavenging.

1.3 EMERGENCY PROCEDURES

Non-routine operational response may be expected for the following events:

- uncontrolled burning;
- accidental injury;
- site closure;
- accidental disposal of hazardous waste in the landfill area;
- slope instability.

The procedures for action in the event of an emergency must be available in the site building at all times. A review of all emergency procedures and preparedness should be part of the regular safety audit (every 6 months) and changes should be made where appropriate.

1.3.1 Uncontrolled Burning

Uncontrolled burning may be defined as when burning extends beyond a 10 metre width of the dumping face.

In the event that uncontrolled burning takes place at the landfill, the operator will assess the potential danger of the burning and contact the Fire Department and/or Town Roads Department to control the fire as required.

The burning area of the landfill is located in the north cell of the site. No burning shall occur in the south cell.

During the following conditions the operator should be alert to potential danger to the adjacent tank farm and fuel line as follows:

- warm summer days when the temperature is above 15°C;
- all days between May 1st and September 30th when the wind is blowing from the northwest toward the tank farm;
- the period when the tanks are being filled.

1.3.2 Accidental Injury

If a serious accident occurs on the landfill site, the operator should report it to the Town dispatch who will decide the appropriate response. This may include requesting assistance from the Fire Department, Town Roads Department, Ambulance, Bylaw, the RCMP and/or Department of Renewable Resources.

The telephone number to report spills is: (403) 920-8130.

The operator should record the circumstances of the accident as a means for preventing reoccurrence. This information shall be reviewed as part of the regular safety audit.

1.3.3 Site Closure

It may be necessary to close the landfill for unscheduled periods. Reasons for closures may include:

- uncontrolled fires;
- discovery of hazardous waste in the landfill area;
- accidents on the site;
- severe weather.

The decision to close the facility will be made by the Town or by another appropriate authority. Where appropriate, a sign will also be posted at the gate giving the timing of the closure and public service announcements will be made on CBC radio.

1.3.4 Accidental Disposal of Hazardous Waste in the Landfill Area

In case of the accidental disposal of hazardous waste in the landfill, the operator shall contact the Town Dispatch and Supervisor and close the sluice gate at the southwest corner of the landfill. Further dumping in the area of the accidental disposal should not be permitted.

- The operator should also further investigate the waste including location and characterization.
- The Supervisor will notify other authorities if required.
- The Supervisor, in consultation with the Director of Public Works, Department of Health, and Department of Renewable Resources, will decide on how to best remove the hazardous waste and any contaminated material in a way that is in keeping with the waste type.

1.3.5 Slope Instability

Temporary slopes on the working face of the landfill should be no steeper than 2 (Horizontal) to 1 (Vertical) (34°).

1.4 NUISANCE AVOIDANCE

1.4.1 Litter Control

The control of litter is a priority in the operation of the landfill, however, litter will inevitably occur. Landfill operation will be directed towards minimizing the amount of litter generated.

Two means of litter prevention will be followed:

- All loads entering or moving on the site must be covered to reduce litter.
- At the tipping face, the portable barricades should be placed downwind to catch windblown litter.

The barricades should be cleared of litter daily. Additionally, any litter bypassing the barricades and catching in the perimeters fence should be collected monthly.

1.4.2 Noise

The landfill is located well away from the public, therefore noise is not considered to be a problem for the site.

1.4.3 Dust

The generation of dust on the landfill site should be minimized at all times.

Watering the road surface may reduce dust, but it may also increase runoff within the site if not used in the proper quantity. Site experience of the operator must be used regarding the quantity of water applied to the access roads to reduce dust. A road treatment such as calcium chloride may also be applied by the Town to stabilize the road surface.

All loads entering or travelling on the site will be covered to prevent dust or litter, and vehicles will be confined to designated haul roads.

1.4.4 Snow Accumulation

Most of the access roads within the site are perpendicular to the prevailing winds, therefore snow drifting may not be a problem. Snow collected from the site will be disposed of in the south cell adjacent to, but not blocking, the site drainage culvert. Snow will not be used as a temporary cover material.

Snow accumulation within the solid waste itself may reduce the volume available on site for disposal. Snow may mix with the solid waste and remain frozen once the waste is covered. The use of burning for the proposed site development will greatly reduce the likelihood of snow accumulation and a small burning area, will further reduce any snow accumulation because of the concentrated heat of combustion.

Drifting snow and frozen ground may also interfere with the operation of a landfill site. The following operating activities may improve winter operation:

- Portable snow fencing may be used in addition to the perimeter fencing to prevent drifting snow from interfering with the operations.
- Cover material should be stock piled for winter use.

The landfill site is graded so that melting snow will drain toward the southeast corner to exit the site at the sluice gate.

1.4.5 Pest Control

The operation of the landfill will be directed to ensure that the presence of animals is limited.

Attraction to animals will be minimized by compaction, burning and sufficient covering of waste at the end of each working day.

1.4.6 Odours

The operation of the landfill will be directed to minimize the odour from the waste where possible. Odours associated with rotting waste will be minimized by the immediate dumping and burning of waste, or the compaction of waste and primary cover material of waste.

The odours associated with burning will be managed by use of favourable wind directions during burning activities (northwest or southeast winds).

1.4.7 Bird Control

The operation of the landfill will be directed to minimize the nuisance due to the presence of birds. Bird control will be facilitated by prompt placing and burning of waste, further compaction of waste and the provision of primary cover material.

1.5 FIRE SAFETY

1.5.1 Fire Fighting Equipment

A 10 kg powder type ABC fire extinguisher will be available at the site operator's building and regularly maintained in accordance with manufacturer's recommendations.

1.5.2 Surface Fires

If the burning on site spreads rapidly beyond the designated limit (10 metre width), the area should be isolated and no one should be allowed to enter the area.

If the fire cannot be controlled, then the operator should contact the Fire Department.

The Fire Department Officer in attendance will be furnished with all known information and given assistance if required. The Fire Department will be given a copy of the manual and they will be furnished with access keys for the landfill.

The cause of any such fires will be investigated and steps taken to prevent any recurrence. The operator should keep a record of any such incident, giving details of the actions taken.

1.5.3 Subsurface Fires

Subsurface fires should be assessed for danger and may be treated as an emergency; the Fire Department should be notified immediately by the landfill operator if the fire is considered to be an emergency.

If a subsurface fire is suspected, it should be investigated immediately by excavation. If a fire is confirmed, remedial action will depend on the depth and extent. It may be possible to excavate the burning materials and extinguish them on the surface. Other measures to extinguish fires may require the isolation of the burning waste with cut-off trenches and flooding the area with water.

1.6 WASTE RECEPTION

1.6.1 Reception Procedures

The orderly reception of waste carrying vehicles is important to the operation of the facility. Upon arrival at the landfill, vehicles will form an orderly line. This will be assisted by adequate sign posting and markings.

The following information will be collected and recorded on the landfill transaction forms:

- date
- vehicle type
- mailing address (for billing purposes)
- time in
- vehicle inspection details
- driver identification
- type of waste or material
- estimated volume of waste.

1.6.2 Checking Procedures

The checking of waste entering the facility is crucial to the safe and correct operation of the landfill. The site operator will carry out random checking of waste entering the site. A minimum of 5% of the total number of loads from these sources will be inspected monthly.

The inspection will be carried out by politely asking the waste carrier to pull off of the access road. The operator will explain in more detail the purpose of segregating different wastes. The operator should then ask the waste carrier if any of his/her material fits into the category of being segregated. The operator should then request the opportunity to inspect the material.

In addition to random inspection, all waste deliveries which appear suspicious to the operator or where there is a discrepancy between the appearance and the description of the waste, the load will also be checked.

1.7 HAZARDOUS WASTE MANAGEMENT

Typical household hazardous wastes include: pesticides, paint, solvents, flammable liquids, corrosive cleaners, batteries, used oil, oil filters, and other toxic materials of unknown origin. For specific substances refer to Schedule II, List II of the Federal Legislation on the Transportation of Dangerous Goods.

1.7.1 Hazardous Waste Collection

A household hazardous waste collection program will consist of a series of collections, one in the spring and one in the fall, during which citizens will bring their household hazardous waste to designated areas for collection and preparation for disposal. The collection event will last 1 day. After each collection event, where feasible, the hazardous waste will be neutralized or recycled. Over a period of 2-4 years, the accumulated waste which cannot be neutralized or recycled will be shipped to an appropriate disposal facility in the south.

The accumulated household hazardous waste shall be placed in the on-site storage containers (sealift containers). Household hazardous waste dropped off by individuals at the landfill will be also be placed in on-site storage containers (sealift containers).

1.7.2 Hazardous Waste Storage

There are several factors to consider when storing hazardous waste, these factors include compatibility, segregation, ventilation, climate/environment, handling, security, labelling, and record keeping. The site operator should obtain WHMIS (Workplace Hazardous Material Information Sheet) information from the NWT Fire Marshall for the materials to be stored on-site.

- **Compatibility**

  The compatibility between different types of hazardous wastes must be considered before storage. The compatibility of wastes with their storage containers must also be considered. The compatibility of wastes with nearby materials and equipment is also very important, particularly when dealing with flammable wastes. The site operator should review the WHMIS for this information.

- **Segregation**

  The final destination of wastes should always be considered before storage. If recovery may be possible in the future, wastes should be stored in a manner that will allow such recovery.

- **Ventilation**

  Hazardous wastes should normally be well ventilated. Volatile materials in particular can present a serious health hazard in storage. The use of sealift containers will not accommodate good ventilation, therefore, the site operator must ventilate the storage container before entering.

  Ventilation will consist of opening the access doors one hour prior to entering, and not entering without an observer to ensure that the operator is not overcome by fumes. The observer will have communication access in the event of an emergency.

- **Climate/Environment**

If any hazardous material is stored outside, containers should be covered by a tarpaulin, and preferably placed on a impermeable base. This prevents contact of rainwater and soil, keeps of the direct sunlight, and makes clean-up of any spills or leaks easier and cheaper. The area should be curbed or diked to collect spills, leaks and precipitation. This containment area should be capable of holding at least 100% of the total volume of the stored product.

- **Handling**

The WHMIS (Workplace Hazardous Material Information Sheet) guidelines should be followed in all cases when handling hazardous materials. The site operator should obtain copies of WHMIS from the NWT Fire Marshall for the materials accepted at the site.

- **Security**

Security precautions are necessary to avoid theft, accidental discharge or harm to the public. Sealift waste containers must be closed and locked when access is not required.

- **Record Keeping**

Records must be maintained to achieve safe hazardous waste storage. If quantities and types of wastes are not recorded, serious problems may result in the future. Care should be taken to ensure that containers remain properly labelled during the entire time in Storage.

The record keeping should include the following information:

- material
- quantity total (ongoing)
- dates received.

Small quantities of materials are expected to be delivered to the site, therefore, an individual list for each material may be worthwhile.

1.8 WASTE DISPOSAL

1.8.1 Tipping Face

The operator should maintain a well defined tipping face using the portable signs and portable barricades. The width of the tipping face will be in keeping with the number of vehicles likely to be at the tipping face at any time. Waste will be placed at the brow of the tipping face, unless there are valid reasons otherwise.

At the tipping face, vehicles using different means of unloading may be segregated to reduce the turnaround time of each vehicle at the discretion of the landfill operator. The slope angle of the tipping face in each cell should be no steeper than 1(V) on 5(H).

The active areas of a solid waste disposal site should be as small as possible. This is important in providing a manageable and safe disposal site for the public and operating staff. The area for combustible wastes requires particular attention because of the potential hazards of a large fire.

Minimizing the active areas of the solid waste disposal site will also reduce the exposure of the wastes to water within the site, and reduce the potential contamination of water within the site.

1.8.2 Compaction of Waste

Compaction of waste will be undertaken to fulfil the following objectives:

- Maximize waste density, thereby ensuring the optimum use of the available air space.
- Minimize primary cover requirements.
- Reduce problems of birds.
- Assist in the reduction of odour.

On a regular basis the waste should be spread into an even layer with a bulldozer equipped with a blade or bucket and then compacted by running the bulldozer over it several times. The compacted waste should be covered with suitable cover material.

The need for compaction for the proposed site development may be reduced because of the proposed volume reduction by burning of combustible wastes. Some compaction may be necessary as the working face of the disposal areas advance from the access road in order to prepare a drivable area for vehicles. This compaction could be accomplished by heavy equipment such as a bulldozer.

1.8.3 Cover Material

The waste will be deposited within a series of clearly defined cells in order to ensure concentration of disposal operations. Material for cover will be available off-site adjacent to the landfill.

The primary covering layer should be at least 0.15 m (6 inches) thick and compacted with a bulldozer. Each layer of cover material should have a slight slope so water can drain.

1.8.4 Burning

At the beginning of each day, the combustible wastes in the disposal area may be burned if the winds and weather are favourable with regard to the tank farm adjacent to the site. Unfavourable conditions are:

- when the air temperature is above 15°C;
- when the wind is blowing from the northwest between May 1st and September 30th;
- when the tanks are being filled.

The operator will monitor the fire over the course of the day and extinguish any areas of open flame before closing the site for the day.

Fire control is an important part of the operation of the site. In order to further reduce the risk of fire at the tank farm site from sparks created by combustion at the solid waste disposal site, an operating protocol will be utilized during periods of higher risk for the tank. These periods would include:

1. filling of the tank;
2. a site spill;
3. venting of the tank during high wind.

Filling of the tank may occur between August 1, and October 31, of any year. During the months of August, the winds are predominantly from the southeast, while during the months of September and October, the winds are predominantly from the northwest. The operator will maintain contact with the tank farm operator through the Town so that he knows when the tank is filling, and when burning on the site should be temporarily suspended.

A spill on the tank farm site would be contained by the containment berm, but this open fuel would be at a greater risk of combustion. The operator will also maintain contact with the tank farm operator so that burning on the solid waste disposal site may be temporarily suspended until the spill is cleaned up.

Further burning control practices should include:

1. a minimum buffer zone of 5 m around the combustion area;
2. maintaining a reasonably small combustion area;
3. restricted public access to the burning area.

1.8.5 Waste Slope Stability

The maximum angle for waste slopes will be 5(H) on 1(V) (11°) for active areas. This slope accommodates equipment access for spreading and compacting.

The maximum angle of any slopes will be 1.5 (H) on 1 (V) (37°). These slopes may comprise a temporary condition during the initial operation of a cell.

1.8.6 Recycling

A local contractor presently operates a recycling program which processes aluminum cans and glass bottles, and serves as a means of volume reduction in addition to burning at the current site. The aluminum cans and liquor bottles will be segregated and sold to the local recycling contractor.

Recycling within the site, in addition to the current program, may entail salvaging of certain construction materials brought to the site for disposal. This material may be reused by the Town or sold. Additional recycling operations may also be feasible at some time in the future.

Lumber in lengths greater than two metres will be segregated for reuse. Shorter lengths will be segregated and cut into lengths for sale as firewood.

1.8.7 Bulky Waste Area

Bulky wastes shall be deposited in a separate area of the site. These wastes do not need to be covered, however, fill material will be required to advance the driving service of the bulky waste area.

Stacking and collapsing of cars, barrels and appliances will be undertaken where possible. Hazardous materials associated with bulky waste such as fuel must be removed, by the waste generator, prior to bringing the material to the land site.

Where feasible, bulky waste items such as appliances, barrels and waste metal shall be segregated for recycling or reuse.

1.9 ADDITIONAL LANDFILL ACTIVITIES MANAGEMENT

1.9.1 Surface Water Management

Surface water will be controlled within the site to minimize the possibility of discharging contaminated runoff. Steps have been taken to intercept possible water courses outside the landfill using ditches to move surface water away. The ditching on the site will be maintained by the Town to provide positive drainage. The site operator should observe when ponding is not draining away.

1.9.2 Scavenging Management

Uncontrolled scavenging by local residents will not be allowed at the disposal site. Uncontrolled and unauthorized scavenging is dangerous and unnecessary. Controlled access to the storage area adjacent to the landfill operator building will be allowed.

1.9.3 Spring Cleanup Operations

Once a year, after the snow has melted, the Town will organize a spring clean-up to collect loose waste around the landfill that has accumulated and was once buried by the previous winter snow.

1.10 SITE RECORDS

1.10.1 Waste Records

Details of each waste delivery will be kept in the form described in 1.6.1. Transaction forms shall be submitted to site supervisor on a biweekly basis.

1.10.2 Site Monitoring

The landfill is subject to monitoring by the Town, the NWT Water Board and the Baffin Region Health Board. These records will be maintained in a current state at the site and the Town office. The monitoring data will be shared to all these parties as it becomes available.

Sampling of runoff from the landfill site shall take place on a monthly basis (May through October) at the inlet to the discharge culvert at the southwest corner of the site. Samples shall be taken in accordance with instructions of Supervisor.

1.10.3 Site Development

Weekly records of the progress of the landfill will be maintained on site by the operator. These will chart the progress of the landfill within the planned development of each landfill cell.

An annual topographic survey of the landfill will be undertaken by the Town to provide a continuous record of site usage and to assess the site utilization. The development will also be photo documented by the Town.

1.10.4 Landfill Audit

An audit of landfill operations will be undertaken by the Town annually. This will include a record of the following:

Access Routes/Signs	On-Site Drainage	Site Office
Gates and Fencing	Disposal Operation	Equipment Storage
Waste Handling	Waste Types	Safety
Segregation	Bulky Items	Site Records
Waste Handling Equipment	Lighting	Previous Audit Information
Staffing Levels	Depth of Tipping Face	Complaints
Litter Control	Width of Tipping Face	Dust
Birds	Primary Cover	Noise
Odour	Tidiness	
Fires	Hazardous Waste Collection Handling, Storage and Disposal	

The Town will remedy any part of the operations which is not in accordance with the Operating Plan, or accepted good standards for landfill operations.

1.10.5 Activity Summary Report

A bimonthly Summary Report will be compiled by the landfill operator. The report will include the following information:

- location of active landfilling area and the activities related to cell filling;
- summary of the weather for the month;
- summary of site maintenance and litter control activities;
- summary of infractions and problems and the measures undertaken to resolve;
- summary of surveillance network point (SNP) sampling.

1.11 SPECIFIC SAFETY ITEMS

- Personal Safety Equipment and Activities
  - Always wear coveralls, water-proof and puncture-proof gloves, and safety boots.
  - Never wear working clothes home.

- Your hands should always be washed thoroughly after work, before eating, or after contact with waste.
- Stand clear of burning wastes since toxic fumes, smoke and exploding aerosol cans can be harmful.
- Never leave burning wastes with open flames at the site.
- Check with your doctor to make sure that the appropriate vaccinations have been received and that they are up to date.
- Lift with your legs, not your back.
- Do not handle hazardous wastes if you are not properly trained to do so.
- Take appropriate precautions when operating the equipment.

- Occupational Health and Safety Requirements - **Refer to GNWT Safety Act and General Safety Regulations**
- Emergency Procedures - Refer to Section 1.3.

The operator has the responsibility to make sure that all aspects of solid waste disposal are conducted safely.

2.0 MAINTENANCE

The inspection maintenance of the following site facilities will be conducted on a routine basis according to a Schedule of Maintenance that is relevant to each aspect of the operation:

- site equipment (signs, barricades, building, storage containers);
- site infrastructure (roads, drainage, fencing, berms);
- site services (lighting, telephone).

This aspect of the solid waste disposal system is frequently neglected in most NWT communities. **The maintenance aspect is one of the most important components of an solid waste disposal site.**

2.1 SITE EQUIPMENT

2.1.1 Signs and Barricades

Signs within and adjacent to the site should be inspected by the operator on a monthly basis. Signs should be inspected for wear and breakage of the mounting systems and wear of sign lettering. Any signs requiring repairs should be reported to the Supervisor so that repair may be undertaken.

Site barricades should be inspected on a monthly basis and the need for repairs should be reported to the Supervisor.

2.1.2 Building

The operator should inspect the building exterior on a monthly basis to observe any signs of general building deterioration and advise the Town of necessary repairs. Any problems with the services within the building, such as heat, light, water and lavatory, should also be reported to the Supervisor.

2.1.3 Storage Containers

The operator should inspect the exterior of the storage containers on a biweekly basis to observe and record any signs of deterioration and advise the Supervisor of observations.

2.2 SITE INFRASTRUCTURE

2.2.1 Roads

The access road for the solid waste disposal site should be maintained properly at all times. The frequent use of heavy equipment may cause the road to deteriorate significantly. Adequate road maintenance should include the following points:

- Potholes can be filled with stockpiled material.
- Roads should be reshaped as required to provide proper drainage.
- Snow should be removed as necessary and deposited in the south cell.
- Wastes fallen from the collection vehicle during hauling should be collected from the roads and surrounding areas.
- In dry weather roads should be sprayed with water to control dust.
- A good granular base should be maintained on the road.

2.2.2 Drainage

Drainage from the disposal site should be checked monthly from June through October to ensure that blockages have not developed in the swale or discharge culvert. Any blockages or ponding should be recorded and reported to the Supervisor by the operator.

2.2.3 Fencing

The operator should examine the fencing for holes and check fence posts for frost heave. Wind blown material should be removed from the fence to reduce wind loading and improve the appearance of the site.

2.2.4 Perimeter Berms

The perimeter berms of the landfill site should be inspected on a monthly basis from May through October. Any signs of erosion to the berms should be recorded and reported to the Supervisor.