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City of Iqaluit Landfill Operations and Maintenance Manual

Project number: 60571501 (500)

December 18, 2018

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AECOM: 2015-04-13

Revision History

Revision	Revision date	Name	Details
0	December 5, 2018	Jim Clare	Draft
1	December 18, 2018	Jim Clare	Final

Distribution List

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1. Introduction

1.1 Purpose

The purpose of the City of Iqaluit Landfill (the Landfill) Operations and Maintenance Manual (the Manual) is to provide the landfill management and operating staff with a guidance document to carry out operations in a practical and reasonable manner and for maintaining regulatory compliance. The Manual provides a basis for:

- Involving operating staff in decision making for daily activities
- Policy and procedure reference document for operating staff
- Employee training
- Orientation of new employees

Given that there are no standards or guidelines for operations and maintenance of landfills in Nunavut, the Guidelines from Northwest Territories are used as reference of this manual. Therefore, this Manual is consistent with the requirements set out in the *Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories*, April 2003. This document will serve as the Guidelines for the purpose of the Manual.

1.2 Reference

Reference information that should be reviewed by operating staff includes the following:

- Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories, April 2003. (Available online at http://www.maca.gov.nt.ca/?page_id=1765)
- Guideline for the General Management of Hazardous Waste in Nunavut (2010). (see Appendix C)
- End-of-Life Vehicle Hazardous Materials Recovery Program Manual Operation (2011) (see Appendix D)

1.3 Content

This Manual provides an overview of the Landfill design, operating plan and specific site features. In addition, this manual provides recommended procedures and “appropriate or best practices” for site operations and management. Updates to this manual are to be recorded in Table 1.

1.4 Due Diligence

Due diligence can be defined as: *“the taking of all reasonable steps as part of the due care and attention to prevent the occurrence of an accident or mishap, as well as having a contingency plan to control an incident and limit any consequential damage”*.

Due diligence includes policy development, planning and goal setting, implementation of “best management” practices, checking and corrective action, and management review. Best management principles include:

- Good housekeeping
- Preventative maintenance
- Inspections and record keeping
- Security
- Employee hiring and training
- Incident reporting

- Operations procedures
- Emergency response planning
- Risk identification and assessment
- Review and corrective action

Table 1: List of Manual Revisions

Section	Date of Revision	Replaces (Date)	Purpose of Revision
1	November 2018	January 2014	Up date
2			

1.5 Site Description

1.5.1 Location

Iqaluit is a rapidly growing Baffin Island community and is the Capital of Nunavut Territory. It is located at the south end of Baffin Island, on Frobisher Bay at 64 º 31' N latitude and 68 º 31' W longitude. Access is provided by commercial aircraft year-round, and sea-lift from the port of Montreal in the summer. Annual precipitation in the Iqaluit area is approximately 255 cm of snowfall and 19.2 cm of rainfall. Average annual temperatures range from a low in January of approximately -29.7 degrees Celsius (^{0}C) to a high of approximately 11.4 ^{0}C in July.

Iqaluit has developed into the eastern Arctic's largest community. In order to minimize the impact of the community on this environment, it is imperative that the solid wastes produced by the community are carefully managed.

The location of the solid waste disposal facility relative to the community is shown in Figure 1.1.

The solid waste disposal site is located in West 40. This site was built in 1995 and was intended as an interim landfill site until the location of a long term operating site could be identified and implemented. In 2001 and 2006, the Landfill was expanded to extend its lifespan and a water surface water management system was installed. Waste disposal techniques at that landfill include compaction and covering with soil materials wood waste when available.

2. Organizational Structure

In the City of Iqaluit, the Department of Public Works and Engineering is responsible for municipal solid waste (MSW) management, which includes collection of residential and commercial waste, and the management of the Landfill.

2.1 Duties and Responsibilities

2.1.1 Director of Public Works and Engineering

The Director of Public Works and Engineering (Director) is responsible for solid waste management of the City. Duties of the Director for landfill management include:

1. Administration
   - Preparation of operating budgets
   - Maintenance of operating records and administrative reports
   - Environmental monitoring and Reporting
   - Meeting and administrative reports
   - Monthly and annual reports, as required by the Nunavut Water Board License and Chief Administrative Officer (CAO)
   - Staffing
   - Authorize policies pertaining to landfill operations
   - Report to Council, as required by the CAO
2. Planning and Development:
   - Work with Engineering Department to oversee capital development projects
   - Review the overall operations to monitor that development is according to current engineering plans
   - Review and implement plans for reclamation of completed portions of the site
3. Regulatory Compliance:
   - Sampling required under the City's Water License
   - Review and submit required monitoring reports
   - Review landfill audits
   - Work with Engineering Department to review and submit other landfill related documentation to Nunavut Water Board (NWB)
4. Public Communication:
   - Respond to public and media inquiries
   - Address any complaints
5. Policies
   - Responsible to review and update all Landfill policies
6. Safety
   - Make safety training available to staff

2.1.2 Superintendent of Public Works

The Superintendent of the Department of Public Works is responsible for the management of the Landfill and reports to the Director of Public Works. Duties of the Superintendent include the following:

1. Planning and Development of the Landfill:
   - Coordinate the overall operations to ensure development is according to the current engineering plans
   - Plan for reclamation of completed portions of the site
   - Schedule and coordinate shipment of hazardous materials to accredited southern waste management facilities
   - Schedule and coordinate shipment of non-hazardous materials to southern recycling facilities as required
2. Regulatory Compliance:
   - Oversee the completion of the monitoring program and the preparation of required monitoring reports
   - Prepare and submit to the Director other related documentation required by the NWB
3. Safety
   - Ensure staff receive applicable safety training
   - Ensure staff are familiar with the site safety plan

2.1.3 Landfill Foreman

The Landfill Foreman reports to the Superintendent and is responsible for overseeing vehicular traffic and day-to-day operations of the Landfill. At the site entrance, the Landfill Foreman provides the first level of contact with the landfill customer and must provide all initial waste screening requirements. Duties of the Landfill Foreman include:

1. Gate Operations:
   - Control vehicles entering and exiting the landfill and record the amount of waste received for disposal and recycling
   - Identify wastes entering the Landfill and screen for prohibited wastes
   - Direct site users to appropriate disposal or storage location
   - Communicate with other Landfill Operators to assist in their waste screening responsibilities
   - Report to Superintendent in cases of rejecting waste
   - Collect tipping fees as per the City's Solid Waste Bylaw
2. Vehicle Spotting and Waste Inspection:
   - Direct site users to appropriate disposal or storage areas
   - Direct vehicles to safe area for unloading
   - Visually inspect wastes and spot prohibited wastes
3. Site Maintenance:
   - Carry out winter and summer maintenance of roads and drainage ditches
   - Collect spilled and wind-blown debris and litter
4. Equipment Operations:
   - Pile wood
   - Spread and compact wastes on the working face
   - Maintain the tipping pad free of debris and hidden obstacles

- Maintain equipment

5. Planning and Development of the Landfill:
   - Plan daily working face operations to comply with the overall Landfill fill plan
   - Work with Superintendent to plan disposal area construction
   - Work with Superintendent to conduct landfill audits/inspections
   - Coordinate the overall operations to ensure development is according to the current engineering plan
   - Manage storage compounds
6. Regulatory Compliance:
   - Maintain landfill operations within regulatory requirements
   - Complete landfill audits as required
   - Take corrective action for minor issues of non-compliance and notify the Superintendent
   - Recommend corrective action to the Superintendent for major items of non-compliance
7. Monitoring of surface water and waste disposal including:
   - Maintain drainage system and manage surface water as required under Water Licence No.3AM-IQA1626
   - Oversee the overall operations of surface water management to ensure no water is pounding on site and run-off outside the Landfill area; development is according to the current engineering plans
   - Perform and document regular visual inspections of the Landfill perimeter berms
   - Complete monitoring required under the Water License No.3AM-IQA1626
8. Planning and Development of the Landfill:
   - Plan daily working face operations
   - Work with Superintendent and Landfill Operator to plan disposal area expansion and soil cover supply
   - Work with Superintendent and Landfill Operator to conduct landfill audits/inspections
9. Administrative Duties:
   - Schedule delivery of fuel, oil, and supplies
   - Maintain daily operating records
10. Safety:
    - Administer the Site Safety Plan
    - Conduct Safety Orientation for Visitors and Contractors

2.1.4 Landfill Operator

The Landfill Operator (Operator) is responsible for performing duties as assigned by the Landfill Foreman. These positions would typically address both ongoing and periodic general site operation and maintenance requirements. Duties of the Operator include:

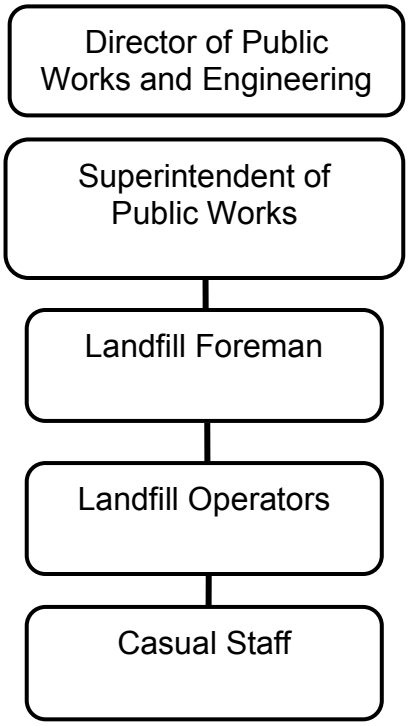
1. Vehicle Spotting and Waste Inspection:
   - Direct site users to appropriate disposal or storage areas
   - Direct vehicles to safe area for unloading
   - Visually inspect wastes and spot prohibited wastes
2. Site Maintenance:
   - Carry out winter and summer maintenance of roads and drainage ditches
   - Collect spilled and wind-blown debris and litter

3. Equipment Operations:
   - Pile wood
   - Place and compact cover soil
   - Maintain the tipping pad free of debris and hidden obstacles
   - Maintain equipment
4. Safety
   - Familiarise and adhere to the facility safety plan

2.2 Organization Structure

The organization structure for the City of Iqaluit Landfill is illustrated in Figure 2.1.

Figure 2-1: Organization Chart - City of Iqaluit Landfill



2.3 Contact List

The individuals responsible for the operation of the solid waste facility in Iqaluit are listed in the following table:

Table 2: Contact List

Title	Phone Number
Landfill Foreman	(867) 222 - 2946
Superintendent of Public Works	(867) 979-5637
Director of Public Works and Engineering	(867) 979-5653

2.4 Personnel Training

Every landfill employee must be trained to perform his or her job in a safe and environmentally responsible manner, in accordance with applicable regulations. Employees will be kept current with changes in regulations and technology through ongoing applicable training courses as regulations and the technical aspects of landfill operation require. Specific training topics may include hazardous waste management, surface water control, spill prevention, first aid and safety.

Continued on-the-job training will be provided to all employees. The training will emphasize the safe and environmentally sound operation of the Landfill. A review of this Operations and Maintenance Manual will be a prerequisite for any employee before being declared eligible for work at the Landfill. All employees will be provided with safety training covering all equipment and systems, with which they will be expected to operate on a daily basis. The use of personal protective equipment (PPE), and the handling and precautions associated with hazardous wastes, will also be included in the safety training.

A training program for more specific tasks, such as those of mobile equipment operators will be documented with written records of meetings and types of instruction. This instruction will include identification of hazardous wastes and unacceptable wastes; emergency procedures in case of fire, spill or injury; confined space entry; respirator use; and other issues that may periodically arise. As required, individuals must be trained in Confined Space Entry, Transportation of Dangerous Goods (TDG) and/or Hazardous Waste Management, Workplace Hazardous Material Information System (WHMIS), and practice proper safety procedures in accordance with applicable legislation and the requirements of the Workers Safety and Compensation Commission (WSCC). Documentation will also be kept on file at the Site Owners office and reviewed annually for any necessary updates.

3. Governance

3.1 City of Iqaluit Solid Waste Bylaw

The Landfill operator and staff must adhere to the City's waste management By-law identified in Appendix G.

3.2 City of Iqaluit Water License

The City of Iqaluit Landfill must operate within the terms and conditions set out in the Licence No. 3AM-IQA1626/Type "A" issued by the NWB to the City of Iqaluit. This Licence is effective June 17, 2016 and expires June 16, 2026. Under this licence, the City is entitled "to use water and disposes of waste associated for municipal undertakings". Appendix H includes a copy of Water License No. 3AM-IQA1626.

3.3 Acts, Regulations and Guidelines

3.3.1 Acts and Regulations

In addition to the Water Licence, the Landfill must be operated within the *Nunavut Environmental Protection Act (1998)* (EPA) and its associated Regulations, *Environmental Right Act (1988).* The EPA was amended in 1998 and came into force in April 1, 1999. It creates a framework for an integrated approach to protect the environment including air, land, water, and all organic and inorganic matter and living organisms.

The operations of the Landfill must also comply with *Nunavut Safety Act and Regulations* to protect Landfill operators, visitors, customers, or anyone at the Landfill site.

3.3.2 Guidelines

Relevant Government of Nunavut guidelines that may be used as additional reference information in the operation and maintenance of the City of Iqaluit Municipal Landfill are listed below. These documents can be viewed on the Nunavut Department of Environment (DOE) website https://www.gov.nu.ca/environment/information/documents/195%2C184

- Waste Lead and Lead Paint (2014)
- Used Oil and Waste Fuel
- Biomedical and Pharmaceutical Waste
- Waste Batteries (2011)
- Waste Solvent (2011)
- Waste Paint (2010)
- Waste Asbestos (2011)
- Waste Antifreeze (2011)
- Ozone Depleting Substances (2011)
- General Management of Hazardous Wastes (2010)
- Dust Suppression
- Mercury-Containing Products & Waste Mercury (2010)
- Guideline for Burning and Incineration of Solid Waste (2012):
- Environmental Guideline for Used Oil and Waste Fuel
- Environmental Guideline for Used Oil and Waste Fuel

The document *End-of-Life Vehicle Hazardous Materials Recovery Program Manual* 2011) prepared for the DOE may be used as a reference for End of Life Vehicles operational procedures. It is available on the DOE's website at https://www.gov.nu.ca/sites/default/files/final_-_elv_program_manual_-_jan_10_2011_0.pdf.

The guideline for managing landfills in the NWT can also be used as a reference for managing waste disposal facilities in Nunavut. This guideline is "*Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories (2003)".* This guideline promotes effectiveness and efficiency of municipal solid waste landfills. It is available for download on the NWT MACA Solid Waste Management webpage: https://www.enr.gov.nt.ca/sites/enr/files/guidelines/solidwaste_guidelines.pdf

4. Site Facilities

All solid waste management facilities associated with the Landfill are located within the limits of the site development, with the exception of the offsite runoff retention pond and leachate treatment pond. These facilities include:

- A site office located near the entrance to the Landfill site
- Garage
- Scrap metal area
- Scrap tire collection area
- Hazardous waste depot
- On-site runoff collection ponds
- White metal collection
- E-waste collection
- End-of Life vehicle decontamination area
- Cardboard burn facility

4.1 Recycling Storage Facilities

The site includes storage areas for recycling of bulky materials including:

- Scrap metals
- Car bodies
- Appliances/refrigerators and freezers
- Scrap tires
- E-waste

Public sorting of waste or scavenging is not permitted within the disposal area of the Landfill.

4.2 Hazardous Waste Area

This site includes storage areas for household hazardous waste (HHW) including:

- Paints and Solvents
- Batteries
- Cleaning Products
- Automotive Products (antifreeze, motor oil, car batteries, brake fluid, transmission fluid)
- Small propane tanks and cylinders

4.3 Landfill Disposal Operating Area

The existing municipal waste operating area is operated using the area method and functions as a natural attenuation system without a liner. The site is underlain by bedrock, silty sand and permafrost.

4.4 Equipment

The list of landfill equipment includes:

- Cat 816F Land Compactor
- Cat 928G Loader
- Ford F250 With tidy tank for refueling
- Ford F250

4.5 Surface Water Management

Surface water is managed within the Landfill by a series of perimeter berms that collects contains on-site within the Landfill. On-site runoff is pumped to an off-site retention pond for storage. It is then treated prior to discharge to Koojesse Inlet.

5. Site Security and Control

5.1 Supervision

At least one employee will remain at the site during all hours that the facility gates are open for public access.

Upon arrival, all vehicles entering the Landfill site shall report to the Landfill Operator. Following load check and documenting the waste load, Landfill customers will be directed to the appropriate disposal or storage area for disposal of the waste.

5.2 Hours of Operations

The City of Iqaluit establishes the operating hours of the Landfill and posts these hours, at the entrance. The Hours of Operations Policy is subject to change and is included within the Policy Section of this manual.

In the event of an emergency or as deemed necessary, the Landfill Operator may provide access to the site at alternate times with prior arrangement and approval.

5.3 Gate Controls

Traffic enters and exits the Landfill via the existing access road approximately 4 kilometres (km) from the city center. The Landfill is surrounded by a chain link fence and has controlled access through one gate at the Landfill entrance. Access to the Landfill is gained through the main entrance gate located at the west side of the site. The gates will be closed and locked outside of the normal operating hours.

Public sorting of waste or scavenging is not permitted within the disposal area of the Landfill.

Gate Control - Landfill Foreman is responsible for ensuring the gates are locked and secure after hours. The Foreman will ensure that no persons remain in the Landfill before the gates are locked.

Key Control - Access keys are assigned to the Superintendent and Landfill Operator, and potentially to other authorized personnel, to limit circulation of keys.

Emergency access keys are kept at the office of the Department of Public Works and are under the control of the Superintendent and Director of Public Works.

5.4 End-of-the-Day Closure

At the scheduled closing time, the Landfill Operator will secure the site by closing and locking the main entrance gate. “End-of-the-day closure” includes:

- Checking for customers and visitors that may be remaining on the site
- The Landfill Operator will remain at the gate to allow exit of any customers or visitors remaining at the site
- Closing and locking the entrance gate once all customers and visitors have left the site
- Conducting backup for collected data
- Checking site building to ensure there is no one present and that all doors are locked
- Conducting a final check of the working face to ensure the area is secure and there is no evidence of fires
- Closing and locking the access road gate

6. Customer Service

6.1 Guiding Principles for Customer Service

Customers of the Landfill will form opinions on what they see and how they are treated. A positive experience builds trust and confidence in the site operations and will assist in gaining co-operation on future visits.

To meet this objective, the following are guiding principles to assist the Landfill employees:

- Be positive and enthusiastic
- Keep the site, facilities, and equipment in a clean and orderly fashion
- Be involved in decision making and support the decisions of co-workers
- Be open-minded to compromises and ideas
- Be flexible with customers with reasonable discretion
- Show respect for the customer
- Assist the customer within reasonable limits
- Communicate and educate the customer
- Provide effective and efficient service
- Create “win/win” solutions that satisfy the customer, with consideration for public safety, financial considerations, and Landfill operations
- Treat the customer as we would want to be treated at their place of business

6.2 Assisting Customers with Vehicle Problems

In the event that a customer experiences problems with their vehicle, the Landfill Operator should provide assistance so that the vehicle and driver are:

- In a safe situation
- Out of the way of other customers
- Looked after so that appropriate help is provided

Assistance for vehicle problems may include:

- Assisting the vehicle driver to phone a tow truck
- Either assisting or arranging for someone to assist the driver to change a flat tire

Vehicle drivers must be informed of any risks or liabilities that may be involved in providing assistance, such as towing vehicles. Any actions taken are to be at the discretion of the Landfill Operator, with customer satisfaction and safe operation of the Landfill in mind.

6.3 Public Inquiries

The public, regulating agencies, or the media may ask questions to the Director, either directly or by phone. The Director should politely request any individual making an inquiry to identify themselves in order that the questions may be appropriately responded to.

The following are general guidelines for responding to inquiries:

1. If questions are of a general nature (i.e. hours of operations), the employee should provide these answers along with any relevant printed information that may help
2. Inquiries should be referred to the Superintendent if the questions are related to the following:
    a. Technical issues

   b. Regulatory issues
   c. Financial issues
3. Inquiries received from regulatory agencies or the media should be referred to the Director
4. If a question is asked and the employee does not know the answer, the employee should say so and refer the person to the Superintendent
5. If an employee is unable to take the time to answer a question because of a heavy work load during peak periods, the employee should:
   a. Explain the situation
   b. Ask the person to leave their name and phone number so that someone may call back at a less busy time

7. Waste Acceptance Procedures

7.1 Accepted and Non-Accepted Wastes

7.1.1 Accepted Waste

Any waste disposal operation 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 Owner shall allow only those materials to be deposited at the Iqaluit Landfill for which the facility has been designed for with the exception of unique circumstances reviewed in consultation with regulatory agencies.

Acceptable wastes are listed below:

- 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
- Construction & Demolition wastes (provided the waste is not a hazardous or banned material)

Household Hazardous Waste Streams such as:

- 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)
- Pesticides and herbicides
- Small propane tanks & cylinders (Barbeque tanks)
- Miscellaneous Hazardous Materials (household batteries, photographic chemicals, pharmaceuticals, aerosol sprays)
- Biomedical wastes/ash that have been incinerated, and cooled prior to disposal

7.1.2 Non-Accepted Waste

Wastes which present a danger at the Landfill Site, 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. To some extent, the acceptability of large quantity wastes must be at the Site Owners 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.

A list of materials which MAY NOT be accepted for placement in the Landfill is as follows:

- Contaminated soils
- Explosives or highly combustible materials of any nature
- Large volumes of waste oil and fuel (more than 5 Litres per load)
- Gas cylinders, unless the valve has been removed and the cylinder properly drained by a professional trained in handling gas cylinders
- Radioactive materials
- Mercury
- Industrial/Commercial Hazardous Waste
- Drums with unidentified contents
- Large volumes of fuel tank sludges from tank farms
- Hot ashes
- Any liquids, or liquid waste, of a quantity greater than five Litres in any one load
- Biomedical wastes that are not incinerated or autoclaved prior to disposal
- Waste pharmaceuticals
- Polychlorinated Biphenyls (PCBs) or PCB contaminated materials
- Any other materials not listed as acceptable or conditionally acceptable with the approval of the Site Owner

7.2 Segregation of Materials

Materials accepted at the Landfill for recycling that require segregation from general waste include:

- Appliances containing CFCs
- Automobile batteries
- End of Life Vehicles
- Paint
- E-waste
- Propane tanks
- Scrap tires

7.3 Waste Acceptance Screening Procedure

Among the most important duties of the Landfill Operator are to ensure that wastes are properly and thoroughly screened, and if any unacceptable wastes are found, that they are safely managed. The community must be aware of the screening activities and their results.

Screening the Waste

Vehicles delivering waste to the Landfill are required to report to the Landfill Operator. The first point of on-site contact is at the gate, which allows for an initial screening process. It is not possible to screen the contents of packer trucks and transfer vans at the gate. Screening of these vehicles' contents must be done at the working face.

The second point of on-site contact is at the disposal area where vehicles are unloaded. The Landfill Operator will visually inspect loads. The Landfill Operator should look for any waste that does not fall within any of the acceptable waste types as listed in Section 7.

Hazardous or other waste that has received prior approval for shipment to the Landfill should be inspected to verify that it fits the description provided by the generator. The waste load should be inspected and clearly classified prior to being pushed or compacted.

Know Your Generators and Haulers

It is important to know the potential sources of prohibited wastes from the service area. Some examples are:

- The automotive repair industry generates solvents, paint wastes, lead acid batteries, grease and oil
- Medical and dental clinics generate bio-medical wastes
- Individuals may bring in batteries, paint, oils, spent fuel, etc.

Be cautious in accepting wastes from unknown, unlicensed, or otherwise questionable haulers.

The Landfill Operator will also identify suspicious wastes based upon visual and odor characteristics. Indicators of suspicious wastes may include:

- Hazardous signage or markings
- Liquids
- Powder or dusts
- Sludge
- Bright or unusual colours
- Drums or commercial size containers
- Chemical odours
- Smoke

General information obtained from the waste hauler shall include:

- Time and date of visit to the Landfill
- Vehicle identification/license number
- Source and nature of the waste disposed of

Inspection Safety Considerations

The Waste Inspector will wear the following safety clothing during inspection:

- Coveralls
- Safety boots
- Gloves
- Safety vest
- Face mask as required
- Eye protection

Where a load is rejected and turned away from the Landfill, the Landfill Operator will attempt to secure the following information:

- Vehicle type and license number
- Identifying company names or addresses
- The source of the waste

- Name and description of the vehicle driver
- Details of the load inspection and reasons for rejection

Emergency Handling

Should an emergency situation occur such as a spill, procedures outlined in Appendix I – Landfill Emergency Response Plan will be implemented. A copy of the Emergency Response Plan will be kept on site.

Procedures (beyond spill response) in such events involve:

1. Place notification call to the Environment Protection Division of the Department of Environment, NU as outlined in Section 13.12 and 15.6
2. Confirm and record the name and phone number of the contact person
3. Obtain and record the name and address of the company responsible for the emergency disposal or storage
4. Determine the nature of the material, handling procedures and necessary precautions to be taken.
5. Contact the Superintendent
6. Arrange for the Landfill Operator to remain after hours, if required
7. If material requires covering or handling with landfill equipment, contact the Landfill Operator.
8. If the responsible company does not have an account, information and collection of fees for the service will be done by the Public Works Department of the City of Iqaluit

8. Waste Handling

8.1 Overview

The nature of wastes accepted at a landfill requires that different types of materials be handled in different ways. Although there are special cases where the Landfill Operator must make a “best judgment” on how to handle a particular material, there are accepted procedures for most products in the waste stream. If the type of waste is unknown, then the operator should not accept the waste material until it can be verified.

8.2 Recyclable Materials

Procedures for managing recyclable materials delivered to the Landfill are outlined below.

Bulky Metals

Metals are stored in the designated storage area. Alternative storage areas may be designated by the Landfill Operator for temporary storage and should be located where there is available room to unload vehicles and load recycling transport vehicles.

Metal piles should be sorted and organized to improve marketing potential. Metals may be sorted as cast iron, pared metals, tin, wire/cable, car bodies, and appliances.

Appliances that may contain CFCs (refrigerators, freezers, and air conditioning units) are to be set aside so that the CFC contents can be purged by a qualified individual as outlined in the Guideline for Ozone Depleting Substances.

Tires

Tires will be loaded and stored on-site in a designated shipping container in the recycling area. Tires hauled by individuals will be accepted for storage in the recycling area. Once a shipping container is full it will be sealed and prepared for shipping to a tire recycler. The Superintendent will contact tire haulers/processors in the NU, if available, or in another provinces to arrange for recycling

E-Waste

All e-waste (i.e. T.V’s, radios, cell phones, radios, computers and accessories, etc.) will be accepted and loaded and stored on-site in a designated shipping container in the recycling area. Once a shipping container is full it will be sealed and prepared for shipping to an e-waste recycler. The Superintendent will arrange with local haulers/processors to arrange for recycling.

Paint

All waste paint will be loaded and stored in a designated shipping container in the recycling area. Once the container is full the container shall be sealed and arrangements made with the local processor to arrange for proper disposal and recycling. Any paint cans that are empty, and the paint is film dry, can be disposed of in the Landfill.

Automotive Batteries

All automotive batteries are to be accepted, loaded and stored in acceptable shipping containers. The batteries must be stored off the ground in weather proof containers or storage building. Superintendent shall make arrangements to have all stored batteries shipped to an approved recycler on an annual basis. Refer to Automotive Battery Policy

Propane Tanks

Only propane tanks that are empty and valves open shall be accepted. Any accepted propane tanks shall then have the valves removed. Once the valves have been removed the tanks can then be stored in the scrap metal storage compound. Refer to Propane Bottle Policy for proper management.

8.3 Hazardous Waste

Hazardous waste materials which are household in origin are to be treated or stored in the hazardous waste disposal area. Hazardous wastes from commercial/industrial sectors will not be accepted at the Landfill. In accordance with the Nunavut Waste Guidelines, all hazardous waste generated by commercial and industrial activities are to be demobilized south by the waste generator.

The hazardous waste storage area has sea lift containers for storage of wastes. This area is surrounded by fence and has a separate gated entrance from the main road.

Due to the danger of handling hazardous wastes, the handling, packaging, storage, treatment of the wastes should only be completed by personnel trained in Transportation of Dangerous Goods (TDG) and/or Hazardous Waste Management and WHMIS.

8.3.1.1 Hazardous Waste Definition

Hazardous wastes as those wastes which, due to their nature and quantity, are potentially hazardous to human health and/or the environment and which require special handling and disposal techniques to eliminate the hazard. A hazardous waste includes products, substances or organisms which, by their nature, satisfy the requirements of being a dangerous good as defined in the Federal Transportation of Dangerous Goods Act.

The Transportation of Dangerous Goods Act recognizes nine classes of dangerous goods which are considered hazardous.

Those products, substances, or organisms that would be considered hazardous generally include the following Classes of waste as defined in the Transportation of Dangerous Goods Act.

- Class 1 - Explosives
- Class 2 - Compressed gases
- Class 3 - Flammable and combustible liquids
- Class 4 - Flammable solids
- Class 5 - Oxidizing substances
- Class 6 - Poisonous, toxic and infectious substances
- Class 7 - Nuclear substances
- Class 8 - Corrosives
- Class 9 - Miscellaneous products, substances or organisms that may pose a risk to life, health, property or the environment

Typical household hazardous waste which can be expected to be stored at the Landfill 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)
- Pesticides and herbicides
- Small propane tanks and cylinders (Barbeque tanks)
- Miscellaneous Hazardous Materials (household batteries, photographic chemicals, pharmaceuticals, aerosol sprays)

8.3.1.2 Hazardous Waste Collection

Household hazardous waste can be dropped off at the Landfill during operating ours, this allows the Landfill Foreman to ensure that the hazardous waste entering the Landfill is residential and not commercial.

Any known hazardous wastes spotted in the general refuse area of the Landfill will be relocated to the hazardous waste area by trained personnel.

8.3.1.3 Hazardous Waste Storage

The accumulated household hazardous wastes shall be placed in the on-site storage containers by trained personnel. Once the wastes have accumulated a significant volume, they will be prepared and shipped to a southern disposal facility.

The site operator should be trained in WHMIS and Transportation of Dangerous Goods (TDG) and/or Hazardous Waste Management. The current Material Safety Data Sheets (MSDS) must be kept on site for all products stored at the site. Supplier or workplace labels must be placed on all containers which hold a hazardous waste.

Factors to be considered when storing hazardous waste include compatibility, segregation, ventilation, climate/environment, handling, security, labeling, record keeping, and emergency response. The following summarizes some of the factors that will considered when dealing with hazardous wastes.

Compatibility

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

Segregation

The final destination of hazardous wastes will be considered before storage. If future recovery may be possible, storage of the material will allow for such recovery.

Ventilation

Hazardous wastes may present a serious health hazard in storage and will therefore be well ventilated. Volatile materials in particular will be considered. Since sealift containers do not accommodate proper ventilation, the site operator will ventilate the storage container before entering.

Ventilation will consist of opening the access doors one hour prior to entering. An observer will be present upon entering to ensure that the operator is not overcome by fumes. The observer must have access to communication in the event of an emergency.

Climate/Environment

Contact between hazardous wastes and rainwater and soil will be prevented, and wastes should not be exposed to direct sunlight. For outside storage of hazardous wastes, containers will be covered by a tarpaulin and placed on an impermeable base. This will also facilitate and reduce the cost of clean-up for any spills or leaks. The containment area will be curbed and diked to collect spills, leaks and precipitation.

Handling

Handling of hazardous wastes will be in accordance with WHMIS guidelines. The site operator will obtain WHMIS information for materials accepted at the site. The Transportation of Dangerous Goods Regulations will be followed when transporting the wastes off site.

Security

Security precautions will be taken to avoid theft, accidental discharge, and any possible harm to the public. The gate to the hazardous waste storage area will be locked at all times except when the operator is working in the hazardous waste area. Sealift containers will be closed and locked when access is not required.

Record Keeping

A record of the types and quantities of hazardous wastes must be maintained in a log book to ensure safe storage. Containers must be properly labeled during the entire time in storage. If this is not carefully completed then there could be problems identifying the waste when it is time to ship it south for disposal.

Record keeping will also include ongoing quantity totals and dates received. Since relatively small quantities of materials are expected to be delivered to the site, individual lists for each material will be worthwhile.

As a minimum record keeping should include the following:

- Type of waste received
- Quantity received
- Dates received
- Name of person/company who disposed the waste if available
- Method of storage/disposal
- On-going total quantity for each type of waste

Emergency Response Plan

An emergency response plan has been developed in case of a significant spill, fire, or other emergency (See Appendix I). The depot will also be equipped with an emergency spill kit and fire suppression equipment.

8.3.1.4 Transport and Disposal

Hazardous waste collected and stored by the City will be shipped to a receiver or hazardous waste management facility located outside of Nunavut. As per the Department of Environment, Government of Nunavut *Environmental Guideline for the General Management of Hazardous Waste*:

- Hazardous waste will only be shipped to a receiver or facility that has been registered in the receiving province or territory to accept that waste
- Waste manifests will accompany each shipment of waste in accordance with the Transport Authorities' requirements and in compliance with the Interprovincial Movement of Hazardous Waste Regulations
- The Landfill Foreman will work with the carrier to ensure that any hazardous waste shipped is packaged, documented, labeled and placarded in compliance with the method of transport used

- The Landfill Foreman will receive all documentation stating that the Hazardous Waste has been received by a registered facility (manifest)

8.4 Sewage Sludge

Dewatered sewage sludge from the Waste Water Treatment Plant is accepted for direct disposal into the active working face. Prior to delivery of the sludge a small “disposal pit” shall be prepared at the active working face. A load of waste from one of the commercial City waste collection trucks shall be dumped close to the area prepared for the sludge. Once the sludge is dumped it shall be immediately covered with the reserved waste load. The Waste Water Treatment Plant must call ahead and make prior arrangements with the Landfill to allow the Landfill adequate time to make necessary preparations for the acceptance of the sludge. Arrangements for sludge acceptance should not be early in the morning and ideally would occur later in the day and prior to the last waste collection truck arriving at the Landfill.

8.5 End of Life Vehicles

The New Hampshire Department of Environmental Services identified a number of best practices with respect to dismantling end-of-life vehicles, including:

- Prior to removing parts and dismantling vehicle components, completely drain all vehicle fluids, including antifreeze, brake fluids, engine oils, transmission fluids, windshield washer fluid, power steering fluid, rear axle housing fluids, etc. Do this over an impervious surface.
- Do not mix the fluids. Recycle, reuse, or dispose of fluids in an appropriate manner.
- Dismantle and drain vehicles, parts, scrap, and cores in one centralized location that is under a roof and over an impervious surface (for example, concrete). Make sure there are no open drains or cracks in the surface.
- Use drip pans when unclipping hoses, unscrewing filters and removing parts.
- Replace drain plugs when done draining.
- Fully drain parts and cores on a drain table or drip rack before moving them to a storage area.
- Keep spill control equipment nearby. Clean up spills immediately.
- Seal all fluid lines after draining to prevent leaks. Metal lines can be crimped or bent; rubber hoses can be plugged with clamps, balls, or golf tees.
- Remove and separate recyclable and potentially hazardous components, including the fuel tank, radiator, tires, battery, catalytic converter, air bag units, and mercury switches.
- Remove and capture air conditioning refrigerants (R-12 and R-134a). Qualified persons, using certified equipment, must perform this work.
- Remove engines through the hood. Do not tip vehicles on their sides, because this allows fluids to run out and spill on the ground.
- Establish a good routine for dismantling vehicles and stick with it.
- At “you-pull-it” facilities (where customers are allowed to remove parts), make sure the flu-ids are drained from vehicles before customers are allowed to remove parts. Instruct customers on proper procedures to prevent leaks during removal of parts, and provide spill control supplies for convenient customer use.
- Store engines, transmissions, and other oily, greasy parts off the ground, over an impervious surface, and under cover to prevent soil, groundwater, and storm water contamination. Have spill controls, including drip pans and absorbents handy.
- Keep an inventory of the vehicles and parts stored at the facility. 1

[1] New Hampshire Department of Environmental Services. N.H. Green Yards BMP Guide Sheet #11. May 2003.

In Canada, the Automotive Recyclers of Canada recently prepared the *National Code of Practice for Automotive Recyclers Participating in the National Vehicle Recycling Program* for Environment Canada[2]. The document describes the environmental considerations of related to managing end-of-life vehicles and reviews the national code of practice for reuse and resale, administration, spills, dealing with hazardous materials, automotive recycler processing areas, and equipment and infrastructure. The document is available for download at www.certifiedautorecycler.ca/rescources.html.

As noted previously, the document *End-of-Life Vehicle Hazardous Materials Recovery Program Manual Operation* (2011) prepared for the DOE may be used as a reference for End of Life Vehicles operational procedures. It is available on the DOE's website at http://env.gov.nu.ca/sites/default/files/final_-_elv_program_manual_-_jan_10_2011_0.pdf.

8.6 Burn Box Operation

The Landfill utilizes an Airburners S-220 Refractory Walled Air Curtain Burner with a Kubota V2403-TE Diesel Engine to burn cardboard. Cardboard can be burned when conditions allow and the S-220 burner is to be operated according to the Operating Manual provided in Appendix K. The burn box is generally used to burn baled cardboard. **The burn box cannot be used when the wind speed exceeds 30 kilometers per hour (km/h).** The site operating procedures, read in conjunction with the Operating Manual, are as follows.

1. Engine Start
   - Perform pre start checks - Oil, coolant, fuel and air filter
   - Check weather to ensure the winds are blowing under the 30 kilometres per hour limit
   - Ensure that the power take-off clutch lever is disengaged.
   - If needed, turn key switch counter clockwise to the PREHEAT position for a few seconds
   - warm up the engine at idle 1000RPm for 5 to 10 mins
2. Cold lighting
   - Load box with dry material if possible
   - Spray 5-10 gallons of diesel fuel
   - Using propane torch light the material from under the rear doors and from the access door in the forward panel on the manifold side of the unit
   - Start fan when there is a good flame
   - Engage fan clutch after turning RPMs to 1400 (engage clutch handle slowly until it locks in place)
3. Hot lighting
   - Load box with dry material if possible
   - Wait until there is good flame then start fan (if not too hot can assist by using torch)
   - Engage fan clutch after turning RPMs to 1400 (engage clutch handle slowly until it locks in place)
4. Loading box
   - Using either bucket or grapple place material in box
   - Place material gently into box -avoid dumping material
   - Alternate ends to avoid overloading
   - Never overload box load to only 1/2 to 3/4
   - Loading slowly will burn faster than loading large quantities
5. Shut down
   - Stop loading 1 to 2 hours prior to end of shift
   - DO NOT stop fan when flames are closer than 24" from manifold

[2] Automotive Recyclers of Canada. National Code of Practice for Automotive Recyclers Participating in the National Vehicle Recycling Program. March 2010.

- If there is still significant material in box leave the fan engaged for the night at 1400 RPM
- If material is almost gone reduce RPMs to 1400 and disengage PTO
- Allow engine to cool off then shut down

6. Cleaning
    - Open back doors and check temps
    - If they are over 100C the rake must be used and pull material out
    - If pulling out change over to bucket to clear pile by back doors
    - If temps are cooler then can unload using the bucket and material piled to the side of box

8.7 General Guide

A general guide for the handling of various waste materials is provided in Table 3.0. This guide is only intended for reference; specific circumstances may dictate handling requirements and procedures.

Table 3: General Guide to Waste Handling

GENERAL GUIDE TO WASTE HANDLING			
Type of Waste	**Examples**	**Special Concerns**	**Handling Procedures**
Asbestos	Insulation, coated pipes	• Airborne particles post a health risk to landfill employees and customers	• DO NOT ACCEPT asbestos for disposal • Refer to site policies and Guidelines for the General Management of Hazardous Waste in NWT for acceptance and handling of asbestos
Bulk Liquids (except for select sump waste)	Oils, sump liquids, industrial liquids	• Bulk liquids are prohibited from disposal	• Do not accept liquid wastes for disposal
Bulky Metals	Appliances, culverts, sheets, equipment parts	• Consumes landfill space • Recyclable materials • Difficult to incorporate into working face • Appliances may contain CFCs	• Divert to metal storage area for recycling • Apply Ozone Depleting Substances Management Policy
CFC's	Refrigerators, Freezers	• Contains CFC's	• Remove cfc's and store for shipping • Move white goods to recycle area
Clean Fill	Uncontaminated soil	• Suitable for cover material on the landfill	• Divert to soil stockpile at working face for use as cover material
Combustibles	Carbide, metal dust, hot lime	• Combustible with water and air • Risk to site employees and customers	• Apply hazardous waste acceptance procedure • Separate from other waste and cover with soil
Compressed Gas Canisters	Propane bottles/tanks, industrial canisters, CFC canisters	• May be hazardous • May contain CFCs • May be dangerous to site employees and customers	• Do not accept for disposal if containers hold any contents • Do not compact • Store for recycling if appropriate
Construction and Demolition Wastes (Inerts)	Concrete, rocks, wood, glass, metals, asphalt, plastics	• Bulky materials may be difficult to spread and compact • Consumes landfill space • May contain hazardous wastes such as asbestos	• Dispose mixed inert loads in landfill operating area • Where practical, divert asphalt to a storage area for reuse

GENERAL GUIDE TO WASTE HANDLING			
Type of Waste	**Examples**	**Special Concerns**	**Handling Procedures**
Electronic Waste	Televisions, radio, computers	• N/A	• Store separately in shipping containers • Ship south for recycling when practical
Empty Containers	45 gallon drums, 20 litre pails, etc.	• May contain prohibited wastes (liquids, hazardous products) • May burst upon compaction and pose danger to site employees or customers • Some “empty” containers may be still classed as hazardous wastes unless properly cleaned	• Apply contaminated solids acceptance procedures • Do not accept containers unless contents are known to be non-hazardous solids • Do not compact sealed containers • Determine original contents of the containers • Look at container labels for original contents or warnings
End of Life Vehicles	Hazardous waste e.g. fluids such as gasoline and oil.	• Proper handling of hazardous materials	• Adhere to proper handling procedures outlined in this manual
Explosives	shells, dynamite	• Prohibited from landfills • May indicate criminal activities • High risk to site employees and customers	• Do not accept • If unloaded, isolate the area from site employees and customers • Contact RCMP
Fire Place or Barbecue Ash	Ash	• Easily airborne • If hot ashes exist, may ignite fires when unloaded	• Accept with caution • Do not unload directly on the working face • Unload away from working face or other burnable items and only unload onto soil • Ensure there are no hot coals present before incorporating onto the working face
Fluorescent Light Bulbs	Light bulbs	• Contains mercury • Can break easily	• Store in a secure location (garage) • Put fluorescent light bulbs through the Bulb Eater • Store contained mercury for shipping • Broken glass can be added to the municipal waste pile
Household Hazardous Waste	Paints, solvents, oils, cleansers, pesticides, etc.	• Public is encouraged to separate HHW from municipal waste stream • HHW is to be dropped off at the landfill by the Public	• HHW has to be stored in a shipping container • Ship south for proper disposal or recycling

GENERAL GUIDE TO WASTE HANDLING			
Type of Waste	**Examples**	**Special Concerns**	**Handling Procedures**
Industrial Solids	Powders, shavings, granules, sands, or dry chemicals	• Dust is easily airborne • May pose health risks to site employees and customers • May be abrasive or corrosive to equipment • May have hazardous properties	• The facility does not accept industrial waste
Land Clearing Debris	Soil, rocks, roots, , vegetation	• May be difficult to incorporate with refuse if it contains large solid materials • Primarily clean soils (i.e. with limited vegetation) may be suitable as cover material	• Determine if suitable for cover material if material is suitable as cover material, direct it to soil stockpile at working face for use as cover material • If material is unsuitable as cover material, dispose of it as inert waste
Lead Acid Batteries	Automobile, truck, and equipment batteries	• Wet cell batteries contain acids • Contain lead • May spark upon compaction and ignite fires	• Store on wooden pallets in recycling compounds • Place batteries into battery bags for shipment south to recyclers • Provide secure storage using a sea Can • Store as per Transportation of Dangerous Goods
Mattresses	Mattresses, box springs	• Difficult to handle in working face • Box springs may bind up in equipment	• Dismantle mattresses • Place steel springs into scrap metal storage area and remaining material can be disposed of at the working face.
Municipal Solid Waste (MSW)	Household refuse, commercial refuse including paper, food wastes, yard wastes, metals, plastics, glass, and other refuse	• Bulky items may bridge over other wastes thereby reducing compaction • Potential for odours and attraction of vectors • Potential for blowing litter	• Spread in thin layers on the working face and compact • Apply cover material
Organic Waste	Household organic waste, gardening residue, soil	• Potentially compostable material	• Place in working face

GENERAL GUIDE TO WASTE HANDLING			
Type of Waste	**Examples**	**Special Concerns**	**Handling Procedures**
Paint and Paint Cans		• Paint cans may not be empty • Paint may not be dry	• If paint cans are empty and dry, direct to working face for landfilling • Paint cans that are not empty and/or that contain wet pain must be placed in the shipping container and shipped south for recycling • May solidify paint by drying or adding cement powder before landfilling
Sewage Sludge	Municipal Sewage Sludge from the Wastewater Treatment Plant	• Heavy metals	• Treatment plant should make prior arrangements for disposal at the end of the day • Prior to arranged delivery time prepare a location in the working face for disposal, set aside a waste collection truck load of waste • Sludge to be placed in the prepared disposal area and immediately covered with the waste that was set aside.
Used Oil (incl. filters, oil containers)	Engine and transmission oil	• Liquid waste • Possibly flammable	direct customers to used oil drop facility
Used Tires	Passenger car and small truck tires (15 inch or less), medium truck (up to 19 inch), OTR tires (large equipment tires)	• Bulky and consume landfill space • Tires do not tend to stay buried but work their way to top of disposed waste material	• All tires accepted • Tires are not to be disposed of at the working face • Tires to be immediately loaded into a shipping container • When shipping container filled arrange for shipment south to recycler
Wood Waste	scrap lumber	• Difficult to incorporate into general refuse • Consumes landfill space • Divert treated wood to construction and demolition material area	• Incorporate into the working face • Wood waste can be crushed with the compactor and mixed with soil material and used as cover material

9. Operational Procedures

9.1 Operating Principles

The Landfill is to be operated by the following principles:

- Appropriate staff are on-site during operations hours
- Access to the Landfill is controlled
- Only approved or authorized waste is accepted for storage or disposal
- The Landfill is developed according to the engineering plans and fill plans
- Wastes are compacted to the greatest practical density
- Wastes are covered as necessary to control nuisances
- Surface water is managed and controlled within the requirements of the City's Water License
- Safe operating practices are followed and all Landfill personnel are encouraged to improve their skills and knowledge
- Records are maintained with respect to operations activities and site development
- Landfill operations are managed by a Landfill Operator

9.2 Landfill Staging

Refer to the fill plans and Landfill Decommissioning Plan for detailed Landfill staging and fill sequencing.

9.3 Traffic Control

9.3.1 Signage

Signs should be posted throughout the Landfill to inform and provide directions to customers for the appropriate locations for unloading. See the following table for recommended signs and placement.

Table 4: Recommended Signs and Placement

Location	Purpose	Type
At Highway	Direction Board	Permanent
At Gate	Name of Site; Operating Hours; Emergency Numbers; Safety Notices; Prohibited Waste	Permanent
Waste Oil Storage	Accepted Products	Permanent
Tire Storage	Sign boards for passenger tires, truck tires, and off road tires	Portable
Metal Storage	Acceptable Metals	Permanent
Working Face	Direction Signs; Safety Signs	Portable
Access Roads	Direction Signs; Speed Signs	Permanent
Battery Storage	Sign Board	Permanent
E-Waste: monitors, TV, computers, etc.	Sign Board	Permanent
White Goods: refrigerators, stoves, dishwasher, etc.	Sign Board	Permanent

9.3.2 Traffic Control at the Entrance

The Landfill Foreman should provide directions to Landfill customers upon entrance to the Landfill. Directions should include:

- General directions to the proper location for unloading vehicles
- To follow direction signs to the appropriate location
- To follow the instructions of operating staff
- Any special instructions that apply to the particular load carried

All loads of waste delivered by self-haul customers are to be inspected and the waste screening form completed.

All City waste collection trucks are to be log in using the Waste Truck Load Record form.

9.3.3 Traffic Control at the Working Face

During hours of operation, it may be necessary to direct traffic at the working face. When directing traffic, the Landfill Operator should:

- Always ensure his/her own personal safety when directing traffic
- Always face the movement of traffic
- Coordinate the flow of traffic to the working face including holding vehicles at a “staging” area until space is available for unloading
- Direct vehicles to an area where it is safe to unload
- Direct vehicles to areas where landfill equipment is not operating (at least 3 metres separation from operating equipment)
- Direct trailer units into an area where they have room to manoeuvre into position, without jack-knifing, for dumping
- Direct customers with hand signals, when appropriate, for safety reasons
- Encourage customers to unload quickly and in a safe manner to allow access to other site users
- Direct vehicles that will take more time to unload to an area where they will not interfere with other vehicles and will not cause delays to other customers

9.4 Tipping Fees

Rates are outlined by the Solid Waste Bylaw (see Appendix G).

9.5 Disposal Area and Working Face

The municipal solid waste disposal area is the largest area at the Landfill. Residential, restaurant, institutional, commercial and construction wastes are placed here. The site is surrounded by drainage ditches which contains runoff on-site until the run-off is pumped to the off-site retention pond. This area is also surrounded by berms and fencing to minimize windblown debris.

Part of the disposal area is working face area and is defined as the active portion of the Landfill where wastes are disposed of by spreading and compacting with landfill equipment. The Landfill is designed and constructed using the area fill concept. The working face shall be kept to a minimum. A narrow daily disposal area will help reduce litter and cover material (mulch of wood, furniture, mattresses and plastic) use.

The width of the working face depends primarily on the traffic volume and should be wide enough to allow the day's maximum number of trucks to unload. Allow 4.5 to 5 metres (15 to 18 feet) per truck.

For efficient operations of compaction equipment, the working face should generally be constructed on a 25% (4H:1V) to 35% (3H:1V) slope. Typically, vehicles are to be unloaded at the bottom of the working face and waste is to be pushed up the slope.

Only one working face for municipal solid waste should be active at any one time, except where the Landfill Operator may designate additional working faces, as necessary, for the following reasons:

- Allow access during adverse weather (e.g. the active working face may become inaccessible)
- Manage higher-than-normal traffic volumes
- Provide adequate separation of commercial and public vehicles for safety purposes
- Ensure the safe handling of hazardous wastes

9.7 Waste Placement Procedures

The Landfill shall be developed in accordance with Landfill site development as provided by the fill plans which are updated on a regular basis.

The working face area shall be compacted regularly to maximize density (thereby minimizing the disposal area), minimize cover requirements, and reduce bird attraction and odour. The compacted waste area is then covered with cover material to minimize the problems of odour, birds, and flies. Material cover also provides surface drainage from the finished surface, thereby reducing infiltration and subsequent leachate production.

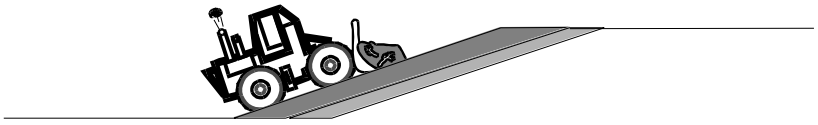
To monitor filling and monitoring airspace usage, the Landfill management should conduct topographic surveys to calculate the amount of airspace consumed, on an annual basis. The Landfill management may also conduct random audits throughout the year.

Compaction of solid waste is required to:

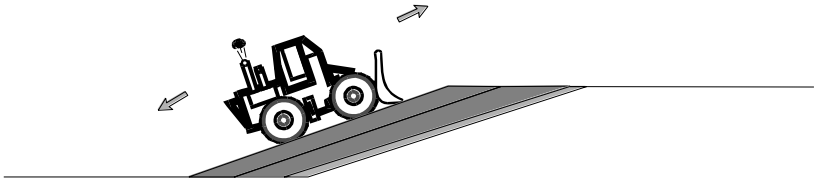
- Maximize waste density to optimize utilization of the Landfill airspace
- Minimize daily cover by providing an even surface on which cover is placed
- Reduce the potential for wind-blown litter

Figure 9-1 illustrates typical compaction procedures.

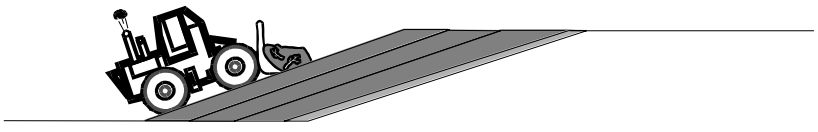
Figure 9-1: Compaction Procedures



SPREAD WASTE UPHILL IN THIN LAYERS (O.5 M)



COMPACT EACH LAYER WITH 3 - 5 PASSES



BUILD SUCCESSIVE LAYERS

Once compaction is complete, cover material should be placed to cover the wastes on a regular basis. Cover the compacted waste with a minimum 150 mm of the cover material (mulch of wood, furniture,). Ideally cover waste once per month during the summer months. Due to frozen soil during winter months regular placement of cover soil is not practical, however the waste deposited during winter months should be covered as early in spring as practical. Each layer of solid waste and cover material will be sloped towards the collection ditches to allow drainage. A compaction and covering cycle is to be completed in the fall to prepare for the onset of winter.

Cover applications at the Landfill include:

- A cover once per month during the summer months
- Cover prior to winter freeze up and early in the spring
- A final cover when the Landfill is closed

9.8 Cover Material Management

Properly placed cover material at a landfill is important to a well-run landfill. Improperly placed cover material results in increased operational costs and in the needless loss of valuable airspace.

Factors that affect soil consumption include:

- Compaction of the wastes
- Thickness of cover material
- Surface of the wastes
- Working face and operating area dimension

10. Nuisance Management

10.1 Litter Control

The ***first level of litter control*** involves actions to monitor that loads on vehicles hauling to the site are secured to prevent waste from falling or blowing onto roads leading to the site.

The ***second level of control*** is applied at the working face by directing vehicles to sheltered areas where possible, and by compacting and covering wastes.

The ***third level of control*** is retrieving litter that accumulates in site fencing, along roads leading to the site, on the site, or on adjacent lands.

The Landfill Foreman is responsible for patrolling and either cleaning or arranging for cleaning of:

- The access road and road leading to the site
- On-site permanent and temporary roads
- The Landfill property
- Adjacent lands around the perimeter of the Landfill

Should any loads be “illegally” unloaded along roads leading to the site or at entrance gates or fence lines along the property, the waste load should be inspected for any identifying wastes (i.e. addressed envelopes, utility bills, etc.) and the City of Iqaluit Municipal Enforcement Officer should be contacted. This waste must be cleaned up immediately to comply with operating and approval requirements.

10.2 Dust

Dust is generated by:

- Traffic dust on access roads
- Unloaded powdery or fine grained wastes
- Soil blowing from stockpiles or soil cover

Dust blowing from wastes may be controlled by:

- Unloading in a sheltered area away from the public disposal areas
- Requiring the waste generator/hauler to moisten or wrap the waste prior to delivery to the Landfill
- Covering the waste with other waste or cover material as soon as possible after unloading

Traffic dust may be minimized by:

- Reducing vehicle speed limits on gravel roads
- Applying water or dust suppressant to gravel road surfaces in hot dry weather

Soil stockpiles should be maintained to prevent blowing soil.

10.3 Noise

The Landfill is located in an isolated location away from any residential development and off-site noise is not anticipated to be of concern. Noise caused by operating equipment and vehicles may affect employee hearing, therefore, employees must comply with hearing protection PPE requirements as per the City H&S policy .

10.4 Odours

Odour issues can result in public complaints, negative public perception of the landfill operations, and nuisances to those who are most affected. Odours are more common in warm weather, during temperature inversions, and with breezes that carry odours from the site.

Odours are caused by:

- Decomposition of organic wastes
- Disposal of waste products with strong odours (dead animals, sludges, etc.)
- Chemical reactions in the landfill
- Stagnant water

Odours may be controlled through:

- Applying intermediate soil cover with the advance of the working face
- Immediately covering any wastes that, by their nature, emit strong odours (cover either with soil or other wastes)
- Working with waste generators to reduce odours at the source
- Immediately correcting any runoff seepage that may develop

10.5 Animals

A fence has been constructed around the perimeter of the site. This fence should be inspected on a regular basis to determine if there has been any breach of the fence. Any breach of the perimeter fence should be reported and arrangements made to repair as soon as possible.

10.6 Animal and Insect Controls

Following are “best management” approaches to minimizing the potential of an animal and insect infestation:

- Eliminate areas of ponded water other than designated retention ponds (insects and animals require water)
- Maintain a small working face
- Continue compaction of wastes
- Apply intermediate cover as the working face advances
- Apply soil or alternative cover where wastes once per week during the summer months, or more frequently as required

Should the Landfill Operator notice any signs that may indicate a rodent infestation or bear activity, he/she shall take action immediately. If a rodent extermination program is necessary, expert advice should be consulted. In the event of bear issues, the Department of Environment Wildlife Office should be contacted at (867) 975 - 7780.

10.7 Fires

Fires are included as a nuisance because of issues with safety, air quality, property damage, and general nuisances to site employees, customers, and neighbours. Fires are caused by:

- Hot loads unloaded at the working face
- Chemical reactions with a particular type of waste
- Intentional ignition
- Smoking (cigarette butts tossed onto the working face)
- Flammable debris on hot parts of the landfill equipment
- Sparking from compacting wastes such as automobile batteries

Should a fire occur, procedures outlined in Section 16.2 – Fire Management, should be implemented.

11. Surface Water Management

In 2011, the City of Iqaluit retained an engineering consulting firm to complete a West 40 Landfill Drainage Management Review that discusses the collection of the run-off within the Landfill, different treatment options and discharge criteria that should be followed. Please see Appendix E for a copy of the report.

12. Landfill Leachate Management and Treatment

Leachate and surface water run-off from the Landfill is collected in a collection ditch/catchment pond that is constructed along the east and south perimeter of the Landfill in accordance with the surface water management plan developed in 2011. All run-off from the Landfill is to be diverted to this ditch/pond. On a regular basis the collected water is to be pumped from this collection ditch to the retention pond constructed on the west side of Akilliq Drive. The leachate is retained in this pond and on an as needed basis, once volume in the pond reaches capacity, The City contracts for the leachate to be treated.

In 2016 the City of Iqaluit submitted an amendment to the Nunavut Water Board an amendment to the licence to treat leachate generated at the Landfill. The details of this treatment process and related Spill Contingency Plan is provided in Appendix K.

13. Landfill Safety Plan

This section is to be read in conjunction with the City of Iqaluit safety requirements.

13.1 Introduction

Due to the nature of the facility, safety precautions should be taken by those personnel involved in the operation and maintenance of the Landfill. All personnel should be familiar and abide by the City of Iqaluit Occupation Health and Safety Program, which contains 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 and abide by the Nunavut Safety Act and Regulations.

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

- Water and puncture proof gloves, coveralls, and safety boots are to be worn at all times
- Eye Protection and hard hats are recommended
- Work clothes should not be worn home
- Hands are to be washed frequently, as a minimum after work and before eating
- An appropriate fire extinguisher and a No. 1 First Aid Kit should be available at the site operators buildings
- 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
- Only personnel trained to handle hazardous materials should do so

Management is responsible to maintain an effective health and safety program, and provide the equipment, materials and training necessary to promote safe work practices and environments.

Supervisors are 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.

13.2 Purpose

The City of Iqaluit Municipal Landfill Safety Plan is intended to:

- Provide guidance and instructions for Landfill Operator on safety-related matters
- Aid Landfill Operator in identifying potentially dangerous situations and taking appropriate action

The safety of site operating staff and the public is of prime importance at all times. Site employees shall not endanger themselves or others on the site. Employees are obligated to report unsafe practices and are empowered to notify other employees or site users acting in an unsafe manner. All accidents, injuries, or near misses are reported to the Landfill and the following steps are taken:

- Investigate the incident immediately
- Determine the cause
- Complete the accident/incident report
- Take immediate measures to correct the cause and prevent it from reoccurring
- Have a safety meeting with employees as soon as possible after the incident

13.3 Safety of Site Users

By the very nature of its business, a landfill can be a very busy place with continual movement of various types of vehicles. It is the Landfill Operator's responsibility to maintain the safety of the site users by informing users of the landfill rules and monitoring that the rules are conformed to. To protect the safety of site users, the following basic rules shall apply:

- Children, pets, and individuals not unloading waste must remain in vehicles
- Only adults are allowed to unload vehicles in areas as directed by Landfill Operator
- Wastes shall be unloaded to the rear of vehicles and not strewn about
- Smoking at the unloading area is not allowed - the site is non-smoking in all areas;
- No scavenging is allowed
- Users must leave unloading area immediately after unloading vehicles, unless advised to stay for inspection

To protect the safety of site users, the Landfill Operator shall:

- Control access to the site
- Inform users of the rules upon reporting to the office
- Post and maintain adequate directional signs
- Enforce the site speed limit
- Maintain an orderly site
- Immediately inform users of unsafe practices

13.4 Working Safely Around Public Vehicles

Important considerations for working around the public include:

- The actions of the public are unpredictable.
- Never stand/go/run behind vehicles. Keep the tipping area clear and level so vehicles can have easy access.
- Potentially dangerous loads may include lumber, pipe, brush, or other materials; when unloaded without care these could harm persons or vehicles. If possible, spot these loads for unloading in a separate area away from other landfill users. If space does not allow this, do not allow these loads to unload until the area is safely clear of any other users.
- Avoid pushing waste around the unloading vehicles.
- Keep the working area free of glass, pipe, wire, wood, and other debris that could cause tripping hazards, and/or foot puncture hazards.

13.5 Safe Equipment Operations

- Machines shall be operated only by individuals who are properly trained and fully understand the machine.
- Perform a pre-check walk-around every time you get on the equipment near the working face;
- Check breaking system.
- Always use seat belt.
- Clean windows and adjust mirrors for best vision.

- No machine shall be operated unless all safety devices are operational and in good repair, i.e. brakes, backup alarms, fire extinguishers, lights, horn, etc.
- Check site for unsafe operating conditions such as large bulky items that will cause equipment instability.
- Ensure area around the machine is clear before moving.
- Use stepping points and handholds when mounting and dismounting equipment.
- Do not crush sealed containers with unknown contents.
- Always use caution around site users who may not be aware of dangers.
- When parking the equipment always:
  - Park on a level surface.
  - Lower blades, buckets.
  - Move transmission lever to park.
  - Apply the parking break.

13.6 Personal Protective Equipment

Appropriate personal protective equipment (PPE) for Landfill site work includes the following:

- Approved safety boots.
- Coveralls.
- Gloves.
- Safety goggles.
- Earplugs (when around loud equipment).
- Safety vest.
- Dust masks (when in dusty surroundings).

Special safety equipment may be required for dealing with fires and other incidents.

13.7 Safety Supervision

Site safety at the Landfill is coordinated through the Landfill Operator. All operations are to be conducted with safety as a priority at all times.

The safety of site operating staff and the public is of prime importance at all times. Site employees shall not endanger themselves or others on the site. Employees are obligated to report unsafe practices and are empowered to notify other employees or site users acting in an unsafe manner. All **accidents, injuries,** or **near misses** are reported to the Landfill Foreman, the Director of Public Works and the City's Safety Officer, and the following steps are taken:

- Investigate the incident immediately.
- Find out the cause.
- Make a complete accident report.
- Take immediate measures to correct the cause and prevent it reoccurring.
- Have a safety meeting with employees as soon as possible after the incident.

Submit report to WSCC.

13.8 Landfill Accidents

Accidents

Accident frequency for landfills tends to be higher than for most other construction industries. This is generally due to the nature of the waste and the fact that garbage is unpredictable and potentially dangerous.

All accidents at the Landfill will be investigated and an Accident Report Form for the incident will be completed. Complete the form providing as many facts as possible; provide only the facts. Do not place blame or fault, and include the following information as required on the form:

- Who was involved?
- Which vehicles were involved?
- Were there any personal injuries?
- What property was damaged?
- Which agencies or individuals responded to the accident?
- Date, time, weather conditions, witnesses, and other pertinent information.

13.9 Landfill Emergencies

Landfill Emergencies should be dealt with according to the Landfill Emergency Response Plan (see Appendix I) which sets out appropriate procedures to address foreseeable emergencies. The key elements of this plan are:

1. What is the nature and severity of the emergency?
2. What is to be done?
3. Who does it?

The emergency response plan addresses the following items:

- Fires
- Accidents and Medical Emergencies
- Environmental and Operational Emergencies

During any landfill emergency, the press will likely become aware and cover the story. NOTE: Do not make any statement or comment to the press without approval of the Director of Public Works. The Director will be the only spokespersons for the City of Iqaluit Waste Management (Department of Public Works).

13.10 Personal Decontamination Procedures

In instances where workers accidentally come in contact with unknown substances, the following procedures are to be followed. As well the Landfill Foreman should fill out the Incident Report

Skin Contact

- Wash with water for approximately 15 minutes. See a physician if any sign of irritation occurs.

Eye Contact

- Flush eye(s) with a gentle stream of water for 15 minutes. See physician immediately.

Ingestion

- Contact emergency services immediately and provide them with as much information as possible about the product that was ingested. Do not induce vomiting unless instructed to do so.

Inhalation

- Remove person to fresh air. If discomfort persists, take victim to physician. Provide physician with as much information on the inhaled material as possible.

13.11 Contacts

This section provides a list of those individuals to be contacted under various conditions. NOTE: In all accidents that involve injuries and/or alcohol, call the RCMP.

If an accident occurs on-site, contact:

- Landfill Foreman
- Emergency and Protective Services of the City
- Department of Public Works
- Any employees which may be impacted
- Nearby employees who are trained to respond to this type of emergency

If there are injuries, contact:

- Iqaluit Emergency Services
- The RCMP (fatality)
- Landfill Foreman
- Superintendent

13.12 Telephone Numbers

- Emergency Services Dispatch/Ambulance/Fire Department: (867) 979-4422
- Fire Fighters (general): (867) 979-5650
- RCMP: (867) 979-1111
- Public Works Administration: (867) 979-5630
- Spill Line 24 hours
  - Tel: (867) 920-8130
  - Fax: (867) 873-6924
  - E-mail: spills@gov.nt.ca

14. Landfill Closure

14.1 Closure

When a new solid waste management facility is opened and this facility closes, it will be decommissioned according to the City of Iqaluit West 40 Landfill Decommissioning Plan (2014), see Appendix F. While the Landfill is still open, the final decommissioning plan should be considered as the Landfill is developed. As each area is completed, the perimeter slopes and surfaces are reclaimed. In this way the Landfill is closed and reclaimed progressively throughout the active landfill life.

15. Record Keeping and Reporting

Landfill management must establish and maintain an operating record and prepare required reports. Record keeping and reporting is an important part of landfill operations.

15.1 Daily Operator Log

The Landfill Foreman will maintain a record of daily operating activities. The log will be maintained in the Landfill site building/office and submitted to the Superintendent at the end of the month. Daily records include, but are not limited to:

- Weather conditions (i.e. precipitation, wind speed and direction, temperature)
- Operating staff on-site
- Equipment on-site
- Operations activities (waste placement, compaction, sorting, recycling, site clean-up, etc.)
- Monitoring (visual or measured)
- On-site issues encountered and response or corrective action taken

15.2 Load and Load Inspection Records

Load records are maintained at the site and kept on file at the Landfill Foreman's Office.

Local records generally include:

- Time and date of delivery
- Waste hauler or customer
- Volume of waste
- Type of waste
- Fees collected

15.3 Annual Report

The annual operations report will be prepared by the Superintendent and will include:

- A record of the amounts and types of wastes received, disposed, stored, or recycled at the Landfill
- Major incidents, and corrective actions taken, if applicable
- Locations of waste disposal
- Record of public complaints and response actions
- Annual environmental compliance audits
- Current operations and design plans
- As-built drawings and survey records
- Environmental monitoring results
- Spill Reports

The environmental annual report, which includes groundwater monitoring report, shall be submitted to the Engineering Department for inclusion in the Department’s annual report to the NWB. The annual operations report must meet the requirements prescribed in the City of Iqaluit Water License.

15.4 Engineering Reports

Engineering reports will be developed where new construction activities occur and will include:

- As-built drawings and records;
- Current design plans and reports; and
- Construction QA/QC procedures, results, and survey records.

All Engineering reports will be submitted to the NWB as per Water License requirements.

15.5 Corrective Action Report

In the event that a corrective action is undertaken, the corrective action shall be documented and maintained in the operating record. A corrective action report may include:

- A description of the problem;
- A description of activities and results; and
- A description of the monitoring and effectiveness of the corrective action.

15.6 Spill Reporting

In the event of a substance release, the Landfill Foreman shall immediately notify the Superintendent and the City's Spill Contingency Plan should be implemented (see Appendix J). The spill must be reported to the 24 – Hour Spill Report Line. The Foreman must call and fill out the spill response forms as provided by Nunavut Environment at the following web page: https://www.gov.nu.ca/environment/documents/spill. The NT-NU Spill Report is also provided in Appendix B.

15.7 Monitoring

The City of Iqaluit is required to provide monitoring at the West 40 Landfill as per The Type "A" Water Licence No. 3AM-IQA1626, Part I and Schedule I.

The landfill is to be monitored at three (3) locations:

- IQA-08: Discharge from the leachate discharge location in the landfill run-off detention pond/ditch
- IQA-08A: Station located up-gradient of the Landfill
- IQA-08B: Station located down gradient of the Landfill

A plan showing the monitoring locations is provided in Appendix L.

15.7.1.1 Monitoring Station IQA-08

Monitoring Station IQA-08 is located in the landfill run-off detention pond which is used to collect landfill on-site runoff. Any water collected in this pond is pumped on a regular basis, as required, to the storage and treatment ponds located across Akilliq Drive.

Testing of this water is to occur:

- Once prior to discharge to the storage and treatment ponds
- Once during discharge
- Once prior to discharge

The samples are to be collected mid-depth in the ponded water. Testing results are to be provided in the Annual Report. The following table provides the testing requirements.

Table 5: Water Testing Parameters

Test Group	Analytical Parameters	Units
Biological (B)	Biochemical Oxygen Demand	Mg/L
	Total and Fecal Coliform	CFU/100mL
Effluent (E)	Total Suspended Solids (TSS)	Mg/L
	Temperature (field)	^{0}C
	Conductivity (field and lab)	uS/cm
	pH (field and lab)	pH units
Nutrients (N)	Ammonia-N, Nitrate-N, Nitrite-N	mg N/L
	Total Phosphorus, Orthophosphate	Mg/L
ICP-Metals Scan (Total)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, PB, Li, Mn, Mo, Ni, Se, Sn, Ag, Sr, Tl, Ti, U, V, Zn, Hg	Mg/L
Flow (F)	Volume	M^3
Landfill Specific (LS)	Polychlorinated Biphenyls (PCBs)	Mg/L
	Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	

As per Licence Part E (4) the water within the pond is to meet the following criteria

Parameter	Maximum Average Concentration	Maximum Concentration of Any Grab Sample
Total Suspended Solids (TSS)	50.0 mg/L	100.0 mg/L
pH	Between 6 and 9	

15.7.1.2 Monitoring Stations IQA-08A and IQA-08B

Monitoring Station IQA-8A is located in the road ditch up stream of the landfill, and IQA-08B is in the road ditch downstream of the landfill. Water is to be sampled at these locations once per year, in the spring, when there is run-off flowing in the ditches.

Testing results are to be provided in the Annual Report. The following table provides the testing requirements.

Table 6: Water Testing Parameters

Table 15.2 Water Testing Parameters

Test Group	Analytical Parameters	Units
Biological (B)	Biochemical Oxygen Demand	Mg/L
	Total and Fecal Coliform	CFU/100mL
Effluent (E)	Total Suspended Solids (TSS)	Mg/L
	Temperature (field)	^{0}C
	Conductivity (field and lab)	uS/cm
	pH (field and lab)	pH units
Nutrients (N)	Ammonia-N, Nitrate-N, Nitrite-N	mg N/L
	Total Phosphorus, Orthophosphate	Mg/L
ICP-Metals Scan (Total)	Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, PB, Li, Mn, Mo, Ni, Se, Sn, Ag, Sr, Tl, Ti, U, V, Zn, Hg	Mg/L
Flow (F)	Volume (low estimated)	M^3
Landfill Specific (LS)	Polychlorinated Biphenyls (PCBs)	Mg/L
	Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	

15.8 Water License Reporting Requirements

The City's Water License has specific reporting requirements for the West 40 Landfill (see Appendix H for the Water Licence). This reporting includes:

- Water monitoring reports
- Emergency discharge reports
- Engineering design reports (for planned work) and as-built drawing (for completed work)
- Annual Operation and Maintenance Manual revisions
- Follow up on Water Inspector orders/directives
- Shipping of recyclables
- Shipping of hazardous waste
- Abandonment and restoration

15.9 Health and Safety Program Records

Health and Safety Program Records must be maintained as per the City's Health and Safety Program, the Nunavut Health and Safely Act and Regulations, and WSCC requirements. These include but are not limited to the following types of records:

- Daily vehicle/equipment inspections
- Safety meetings
- Incident reports (accidents/near misses)
- Site safety inspections
- Equipment maintenance

Appendix A

Polices

Contaminated Rags Policy
Automobile Batteries Policy

Key and Gate Lock Policy
Administrative Record Policy
Visitor Record Policy

Tipping Fees Policy

Prohibited Waste Policy

Wash Up Policy

Vehicle Accident Response Policy
Treated Wood Policy

Spill Contingency Policy

Ozone Depleting Substances Management Policy
Litter Control Policy

Last Man Out Policy
Key Policy

Hours of Operations Policy

Empty Container Policy

Fire Policy

Safe Work Policy

Random Load Checking Program Policy
Propane Bottle Policy

City of Iqaluit Health and Safety Program

City of Iqaluit Accident Investigation Program

CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Contaminated Rags Policy	**Page:** 1 of 1

PURPOSE:

To define acceptable procedures for acceptance and disposal of oily rags.

POLICY:

1. Contaminated rags generally means cloth materials that have been used in industrial applications for cleaning or spill cleanup purposes.
2. This policy does not apply to small quantities of rags that are normally deposited in waste receptacles at a household or business, but applies to large quantities that are generated as a result of a spill clean-up or that have been stored at an industry or business separately from the normal waste stream.
3. The waste generator must provide a full and complete description of the contaminant and include a waste analysis.
4. If the contaminated rags contain a prohibited waste (i.e. hazardous waste), then they must not be accepted at the landfill.

RESPONSIBILITIES:

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Automobile Batteries Policy	**Page:** 1 of 1

PURPOSE:

To establish the storage and management of automobile batteries for recycling.

POLICY:

1. Automobile and lead batteries will be accepted at the landfill from residents for recycling purposes.
2. Batteries will be placed at the hazardous wastes temporary storage area.
3. Batteries will not be accepted at the landfill from commercial businesses.
4. All efforts will be made to encourage landfill customers to separate batteries from other waste.
5. Batteries accepted for recycling will be stored:
   a. On wooden pallets placed over a lime pad;
   b. In a sheltered area; and
   c. Covered with a tarp or plastic or placed in a weather-proof structure.
6. Recycling of automobile batteries will be coordinated by the Superintendent in accordance with contractual agreements.

RESPONSIBILITIES:

.1 The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Key and Gate Lock Policy	**Page:** 1 of 1

PURPOSE:

To maintain control of access to the site after hours in order to minimize liabilities to the landfill.

POLICY:

1. Customers requesting access to the landfill outside of the established operating hours shall arrange for the time of access with the Landfill Foreman.
2. The Landfill Foreman shall be present at all times, when after hours access is provided, they will remain on-site until the customer has left the site.
3. Customers requesting after hours access shall pay an hourly rate of $ _____ to the Landfill Foreman for the period of time the employee is required at the site, with a minimum charge of 1 hour per entry, and shall pay the landfill tipping fee as set out in the Tipping Fees Policy.
4. The customer shall notify the Landfill Foreman at least **4 hours** in advance of requiring access to the site outside the established operating hours.

RESPONSIBILITIES:

1. The Landfill Foreman will be responsible for scheduling any after hour access times with the customer and shall maintain a record of the customer and time incurred.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Visitor Record Policy	**Page:** 1 of 1

PURPOSE:

To maintain a record of site visitors for site safety.

POLICY:

1. In this Policy "visitors" means those persons that are non-customers and may include:
   a. City employees and councillors;
   b. Consultants;
   c. Environmental Protection Service Inspector;
   d. NWB Officer;
   e. Scheduled tour groups; or
   f. Other non-customers.
2. All visitors will report to the Landfill Foreman at the landfill office and will sign a visitor registry that includes the person's name, time of entry, and purpose of the visit.
3. All visitors will report to the Landfill Foreman upon leaving the site and will initial and enter the time of departure on the visitor registry.
4. Prior to departure from the site, the Landfill Foreman will check the visitor registry to make sure all visitors have signed out.

RESPONSIBILITIES:

1. The Landfill Foreman will maintain the visitor registry.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Tipping Fees Policy	**Page:** 1 of 2

PURPOSE:

To establish tipping fees charged to commercial customers for use of the landfill.

POLICY:

City of Iqaluit shall establish the tipping fee.

RESPONSIBILITIES:

1. The Director of Public Works will be responsible to review tipping fees and recommend alternate tipping fees to the CAO.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Prohibited Waste Policy	**Page:** 1 of 1

PURPOSE:
To define waste that is prohibited from disposal at the landfill.

POLICY:

Prohibited waste is all substances and materials listed below:

- Any waste defined as “oilfield waste”;
- Biomedical waste that is not rendered inert;
- Radioactive waste;
- Combustible waste;
- Explosives; and
- Bulk liquids.

1. The Foreman reserves the right to determine if a waste is acceptable at the landfill for storage or disposal. The prohibited waste may include soils or materials containing non-hazardous materials, such as those containing high concentrations of chlorides or other such constituents.

RESPONSIBILITIES:

1. The Landfill Foreman shall be responsible to inspect loads for prohibited debris and to take necessary actions to prevent such waste from entering the landfill site.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Wash Up Policy	**Page:** 1 of 1

PURPOSE:

To establish appropriate hygiene for operations staff at the landfill.

POLICY:

Hands **MUST BE** thoroughly washed before handling or consuming **ANY FOOD OR BEVERAGE**. Food and beverage is to be consumed only in the Building, another area designated by the Landfill Foreman, or **OFF-SITE**.

Hands **MUST BE** thoroughly washed before **SMOKING**.

Hands must be thoroughly washed **BEFORE LEAVING** the landfill site for any reason, except in the case of an emergency when the site must be quickly evacuated.

Exterior clothing worn while working around any hazardous wastes, **MUST BE** removed prior to leaving the site.

RESPONSIBILITIES:

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Vehicle Accident Response Policy	**Page:** 1 of 1

PURPOSE:

To establish appropriate response in the event of a vehicle accident at the landfill site.

POLICIES:

All vehicle accidents should be reported and an investigation into the cause of the accident should be carried out. In the event of a vehicle accident, the following actions should be taken:

1. Alert the Landfill Foreman of the accident.
2. If the damage to the vehicle(s) is minor, the Landfill Foreman may instruct the individual(s) involved in the accident to report to the RCMP station.
3. If the damage is major, the Landfill Foreman is to call the RCMP.
4. Secure the site for safety and for follow-up investigation.
5. Traffic is to be directed around the scene of the accident.
6. If the vehicle accident results in any injuries, the injured person(s) should be provided with any assistance required as set out in the Medical Emergencies Response Policy.
7. Assist the RCMP with any investigation that is undertaken.
8. Complete the Incident Accident Form.

RESPONSIBILITIES:

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Treated Wood Policy	**Page:** 1 of 1

PURPOSE:

To outline acceptance and handling of treated lumber.

POLICY:

1. Treated lumber generally includes
   - Used railway ties;
   - Used power and telephone poles; or
   - Used fence posts.
2. Acceptance of treated lumber is to be done in accordance with the contaminated solid acceptance procedures outlined in the operations procedures manual.
3. Only non-processed (or whole units that have not been cut, shredded, or chipped) will be accepted for disposal.
4. Commercial volumes of treated lumber will not be accepted for disposal, whereby a commercial volume is more than five rail ties or five fence posts, and no more than one power pole or telephone pole.
5. Treated wood is not to be deliberately burned.

RESPONSIBILITIES:

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Spill Contingency Policy	**Page:** 1 of 1

PURPOSE:

To establish appropriate procedures to follow in the event of a spill that occurs on the landfill site including the active operations area, storage areas, compost facility, or in buildings or parking areas. This Spill Contingency Policy shall be reviewed annually and revised as necessary to reflect changes in regulations, operations, and technology. Any proposed revisions shall be submitted to the NWB for approval.

POLICY:

1. Immediately close off and isolate (with a barricade if appropriate) the area of the spill to the public and site employees who are not directly involved in the clean-up of the spill.
2. Identify, if possible, the material involved in the spill. If the material cannot be clearly identified, take note of the nature of the material (i.e. liquid or solid, colour, odour, original container, approximate amount, presence of vapours or fumes, or any other distinguishing features).
3. Direct traffic away from the spill area.
4. The Landfill Foreman shall coordinate the clean-up of the spill.
5. Control the source of the spill first then work on containing the spill using earth berms or other appropriate means.
6. For large spills, berm drainage ditches in the vicinity of the spill to prevent release of the material off-site.
7. Recover the spilled material and contaminated soils and deposit into an appropriate container for proper disposal. **DO NOT HANDLE CHEMICALS**.
8. Conduct personal decontamination if a chemical is spilled upon a person:
   - Remove and dispose of contaminated outer coveralls or personal clothing;
   - Utilize emergency eye wash and shower station if required;
   - Re-dress in cloth coveralls or a change of clothes that is kept on hand; and
   - If contaminated clothing cannot be washed safely, discard it.
9. If uncomfortable or hazardous fumes, bioinfectious, or radioactive materials are involved, follow evacuation procedures immediately and call Department of Public Works at (867)979-5653. Explain to the emergency operator the situation, identify the material (if possible) and provide as much information about the substance as possible such as liquid, solid, colour, quantity, or odours, and the location of the material on the site.
10. If outside fuel or oil storage tanks leak, contact a vacuum truck operator to vacuum up the free liquid product and use a spill kit to clean up any residue. Oil or fuel soaked soil should be excavated and properly handled through the biodegradation facility or other proper disposal.
11. Contact the Environmental Protection Division of the Department Environment, NU at (867) 975-7700.

RESPONSIBILITIES:

1. The Director of Public Works shall be responsible for the review and update of this policy.
2. The Landfill Foreman shall be responsible for carrying out spill containment in the active landfill operating area.
3. The Superintendent shall be responsible for advising Environmental Protection Division, as necessary.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Ozone Depleting Substances Management Policy	**Page:** 1 of 1

PURPOSE:

To prevent the uncontrolled release of Ozone Depleting Substances from appliances and equipment stored at the landfill.

POLICY:

1. In this policy, the term "units" applies to all household and commercial appliances and equipment that may contain Ozone Depleting Substances (i.e. CFC's) and may include refrigerators, freezers, and air conditioning equipment, and may also include automobile air conditioners.
2. All units will be inspected prior to acceptance for storage or disposal at the landfill, and only those units that are tagged by a qualified technician indicating that the CFC's have been purged, may be accepted for storage and recycling.
3. Units that are NOT tagged by a qualified technician indicating that the ozone depleting substances are not purged, the site supervisor may:
   a) Refer the customer to a qualified technician for purging of the ozone depleting substance and tagging of the unit; or
   b) May accept the unit for storage and assess a tipping fee in accordance with the rate set out by the Superintendent for all untagged units accepted for storage at the landfill.
4. All untagged units accepted for storage at the landfill will be stored in an area separate from tagged units and will not be crushed, recycled, or disposed until they are inspected and purged by a qualified technician in accordance with the Ozone Depleting Substances Regulations and appropriately tagged.
5. Units that have been improperly deposited at the working face or at other locations at the landfill will be separated and inspected for appropriate tags and moved and stored in the appropriate area. In all cases where an untagged unit is identified, attempts will be made to identify the customer and if identified, the appropriate fee will be assessed.

RESPONSIBILITIES:

1. The Landfill Foreman will be responsible for inspecting all units delivered to the site.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Litter Control Policy	**Page:** 1 of 1

PURPOSE:
To define litter control methods and responsibilities.

POLICY:

In summary, the following litter control methods are to be followed:

- All delivered loads should be secured;
- Compact waste as soon as practical after being deposited;
- Position wind catchment fences according to the location and configuration of the working face and wind direction;
- Retrieve litter as soon as practical following high wind events;
- Collect litter twice a year, once in the spring and once in the fall, as required in the Water Licence;
- Immediately clean up and, if safe to do so, dispose of in the landfill waste dumped illegally at the entrance gates or along access roads; and
- Regularly check ditches along adjacent roads and site access roads and pick up and dispose of spilled or blown litter as required.

RESPONSIBILITIES:

1. The Landfill Foreman is responsible for controlling and litter retrieval of litter escaping from the working face and cleanup of litter on the north side along roads.
2. The Landfill Foreman is responsible for litter control and cleanup of litter in the recycling compounds.
3. The Foreman is responsible for inspecting the landfill to monitor litter control and cleanup.
4. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Last Man Out Policy	**Page:** 1 of 1

PURPOSE:

To maintain site control and the safety of site employees, customers, and visitors.

POLICY:

1. At the end of the day closure of the landfill, a "last man out" procedure shall be followed. The Landfill Foreman shall:
   a. Remain at the site until all other employees, customers, and site visitors have left;
   b. Close and lock the entrance gates;
   c. Complete a complete drive through of the recycling compounds, working face, composting area, inert disposal area, and equipment area;
   d. Check all buildings to make sure no one remains inside and to make sure all doors and windows are closed and locked; and
   e. Check the working face and inert disposal area to make sure the area is secure and that no fires or other issues are present.

2. The Landfill Foreman shall check the visitor registry to make sure all visitors have signed out.

3. Every effort will be made to make sure that no unauthorized vehicles or individuals remain at the site after it is closed for the day.

RESPONSIBILITIES:

1. The Landfill Foreman will be responsible to carry out this policy.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Key Policy	**Page:** 1 of 1

PURPOSE:

To maintain control of key distribution for the City of Iqaluit Municipal Landfill

POLICY:

1. Keys for access to the landfill will be distributed to:
   - The Landfill Foreman, and
   - The Superintendent.

RESPONSIBILITIES:

1. The Superintendent will be responsible for controlling distribution and use of keys.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Hours of Operations Policy	**Page:** 1 of 1

PURPOSE:
To control public access to the landfill is limited to a specified period of time.

POLICY:

1. The landfill gates will only be open for public access during the hours of operations as set out in this policy.
2. The hours of operations are:

Tuesday to Saturday 08:00 – 12:00 P.M. and 1:00 P.M. - 5:00 P.M.

The Landfill is closed on the following holidays:

- New Year's Day;
- Good Friday;
- Easter Monday
- Toonik Tyme Day
- Nunavut Day;
- Victoria Day;
- Canada Day;
- Civic Holiday (First Monday in August);
- Labour Day;
- Thanksgiving;
- Remembrance Day;
- Christmas Day; and
- Boxing Day.

RESPONSIBILITIES:

1. The Landfill Foreman will be responsible for opening and closing landfill gate to the prescribed hours of operations.
2. The Director of Public Works will be responsible for the reviewing and updating this policy.
3. The hours of operations will only be set by the Superintendent.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Environmental Policy	**Page:** 1 of 1

PURPOSE:
To apply "best management" practices with regards to environmental protection.

POLICY:

1. The Director of Public Works will manage the landfill using due diligence towards development and operations of the landfill in accordance with regulatory requirements and best management principles.
2. Utilities and Environment employees and Contractors will endeavour to work according to the operating principles as set out in this policy.
3. "Due diligence" is defined as "the taking of all reasonable steps as part of the due care and attention to prevent the occurrence of an accident or mishap, as well as having a contingency plan to control an incident and limit any consequential damage". This includes: policy development, checking and corrective action, and management review.
4. Best management practices include:
   a. Good housekeeping;
   b. Preventative maintenance;
   c. Inspections and record keeping;
   d. Security;
   e. Employee hiring and training;
   f. Reporting of incidents;
   g. Operations procedures;
   h. Emergency response planning;
   i. Identification and assessment of risks; and
   j. Review and corrective action.

RESPONSIBILITIES:

1. The Superintendent will be responsible to conduct, or arrange for, routine inspections of the landfill, operating procedures, and records in regards to this policy
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Empty Container Policy	**Page:** 1 of 1

PURPOSE:
To provide direction to the Landfill Foreman for acceptance and management of empty containers.

POLICY:

1. Empty containers include:
   a. 45 gal drums;
   b. Grease and oil containers; and
   c. Other industrial containers.
2. Empty containers will only be accepted if:
   a. The top of the container has been removed; and
   b. The container has not been sealed.
3. Containers will not be accepted that:
   a. Are closed and sealed; and
   b. The container holds any liquids.
4. The waste generator or hauler must provide a description of the previous contents of the container and identify if the container has been properly rinsed in accordance with the Guidelines. The Landfill Foreman may refuse acceptance of any container if the previous contents are not known or if the container has not been properly cleaned.
5. Empty containers that are recyclable will be stored in appropriate storage areas.
6. Empty containers that are not recyclable may be disposed in the landfill.

RESPONSIBILITIES:

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Fire Policy	**Page:** 1 of 1

PURPOSE:

To set out emergency procedures for responding to a fire.

POLICY:

1. Upon discovery of fire at the landfill, the Landfill Foreman shall call:
   - The Fire Department at (867) 979-4422 immediately to report the fire, its location, and the materials that are burning.
   - The Landfill Foreman shall call the Superintendent immediately.
   - Contact adjacent property owners, particularly if it appears the fire will go off-site.
2. Remove all operating and non-operating persons to a safe location. All non-operating persons shall be escorted to the gates, and the entrance gates are to be closed.
3. Maintain access to the site for Emergency Vehicles throughout the duration of the emergency.
4. Clear the Fire area of all persons, vehicles, and equipment with due consideration to safety.
5. For small fires (i.e. little or no flame present and capable of being extinguished by a portable fire extinguisher), if safe to do so, isolate the burning material from other waste, then extinguish or otherwise contain the fire to one area.
6. If the fire is isolated from other wastes, the fire may be extinguished by either covering it with sand or other soils, or by dousing it with water and covering it with soils.
7. If safe to do so, move flammable materials and wastes away from the fire **OR** cover these materials with sand or other soils to minimize the potential for the fire to spread to these materials.
8. **Do not bury any fire into the working face under any circumstances.**
9. Upon arrival of emergency response vehicles (Fire Truck, Ambulance) the senior staff members, e.g. Landfill Foreman, on-site shall identify themselves to the Emergency Commander and offer full assistance as requested. Once the Fire Department arrives, the Fire Commander in is full control and landfill staff takes instructions from the Fire Commander.
10. The landfill operating staff are to remain at the site unless otherwise evacuated or released by the Fire Commander.
11. Following a fire, an incident report is to be completed and an investigation into the cause of the fire is to be conducted by the Solid Waste Manager.
12. Once the fire is extinguished and it is safe to do so, the waste and debris is to be cleaned up and the site operations returned to normal conditions.

RESPONSIBILITIES:

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Safe Work Policy	**Page:** 1 of 1

PURPOSE:

To protect employees from flying debris, dust, heat, noise, traffic, and other potential hazards.

POLICY:

1. Employees are to be aware of safe work practices and must know how and when to use personal protective equipment.
2. Employees working at the landfill shall wear appropriate personal protective equipment for specific duties undertaken and in accordance with specific circumstances such as windy conditions, high dust conditions, or other situations that may arise.
3. Personal Protective Equipment to be worn by employees in accordance with the above includes:
    a. Steel toed safety boots (for all field duties);
    b. Safety vest (in the field when out of vehicles or landfill equipment);
    g. Hard hat (where appropriate to specific duties);
    h. Eye protection (in high wind or dusty conditions);
    i. Ear protection (when operating or working around equipment);
    j. Long pants and shirts (for all field duties); and
    k. Hat (in hot weather).
4. In the event of dirt or dust in eyes, the eye wash station at the scale house is to be used with assistance from the Landfill Foreman, if required. **If there is any doubt about debris in the eyes (i.e. metals, glass, or other materials) immediately see a Doctor.**
5. All near misses and accidents must be reported and documented on the Accident and Incident Report Form.

RESPONSIBILITIES:

1. All employees must take responsibility for their own safety and the safety of other employees, customers, and visiting pubic.
2. The Landfill Foreman shall provide input into the Policy and is responsible for enforcing the Policy.
3. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Random Load Checking Program Policy	**Page:** 1 of 2

PURPOSE:

1. To randomly inspect loads of waste being disposed at the landfill;
2. To detect hazardous or other prohibited waste material and avoid their disposal in the landfill; and
3. To identify potentially recyclable material which could be diverted from the landfill in the future.

POLICY:

1. Randomly select a load for inspection and ask the driver to stop in a designated area.
2. Record the following information on a Waste Inspection Form prior to allowing the driver to dump the load (see Waste Inspection Form):
    - Name of hauler;
    - Name of waste generator;
    - Type of waste;
    - License plate number;
    - Truck number;
    - Name of the driver; and
    - Signature of the driver.
3. Ask the driver to dump the load in the designated area. The driver is not required to stay on-site while the load is being inspected.
4. Spread out the waste, using a rake or front-end loader if required.
5. Record any potentially recyclable materials.
6. Inspect the load for hazardous or prohibited waste materials. If such materials are found, then do the following:
    - Isolate the waste and contact the Landfill Foreman if the waste material poses an immediate risk to human health or the environment;
    - Record the information on the Waste Inspection Form;
    - Take photographs of the material;
    - Attempt to confirm information on the generator of the waste;
    - Contact the hauler or generator of the waste material and require them to remove the material from the Landfill Facility;
    - If the waste materials are considered hazardous, contact the Environmental Protection Division Department of Environment at (867) 975-7700.
7. Complete and sign the Waste Inspection Form.
8. Send a letter to the generators of the recyclable materials advising that the material could be recycled in the future.

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Random Load Checking Program Policy	**Page:** 2 of 2

RESPONSIBILITIES:

Record Keeping

1. A Waste Inspection Form will be completed for each load inspected and will be kept on file at the landfill and administrative offices.
2. If hazardous waste materials are identified, the Waste Inspection Form and a summary of the action taken will be forwarded to NWB, and the Environmental Protection Division Department of Environment.
3. Photographs of hazardous waste materials will be filed with the appropriate Waste Inspection Form.

Safety Considerations

1. The Waste Inspector will wear the following safety clothing during inspections:
   - Coveralls;
   - Safety boots;
   - Gloves;
   - Safety vest;
   - Face mask as required; and
   - Eye protection.

Inspection Frequency

1. One in every 300 loads, a minimum of two loads per month will be inspected.
2. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

CITY OF CITY OF IQALUIT

	Policy No.
Facility: City of Iqaluit Municipal Landfill	**Effective Date:**
Policy: Propane Bottle Policy	**Page:** 1 of 1

PURPOSE:

To provide guidance for the acceptance and handling of propane bottles.

POLICY:

1. Propane bottles will not be accepted at the landfill unless the container has been purged or emptied of its contents and the operating valve is in an open position, or if it has been removed from the bottle.
2. If the operating valve is closed, the propane bottle will not be accepted.
3. Empty propane bottles will be stored in the designated propane bottle storage area.
4. Propane bottles will not be offered, given, or sold to any person for use, unless that person is qualified to refurbish and certify the propane bottle.
5. All valves will be removed from propane bottles for recycling.
6. Empty propane bottles with removed valves will be recycled through scrap metal dealers if possible, but will otherwise be disposed in the landfill.

RESPONSIBILITIES:

1. The Director of Public Works will be responsible for reviewing and updating this policy.

Approved By:	Date Approved:
Approved By:	Date Approved:

Iqaluit	Health and Safety Program		HSP
	Title		
	Approved By:	CAO	
	Date Approved:	3 Nov 2011	
	Date JWHSC Approved:	15 Nov 2011	Annual Review
	Revision Date:		

1. Purpose

1.1. The purpose of this program is to prevent injury/harm to all workers and citizens of the City of Iqaluit by implementing proactive inspections, hazard identification, accident investigations and a Joint Work Site Health & Safety Committee. It will also aid in reducing the accidental damage to equipment and materials used in the daily operation of our City. The goal of this program is to meet or exceed governmental legislation, recognized industry standards and work practices while working to serve the citizens of Iqaluit.

2. Scope

2.1. This program pertains to all workers of the City of Iqaluit, including visitors, contractors and sub-contractors.

3. Procedures

3.1. This program will be developed by management in conjunction with the Joint Work Site Health and Safety Committee, to meet the City of Iqaluit's Health and Safety Policy. There will be 13 main programs established to meet the Nunavut Safety Act and Regulations. These programs are:

3.1.1. Health and Safety Program - HSP
3.1.2. Health and Safety Orientation - HSO
3.1.3. Health and Safety Education & Training - HSET
3.1.4. Joint Work Site Health and Safety Committee - JWHSC
3.1.5. Workplace Inspections - WI
3.1.6. Accident Investigations - AI
3.1.7. Emergency Response Plan - ERP
3.1.8. Personal Protective Equipment - PPE
3.1.9. Prevention Maintenance Program – PMP
3.1.10. Safe Work Practices – SWP
3.1.11. High Risk Tasks - HRT
3.1.12. Health and Safety Program Audit – HSPA
3.1.13. Return to Work Program - RTW

3.2. To support these programs Safe Work Practices SWP will be developed by management again with consultation by the Joint Work Site Health and Safety Committee to define task specific responsibilities by department.

4. Roles & Responsibilities

4.1. CAO

4.1.1. Establish the City of Iqaluit Health and Safety Policy
4.1.2. Support all Programs established by departments

4.2. Directors

4.2.1. Ensure compliance with approved Prevention Programs
4.2.2. Monitor compliance through regular inspections of the workplace
4.2.3. Conduct requirements of Section 4.3 should there be no direct Manager/Supervisor in the Department
4.2.4. Discipline infractions of non-compliance

4.3. Managers/Supervisors

4.3.1. Know all Prevention Programs
4.3.2. Comply with all Prevention Program requirements
4.3.3. Train employees on the Prevention Programs
4.3.4. Develop SWP's to support the Program
4.3.5. Inspect the workplace monthly
4.3.6. Conduct a Job Hazard Analyses to control hazards
4.3.7. Discipline infractions of non-compliance
4.3.8. Recommend changes to the Programs

4.4. Workers

4.4.1. Participate in the Prevention Programs
4.4.2. Identify hazards to managers/supervisors
4.4.3. Work in accordance with legislative and city requirements
4.4.4. Recommend changes to the Programs

4.5. JWHSC

4.5.1. Review the Prevention Programs annually
4.5.2. Monitor effectiveness of Programs through inspections
4.5.3. Identify areas of improvement
4.5.4. Recommend changes to the Programs

4.6. Health & Safety Officer

4.6.1. Audit the Prevention Programs
4.6.2. Provide assistance developing SWP's
4.6.3. Provide assistance developing Job Hazard Analysis
4.6.4. Monitor legislative and industry standards to improve Programs

5. Communication

5.1. Directors shall communicate with Managers/Supervisor changes required to the Program.
5.2. Managers/Supervisors shall communicate changes of the Program to workers.
5.3. Workers shall communicate with Managers/Supervisors any required changes to the Program.

6. Training

6.1. All workers shall receive a City of Iqaluit Employee Orientation within the first 2 weeks of employment with the City of Iqaluit outlining Program areas.
6.2. All workers shall receive Departmental Orientation on work place specific Programs upon hire.
6.3. All workers shall receive training whenever new procedures/equipment has been introduced into the department.
6.4. All contractors and sub-contractors shall receive training on City of Iqaluit Programs as required.

7. Evaluation

7.1. Annually
- 7.1.1. Directors
- 7.1.2. Managers/Supervisors
- 7.1.3. JWHSC

7.2. Quarterly
- 7.2.1. Health and Safety Officer

8. Forms

8.1. As required throughout the City of Iqaluit Program.

9. Reference Material

9.1. Nunavut Safety Regulation Section 7

Iqaluit	Accident Investigation Program		AIP
	Title		
	Approved By:	CAO	
	Date Approved:	23 January 2012	
	Date JWHSC Approved:		Review
	Revision Date:		3 Years

1. Purpose

1.1. To meet legislative requirements of the Territory of Nunavut to report deaths, incidents and injuries within specified periods to the Chief Safety Officer of the WSCC.

1.2. To ensure that all incidents, injuries, near misses are reported, investigated and corrective action is taken to prevent the situation from occurring again.

2. Scope

2.1. The following incidents/injuries shall be investigated immediately by Directors/Managers/Supervisors upon notification by a worker.

2.1.1. Death

2.1.2. Incident of a Serious Nature

2.1.2.1. A major structural failure or collapse of a building, bridge, tower, crane, structure, scaffold, temporary construction support system or excavation;

2.1.2.2. An uncontrolled spill or escape of a toxic or hazardous substance;

2.1.2.3. An accidental contact with an energized electrical conductor;

2.1.2.4. A premature or accidental detonation of explosives;

2.1.2.5. A concussion, major blood loss, serious fracture, unconsciousness or amputation; and

2.1.2.6. An incident involving heavy equipment.

2.1.3. Incident Involving Non-Serious Injury

2.1.3.1. A work related injury where Medical Treatment or First Aid is required.

2.1.4. Incident with No Injury

2.1.4.1. An undesired event that under different circumstances could have resulted in an accident with injury, property damage, or loss of productivity.

3. Procedures

3.1. The following course of events is not implied to be sequential however are very important to ensure the integrity of the accident scene investigation.

3.2. **Death** – The goal of our Health and Safety Program is to avoid this circumstance at all cost. An accident causing death is a traumatic event for the worker witnessing it. First Aid and or Medical Treatment are always the first priority for the injured worker. Legal obligations after the injury may apply and therefore it is important to notify the supervisor of the accident.

3.3. Notify your supervisor. The supervisor shall then ensure all responsibilities listed in Parts 3.3.1 through 3.3.7 are completed.

3.3.1. Immediately inform the WSCC Chief Safety Officer.
3.3.2. An accident involving a motor vehicle shall be reported to the RCMP.
3.3.3. Secure the scene of the incident.
3.3.3.1. Avoid compromising the integrity of scene. This may be accomplished with barrier tape, posting workers around the scene to prevent entrance or other means necessary.
3.3.3.2. Identify potential witnesses and separate them if possible.
3.3.3.3. Contact Emergency Services (ambulance/paramedics).

3.3.4. Contact the following City of Iqaluit employees:
3.3.4.1. Chief Administration Officer(all media communication shall be disseminated through the CAO) ;
3.3.4.2. Director of Human Resources (for notification of family);
3.3.4.3. City Health and Safety Officer (shall communicate with WSCC/RCMP/Municipal Enforcement);
3.3.4.4. Joint Worksite Health and Safety Committee member; and
3.3.4.5. Department Director.

3.3.5. Conduct an Accident Investigation with assistance from the City Health and Safety Officer and Joint Worksite Health and Safety Committee.

3.3.6. Complete and submit within 3 days-WSCC Claim: Employer's Report of Fatal Injury Form.

3.3.7. Complete Accident Investigation Form AIPF-01

3.4. Incident Involving Serious Injury or Incident of a Serious Nature

3.4.1. Notify your supervisor.

3.4.2. The supervisor shall then ensure all responsibilities listed in Parts 3.4.3through 3.4.11 are completed.

3.4.3. Provide medical treatment to injured worker.

3.4.4. Provide or arrange transportation to a medical facility for an injured worker.

3.4.5. Within 24 hours submit written or oral report to the WSCC Chief Safety Officer.

3.4.6. Secure the scene of the incident.
- 3.4.6.1. Avoid compromising the integrity of scene. This may be accomplished with barrier tape, posting workers around the scene to prevent entrance or other means necessary.
- 3.4.6.2. Identify potential witnesses and separate them if possible.
- 3.4.6.3. Contact Emergency Services if required.

3.4.7. Contact the following City of Iqaluit employees:
- 3.4.7.1. Chief Administration Officer;
- 3.4.7.2. Director of Human Resources;
- 3.4.7.3. City Health and Safety Officer;
- 3.4.7.4. Joint Worksite Health and Safety Committee; and
- 3.4.7.5. Department Director.

3.4.8. Conduct an Accident Investigation with assistance from the City Health and Safety Officer.

3.4.9. Complete and submit within 3 days WSCC Claim: Employer's Report of Injury Form.

3.4.10. Provide the Worker with a WSCC Claim: Workers Report of Injury Form.

3.4.11. Complete Accident Investigation Form AIPF-01.

3.5. Incident Involving Non-Serious Injury

3.5.1. Notify your supervisor.

3.5.2. The supervisor shall then ensure all responsibilities listed in Parts 3.5.3through 3.5.12 are completed.

3.5.3. Worker shall inform Supervisor immediately of the Injury or Incident.

3.5.4. Provide medical treatment to injured worker.

3.5.5. Provide or arrange transportation to a medical facility for an injured worker.

3.5.6. Secure the scene of the incident.
- 3.5.6.1. Avoid compromising the integrity of scene. This may be accomplished with barrier tape, posting workers around the scene to prevent entrance or other means necessary.
- 3.5.6.2. Identify potential witnesses and separate them if possible.
- 3.5.6.3. Contact Emergency Services if required.

3.5.7. Contact the following City of Iqaluit employees:
- 3.5.7.1. City Health and Safety Officer;
- 3.5.7.2. Joint Worksite Health and Safety Committee; and
- 3.5.7.3. Department Director.

3.5.8. Conduct an Accident Investigation with assistance from the City Health and Safety Officer.

3.5.9. Complete and submit within 3 days WSCC Claim: Employer's Report of Injury Form.

3.5.10. Provide the Worker with a WSCC Claim: Workers Report of Injury Form.

3.5.11. Complete First Aid Record book with a First Aid Representative Signature.

3.5.12. Complete Accident Investigation Form AIPF-01 when Medical Treatment is required for the injury.

3.6. Incident with No Injury

3.6.1. Notify your supervisor.

3.6.2. The supervisor shall then ensure all responsibilities listed in Parts 3.6.3 through 3.6.6 are completed.

3.6.3. Worker shall inform Supervisor immediately of the Incident.

3.6.4. Contact the following City of Iqaluit employees:
- 3.6.4.1. City Health and Safety Officer;
- 3.6.4.2. Joint Worksite Health and Safety Committee; and
- 3.6.4.3. Department Director.

3.6.5. Conduct an Accident Investigation with assistance from the City Health and Safety Officer.

3.6.6. Complete Accident Investigation Form AIPF-01 when Incidents are assigned an Incident Rating of 1, 2 or 3.

4. Roles & Responsibilities

4.1. CAO

4.1.1. Establish the City of Iqaluit Accident Investigation Program.
4.1.2. Review annually the Accident Investigation Program.

4.2. Directors

4.2.1. Ensure investigations are conducted according to the Program.
4.2.2. Ensure corrective measures are implemented to prevent the incident/injury occurring again.
4.2.3. Ensure the WSCC Incident Reporting Responsibilities is posted in the workplace for all workers.
4.2.4. Ensure Managers/Supervisors are trained in Accident Investigation.
4.2.5. Conduct requirements of Section 4.3 should there be no direct Manager/Supervisor in the Department.
4.2.6. Encourage worker participation in the Accident Investigation Program.

4.3. Managers/Supervisors

4.3.1. Investigate all incidents/injuries reported by the worker.
4.3.2. Provide corrective measures to prevent the incident/injury occurring again.
4.3.3. Instruct all workers the importance of reporting incidents/injuries.
4.3.4. Complete all required Forms.
4.3.5. Encourage worker participation in the Accident Investigation Program.

4.4. Workers

4.4.1. Know the City of Iqaluit Accident Investigation Program.
4.4.2. Report all incidents and injuries to the Manager/Supervisor immediately.
4.4.3. Participate in investigations.

4.5. JWHSC

4.5.1. Know the Accident Investigation Program.
4.5.2. Receive training on Accident Investigation (Co-chairs).
4.5.3. Participate in Accident Investigations.
4.5.4. Review all Accident Reports.

4.6. Contractors/Visitors

4.6.1. Know the City of Iqaluit Accident Investigation Program.
4.6.2. Report all incidents and injuries to the Department Manager/Supervisor.
4.6.3. Participate in investigations.

4.7. Health and Safety Officer

4.7.1. Develop the Accident Investigation Program.
4.7.2. Provide training on Accident Investigation.
4.7.3. Assist with Accident Investigations.
4.7.4. Review all Accident Reports.
4.7.5. Report to CAO and JWHSC incidents/injuries monthly.

4.8. Training Development Officer

4.8.1. Coordinate training requirements for Directors.

5. Communication

5.1. The Accident Investigation Program shall be posted and available to all workers in the workplace.
5.2. All incidents/injuries shall be reported to the Health and Safety Officer.
5.3. Workers shall be informed of the Accident Investigation Program through the Orientation Program.
5.4. Workers shall report immediately any injury/incident to the Manager/Supervisor.

6. Training

6.1. Accident Investigation Program Training through the Orientation Program.
6.1.1. Directors
6.1.2. Managers/Supervisors
6.1.3. Workers
6.1.4. Contractors

6.2. Accident Investigation.
6.2.1. Directors

6.2.2. Managers/Supervisors
6.2.3. JWHSC Co-chairs

6.3. Refresher Training
6.3.1. Every 3 years
6.3.2. Change in the Accident Investigation Program.

7. Evaluation

7.1. Annually

7.1.1. Health and Safety Officer
7.1.2. Joint Worksite Health and Safety Committee

8. Forms

8.1. Accident Investigation Program Form AIPF-01
8.2. First Aid Log Book
8.3. WSCC Claim Employer's Report of Fatal Injury form
8.4. WSCC Claim Employer's Report of Injury form
8.5. WSCC Claim Worker's Report of Injury form

9. Reference Material

9.1. Nunavut Safety Regulation Sections 35 & 65.

Iqaluit	**Accident Investigation Program Form AIPF-01**	AIPF-01
	Title	
	Approved By:	
	Date Approved:	
	Date JWHSC Approved:	Review
	Revision Date:	3 Years

INFORMATION	***Department***				***File #***				***Report Date***			
	Location				***Date of Incident***				***Time***			
	Injury				**Damage**				**Near Miss**			
	Name				Property				Incident			
	Description of Injury				Damage Type				Cost			
	Occupation				Cost				Reported By			
	Job Experience				Estimated				Persons Involved			
					Actual				Supervisor			
	Incident Type (check)								**Contact (check)**			
	☐	Struck Against	☐	Caught On	☐	Fall on Same Level	☐	Electricity	☐	Caustics		
	☐	Struck By	☐	Caught Between	☐	Fall to Lower Level	☐	Heat	☐	Noise		
	☐	Caught In	☐	Slip	☐	Overexertion	☐	Cold	☐	Hazardous Substance		
	☐		☐		☐		☐	Radiation	☐			

RISK	**Incident Rating**			
	Severity		**Probability**	
	1	***Catastrophic*** – could cause death/major equipment loss	A	***Probable***-likely to occur soon (daily)
	2	***Critical*** – could cause severe injuries/equipment damage/environmental damage (time lost from work)	B	***Reasonable Probable***-likely to occur eventually (monthly)
	3	***Marginal***- minor injury/moderate damage/small environment impact (no time lost other than day of injury)	C	***Remote***-occur at some point (quarterly)
	4	***Negligible***- first aid treatment	D	***Extremely Remote***- unlikely to occur again (annual)
	This incident is rated as a (example-3D)			
	Any Incident Rating with a Severity Rating of 1, 2 or 3 must be investigated with the Health & Safety Officer.			

Iqaluit ᐃᖃᓗᐃᑦ	**Accident Investigation Program Form AIPF-01**		AIPF-01
	Title		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		Review
	Revision Date:		3 Years

Description of Incident/Statement of Observer (use back of form if required)		
Name	**Signature**	**Date**

Description of Incident/Statement of Observer (use back of form if required)		
Name	**Signature**	**Date**

Iqaluit	**Accident Investigation Program Form AIPF-01**		AIPF-01
	Title		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		Review
	Revision Date:		3 Years

INCIDENT CAUSES	***Substandard Act (check all that apply)***					
		Operating Equipment without Authority		Using Defective Equipment		Improper Lifting
		Failure to Warn		Improper Use of Equipment		Improper Position for Task
		Failure to Secure		Failure to use PPE		Servicing Equipment in Operation
		Operating at Improper Speed		Improper Loading		Horseplay
		Inoperable/Not using Safety Devices		Improper Placement		Under Influence Alcohol/Drugs
	Substandard Condition (check all that apply)					
		Operating Equipment without Authority		Inadequate Warning		Noise
		Improper Protective Equipment		Fire & Explosion Hazard		Radiation
		Defective Tools/Equip/Materials		Housekeeping		Temperature
		Congestion		Hazardous Environment		Lighting
						Ventilation
	Basic Causes (check all that apply)					
	Personal Factors					***Job Factors***
		Experience		Stress		Supervision/ Leadership
		Knowledge		Motivation		Engineering
		Training		Skill		Purchasing
						Maintenance
						Tools/Equipment
						Work Standards
						Wear and Tear
						Abuse and Misuse

Iqaluit ᐃᖃᓗᐃᑦ	**Accident Investigation Program Form AIPF-01**		AIPF-01
	Title		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		Review
	Revision Date:		3 Years

ANALYSIS OF CAUSES	***Expand on Incident Causes Identified on Page 3***

Iqaluit	**Accident Investigation Program Form AIPF-01**		AIPF-01
	Title		
	Approved By:		
	Date Approved:		
	Date JWHSC Approved:		Review
	Revision Date:		3 Years

	What must be done to prevent occurring again?	*Deadline*	*Whom*	*Completed*
CORRECTIVE ACTIONS				
	Investigators Signature	**Date**		

	Health & Safety Officer		
REVIEW			
	Signature	**Date**	

Appendix B

Forms

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: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR	REPORT NUMBER
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME	☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	____ - ____
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ 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	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	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 STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | 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			

Step 1: Fire Hazard Assessment Checklist		
Facility: _____		Date: _____, ____
Priority for Corrective Action	# 1 high risk #2 moderate risk #3 low risk #4 no risk #5 not applicable	

Item	Identified Hazard	Status (Priority)	Safety Hazard and Location
Fire Safety			
1	Employee training		
2	Employee knowledge		
3	On-site communications		
4	Off-site communications		
5	Water supply		
6	Site security		
7	Fire safety plan		
8	Fire drills		
Storage of Materials			
1	Compressed Gases		
2	Aerosols		
3	Dangerous goods		
5	6 m clearance of stored materials. From uncontrolled grass or weeds		
6	Fire Dept. access		
7	Fencing/Security		
8	Access to water		
9	Lumber storage		
10	Wood chips, hogged materials.		
11	Used Tire Storage		
12	Compressed gases		
13	Fire Dept. Access		
14	Fire breaks		

Step 2: Fire Safety Hazard Assessment Corrective Action				
Facility:			Date	
Assessment Team			Persons	Position
Item	Priority	Recommended Action	Follow-up: Action taken Date/Time	Follow-up: By whom?
Superintendent Signature:			Date:	

Step #3	**Health and Safety Hazard Assessment Checklist**		
Facility		Date/Time:	
Priority Status	#1 very hazardous, previous accident of high potential #2 hazardous with moderate risk #3 low risk #4 O.K. #5 not applicable (N/A)		
Item #	**Identified Hazards**	**Status/Priority**	**Safety Hazard and Location**
1	Housekeeping		
2	Material Storage		
3	Waste disposal		
4	Lighting		
5	Ventilation		
6	Extreme Temperature		
7	Radiation exposure		
8	Gas (toxic or non-life supporting)		
9	Flammables (Fire/Explosion)		
10	Dangerous Pressure		
11	Chemicals		
12	Hazardous Materials (WHMIS)		
13	High Risk Positioning		
14	Electrical Hazards		
15	Overhead Hazards		
16	Underground Hazards		
17	Confined Space Entry		
18	Excavations		
19	Restricted Access/Egress		

Step #3	**Health and Safety Hazard Assessment Checklist**		
Facility		Date/Time:	
Priority Status	#1 very hazardous, previous accident of high potential #2 hazardous with moderate risk #3 low risk #4 O.K. #5 not applicable (N/A)		
Item #	**Identified Hazards**	**Status/Priority**	**Safety Hazard and Location**
20	Ladders		
21	Work at Heights		
23	Work over water		
24	Major lifts (hoisting)		
25	Vehicles		
26	Mobile equipment		
27	High traffic		
28	Power tools		
29	Permits		
30	Communications		
31	First Aid		
32	Personal Protection Equipment		
33	Other items		
Superintendent Signature:			Date:

CITY OF CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL LANDFILL
ACCIDENT/NEAR MISS REPORT

Incident Date: _____ Time: _____

Location:
_____
_____

Name and Position of Person Making Report _____

Name of individual(s) involved:
_____
_____

Drivers License No.(s) if required _____

Individual or Company _____ Phone No. _____

Did the Incident Result in Personal Injury? Yes _____ No _____

Injury report attached Yes _____ No _____
(i.e. Worker's Safety and Compensation Commission form or other applicable form)

Did the incident cause damage to Landfill or other property? Yes _____ No _____

Who investigated the Incident?

Supervisor _____ RCMP _____ Special Committee _____ HS&S _____

Contact Person(s) _____

Details of Equipment/Property Damage if Applicable

Damage was to: Vehicle Equipment Property

Description:

Unit No. Year Make Model

_____

_____

_____

Estimated Value of Vehicle/Equipment/Property _____

Estimated Damage to Vehicle/Equipment/Property _____

Description of Incident (use attachment if necessary)

Incident Cause (use attachment if necessary)

Sketch of Incident Where Applicable (use attachment if necessary)

Recommendation to Prevent Re-occurrence (use attachment if necessary)

Comments (use attachment if necessary)

Name: _____ Signature: _____

Report Date _____

Distribution List:

CITY OF CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL LANDFILL
RANDOM LOAD VISUAL INSPECTION REPORT

Date: Time _____ a.m. /p.m.
Hauler _____
Vehicle Description _____
General Description of the Waste ____

Inspection Conducted by _____
Vehicle Operator _____
Source of the Waste _____
_____

Composition	Estimated Percent of Total Volume	Actions or Follow-up Taken
Food Waste		
Cardboard		
Paper Products		
Plastics		
Textiles/Rubber/Leather		
Metals		
Ceramics/Bricks		
Dirt and rocks		
Ashes		
Yard wastes		
Wood wastes		
Glass		
Tires		
Drywall		
Oils or greases		
Glycol		
Paints/Solvents		
Pesticides		
Cleaning Products		
Ozone Depleting Substances		
Electrical Equipment		
Radio-Active Materials		
Other (NOTE TYPE)		

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL LANDFILL
VISITOR LOG

Date	Name	Representing	Time In	Time Out	Signature	Reason for Visit

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL LANDFILL
MONTHLY SITE OPERATIONS INSPECTION

Date: _____ Inspector: _____

A: Acceptable, U: Unacceptable

No	Item	A	U	COMMENTS
1.0	**PERMITS AND APPROVALS**			
1.1	Municipal Development Permit			
1.2	Land Titles, Lease Agreements			
1.3	SAHTU Land and Water Board Approvals			
1.4	Other			
2.0	**RECORDS**			
2.1	Survey and Site Plans			
2.2	Waste Volumes			
2.3	Special Waste Records			
2.4	Daily Operating Logs			
2.5	Monitoring Reports			
3.0	**PERSONNEL TRAINING AND CERTIFICATION**			
3.1	Landfill Foreman			
3.2	First Aid			
3.3	Work Place Safety (OH&S)			
3.4	WHMIS			
3.5	Other			
4.0	**DESIGN AND OPERATIONS AND MAINTENANCE PLAN**			
4.1	Site Development Plan current			
4.2	Operations Procedures & Policies Current			
4.3	Construction/As-built records			
5.0	**PERSONNEL, OPERATING EQUIPMENT AND FACILITIES**			
5.1	Landfill Foreman			
5.2	Support Personnel			
5.3	Staff Facilities			
5.4	Equipment Facilities			
5.5	Communication equipment			
5.6	Fuel Storage			

No	Item	A	U	COMMENTS
6.0	**ENTRANCE AND ROADWAYS**			
6.1	Site Appearance			
6.2	Entrance Road			
6.3	On-site Access Roads			
6.4	Road Surfacing			
7.0	**SITE DEVELOPMENT**			
7.1	Construction			
7.2	Cover Soils			
7.3	Borrow Areas			
7.4	Topsoil/Subsoil Salvaged/Stockpiled			
8.0	**ACTIVE WORKING FACE**			
8.1	Vehicle Staging/Safety			
8.2	Working Face			
8.3	Waste Compaction Density			
8.4	Cover Frequency			
8.5	Surface Water Controls			
8.6	Litter Controls			
8.7	Other			
9.0	**INACTIVE SLOPES**			
9.1	Intermediate Cover (300 mm)			
9.2	Vegetation Cover			
9.3	Drainage and Grading			
9.4	Erosion Controls			
10.0	**COMPLETED AREAS**			
10.1	1000 mm Compacted Shale Layer			
10.2	150 mm Topsoil Layer			
11.0	**SURFACE WATER MANAGEMENT**			
11.1	Working face controls			

No	Item	A	U	COMMENTS
12.0	**ENVIRONMENTAL MONITORING AND CONTROLS**			
12.1	Groundwater Monitoring Annual Report on file Wells protected and secure			
12.2	Litter Management			
12.3	Animal Management			
12.4	Dust Management			
13.0	**CONTROLLED BURNING AREA**			
13.1	Materials accepted			
13.2	Site maintenance			
13.3	Burning controls			
13.4	Notification to Department of Environment and Natural Resources Northwest Territories, Neighbours, Fire Dept.			
14.0	**RECYCLING FACILITIES**			
14.1	Tires			
14.2	Metals			
14.3	Appliances			
14.4	Batteries			
14.5	Plastics			
15.0	**SAFETY**			
15.1	Employee Safety Practices/Issues			
15.2	Customer Safety Practices/Issues			
15.3	Equipment Backup Alarms			
15.4	Documentation			
16.0	**EMERGENCY RESPONSE**			
16.1	Medical Emergency Response			
16.2	Fire Response			
16.3	Environmental Response			

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL LANDFILL
DAILY OPERATIONS LOG

DATE: Day _____ Month _____ Year _____

WEATHER: Precipitation _____ mm Temp. _____ °C Wind : _____ km from _____

DAILY WASTE RECORD:

Received (in-bound) _____ m3
Recycled (out-bound) _____ m3
Compost Materials _____ m3
Clean Wood Materials _____ m3

STAFF:

Landfill Foreman Start: _____ Leave: _____

EQUIPMENT:

Compactor Hours: _____ Activity: _____
Hours: _____ Activity: _____

	Activities	Comments
SITE MAINTENANCE: (i.e. litter, fences, roads, other)		
CONTROLLED BURN:	Time start:	Time end:
SITE INSPECTIONS:	Observations	Action Taken or Required
Litter		
Surface Water		
Intermediate Cover		
Final Cover		
Compaction		

MONITORING:

Groundwater By _____ Record _____

SITE MAINTENANCE: _____

OTHER: _____
(Use back of form to note other activities.)

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL LANDFILL
WASTE SCREENING FORM

GENERAL INFORMATION

Date and Time:
Transporter Name:
License Plate No.:
Source of Waste:
Transporters Waste Description:

WASTE INSPECTION OBSERVATION (Completed by Landfill Personnel)

Observation	Yes or No	If yes, explain
Hazardous Waste Labels or Placards		
PCB Transformers, Labels or Placards		
Unrinsed Pesticide Containers		
Bulk or Containerized Liquids		
Free Liquids Present (i.e. oil)		
Sludges, Pastes or Slurries		
Powders, Dust, Smoke or Vapours		
Petroleum Odours		
Lead-Acid Batteries		
Unusual Odours		
Cylinders		
Paint		
Freon Items (fridge, freezer)		
Metal		
Wood (for the burn pile)		
E-Waste		
Other Suspicious Items		
Waste Accepted		

If waste was rejected, explain why: _____

What happened to rejected waste: _____

Signature of Landfill Personnel **Date**

CITY OF IQALUIT
CITY OF IQALUIT MUNICIPAL LANDFILL
HAZARDOUS MATERIAL LOAD CHECK FORM

Location _____

Date _____

Time _____

Vehicle Description & I.D. _____

Vehicle Operator _____

Waste Source _____

The following noteworthy items were found during this inspection:

Material Description	Container (i.e. Drum)	Quantity (i.e. kg/litre)	Remove to (Location)	Removed by (Name)

Comments and follow-up:

_____

_____

_____

Landfill Foreman's contacted: Time _____ Date _____

Name of person conducting inspection _____

Appendix C

Environmental Guideline for the General Management of Hazardous Waste

Environmental Guideline for the

General Management of Hazardous Waste

Department of Environment
Government of Nunavut

GUIDELINE: GENERAL MANAGEMENT OF HAZARDOUS WASTE

Original: April 1999
Revised: January 2002
April 2010
October 2010

This Guideline has been prepared by the Department of Environment's Environmental Protection Division and approved by the Minister of Environment under the authority of Section 2.2 of the *Environmental Protection Act.*

This Guideline is not an official statement of the law and is provided for guidance only. Its intent is to increase the awareness and understanding of the risks and hazards associated with hazardous waste and to assist in its proper management. This Guideline does not replace the need for the owner or person in charge, management or control of a hazardous waste to comply with all applicable legislation and to consult with Nunavut's Department of Environment, other regulatory authorities and qualified persons with expertise in the management of hazardous waste.

Copies of this Guideline are available upon request from:

Department of Environment
Government of Nunavut
P.O. Box 1000, Station 1360, Iqaluit, NU, X0A 0H0
Electronic version of the Guideline is available at http://env.gov.nu.ca/programareas/environmentprotection

Cover Photos: E. Paquin

Table of Contents

Appendices

Introduction

'Waste' is a term used to describe materials that are no longer wanted or are unusable for their original intended purpose. Many different types of waste are generated each day in Nunavut by industry and small business, hospitals and health centers, schools and individuals during the normal course of carrying out daily activities. Some types of waste pose greater risks than others because of their chemical, physical and biological properties. These wastes are generally referred to as being a 'hazardous waste'. Examples of hazardous waste include discarded paint, used solvents, motor and lubricating oil, cleaning compounds, certain building construction and demolition waste and products with an expired shelf life. They will generally exhibit one or more of the following characteristics - ignitable (i.e. flammable), reactive, corrosive or toxic. Hazardous waste often requires that specific management measures be taken to ensure the health and safety of the environment, workers and the general public.

The purpose of the Environmental Guideline for the General Management of Hazardous Waste (the Guideline) is to ensure the safe, effective and efficient management of hazardous waste in Nunavut. It provides information to generators, carriers and receivers of hazardous waste on its hazards, how best to reduce or eliminate the effects it can have on the environment, worker and public safety and guidance on its storage, registration and transportation.

The *Environmental Protection Act* enables the Government of Nunavut to implement measures that preserve, protect and enhance the quality of the environment. Section 2.2 of the *Act* provides the Minister with authority to develop, coordinate, and administer the Guideline.

The Guideline is not an official statement of the law. For further information and guidance, the owner or person in charge, management or control of a hazardous waste is encouraged to review all applicable legislation and consult the Department of Environment, other regulatory agencies or qualified persons with expertise in hazardous waste management.

1.1 Definitions

Carrier	A person who accepts hazardous waste for transportation or transports hazardous waste, whether or not for hire or reward. A carrier is also referred to as a transporter of hazardous waste.
Commercial	Actions undertaken for hire or reward.
Commissioner's Land	Lands that have been transferred by Order-in-Council to the Government of Nunavut. This includes roadways and land subject to block land transfers. Most Commissioner's Land is located within municipalities.
Consignee	A person to whom hazardous waste is being or is intended to be transported. A consignee is also referred to as a receiver of hazardous waste.

Consignor	A person who has possession of hazardous waste immediately before it is transported. A consignor may also be a generator of hazardous waste.
Contaminant	Any noise, heat, vibration or substance and includes such other substance as the Minister may prescribe that, where discharged into the environment, (a) endangers the health, safety or welfare of persons, (b) interferes or is likely to interfere with normal enjoyment of life or property, (c) endangers the health of animal life, or (d) causes or is likely to cause damage to plant life or to property.
Dangerous Good	Any product, substance or organism included by its nature or by the *Transportation of Dangerous Goods Regulations* in any of the classes listed in the Schedule provided in the *Transportation of Dangerous Goods Act* (Canada).
Empty Container	A container that previously held a hazardous waste and has been emptied to the greatest extent practical or triple rinsed with an appropriate cleaning agent. This does not include containers that previously contained mercury or Class 2.3, 5.1 or 6.1 materials.
Environment	Means the components of the Earth and includes (a) air, land and water, (b) all layers of the atmosphere, (c) all organic and inorganic matter and living organisms, and (d) the interacting natural systems that include components referred to in paragraphs (a) to (c) above.
Generator	The owner or person in charge, management or control of a hazardous waste at the time it is generated or a facility that generates a hazardous waste. A generator may also be a consignor of hazardous waste.
Hazardous Waste	A contaminant that is a dangerous good and is no longer wanted or is unusable for its original intended purpose and is intended for storage, recycling, treatment or disposal. A hazardous waste does not include a contaminant that is (a) household in origin; (b) exempted as a small quantity; (c) returned directly to a manufacturer or supplier of the product, substance or organism for reprocessing, repackaging or resale for any reason; (d) an empty container; or (e) intended for disposal in a landfill or a sewage treatment facility and meets the applicable standards set out in the Environmental Guideline for Industrial Waste Discharges.

Hazardous Waste Management Facility	A commercial facility used for the collection, storage, transfer, treatment, recycling or disposal of a hazardous waste. For clarity, a hazardous waste management facility does not include a municipal landfill or sewage lagoon.
Incompatible Hazardous Waste	A hazardous waste that, when in contact with another substance or hazardous waste under normal circumstances, reacts to produce heat, gas, fire, explosion or a corrosive or toxic substance.
Landfilling	The intentional depositing or placement of waste in or on land for the purposes of disposal.
Long-term Storage	The storage of hazardous waste for a period of 180 days or more.
Manifest	The manifest as set out in Schedule IX to the *Export and Import of Hazardous Waste and Hazardous Recyclables Regulations* under the *Canadian Environmental Protection Act* (Canada).
Minister	The Minister of Environment of the Government of Nunavut.
Qualified Person	A person who has an appropriate level of knowledge and experience in all relevant aspects of hazardous waste management.
Receiver	A person to whom hazardous waste is being or is intended to be transported. A receiver is also referred to as a consignee of hazardous waste.
Responsible Party	The owner or person in charge, management or control of the hazardous waste.
Small Quantity	Hazardous waste that is generated in an amount that is less than five kilograms per month if a solid or less than five litres per month if a liquid, and where the total quantity accumulated at any one time does not exceed five kilograms or five litres. This does not include hazardous waste that is mercury or Class 2.3, 5.1 or 6.1 materials. These wastes must be generated in an amount that is less than one kilogram per month if a solid or less than one litre per month if a liquid, and where the total quantity accumulated at any one time does not exceed one kilogram or one litre.
Transport Authority	The statute and regulations controlling the management of hazardous waste under that mode of transport. These include (a) Road and Rail - *Transportation of Dangerous Goods Act* (Canada) and *Regulations; Interprovincial Movement of Hazardous Waste Regulations* (CEPA) and *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations* (CEPA). (b) Air – *International Air Transport Association (IATA) Dangerous Goods Regulations* and *International Civil Aviation Organization* (ICAO) *Technical Instructions;* and

(c) Marine – *International Maritime Dangerous Goods Code* (IMDG).

Transfer	The temporary storage of hazardous waste for a period of 179 days or less for the purpose of changing from one vehicle or means of transportation to another.
Transporter	A person who accepts hazardous waste for transportation or transports hazardous waste, whether or not for hire or reward. A transporter is also referred to as a carrier of hazardous waste.
Waste Audit	An inventory or study of the amount and type of waste that is produced at a location.

1.2 Roles and Responsibilities

1.2.1 Environmental Protection Division

The Environmental Protection Division of the Department of Environment is the key environmental agency responsible for ensuring the proper management of hazardous waste and other contaminants on Commissioner's Land. Authority is derived from the *Environmental Protection Act*, which prohibits the discharge of contaminants to the environment and enables the Minister to undertake actions to ensure appropriate management measures are in place. Although programs and services are applied primarily to activities taking place on Commissioner's and municipal lands and to Government of Nunavut undertakings, the *Environmental Protection Act* may be applied to the whole of the territory where other controlling legislation, standards and guidelines do not exist. A complete listing of relevant legislation and guidelines can be obtained by contacting the Department of Environment or by visiting the web site at http://env.gov.nu.ca/programareas/environmentprotection.

The Department of Environment will provide advice and guidance on the proper management of hazardous waste. However, it remains the responsibility of the owner or person in charge, management or control of the hazardous waste to ensure compliance with all applicable statutes, regulations, standards, guidelines and local by-laws.

1.2.2 Generators of Hazardous Waste

The generator is the owner or person in charge, management or control of the hazardous waste at the time it is produced or of the facility that produces the hazardous waste. The generator is responsible for any and all hazardous waste produced and must ensure the hazardous waste is properly and safely managed from the time it is generated to its final disposal. This is referred to as managing the waste from cradle-to-grave.

Contractors may manage hazardous waste on behalf of the generator. However, the generator remains responsible for determining whether the waste is hazardous and ensuring the method of management complies with all applicable statutes, regulations, standards, guidelines and local by-laws. If the contractor does not comply with the requirements of the *Environmental Protection Act* and is charged with a violation while managing the waste, the generator may also be held liable.

The basic responsibilities of a hazardous waste generator in Nunavut are:

- Registering with the Department of Environment as a generator of hazardous waste.
- Registering the facility with the Department of Environment as a hazardous waste management facility where the facility is used for commercial purposes and is intended for the storage of hazardous waste for a period of 180 days or more, where stored quantities exceed the criteria set out in Appendix 8 or where hazardous waste is recycled, treated or disposed of in quantities in any single month that exceed a 'small quantity'.
- Classifying and labeling hazardous waste in accordance with the Transport Authority.
- Managing the hazardous waste in accordance with the Guideline, *Environmental Protection Act, Fire Prevention Act*, *Safety Act, Public Health Act* and all other applicable statutes, regulations, standards, guidelines and local by-laws.
- Reusing, recycling, treating or disposing of the hazardous waste in a proper and safe manner.
- Where the hazardous waste is transported off-site, completing Part A of the waste manifest form and retaining a copy for two years, using a registered hazardous waste carrier to transport the waste and sending the waste to a registered receiver or hazardous waste management facility.
- Ensuring staff are trained and qualified to safely handle the hazardous waste.
- Filing a spill contingency plan with the Minister where stored quantities of hazardous waste exceed the criteria set out in Schedule A of the *Spill Contingency Planning and Reporting Regulations*.
- Reporting any spill immediately to the NWT/Nunavut Spill Report Line at (867) 920-8130.

Further information and application forms for registering as a generator or a hazardous waste management facility are available from the Department of Environment. Refer to sections 3.2.1 and 3.2.2 and Appendices 4 and 7 for further information.

1.2.3 Carriers of Hazardous Waste

Hazardous waste must be transported in accordance with the appropriate Transport Authority: Road and Rail - *Transportation of Dangerous Goods Act* (Canada) and *Regulations, Interprovincial Movement of Hazardous Waste Regulations* (CEPA) and *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations* (CEPA)*;* Air – *International Air Transport Association (IATA) Dangerous Goods Regulations* and *International Civil Aviation Organization* (ICAO) *Technical Instructions;* and Marine – *International Maritime Dangerous Goods Code* (IMDG).

Carriers operating in Nunavut must be registered with the Department of Environment before transporting hazardous waste. Other basic responsibilities of hazardous waste carriers are:

- Placarding and labeling all transport vehicles and containers in accordance with the appropriate Transport Authority.
- Completing Part B of the waste manifest form and retaining a copy for two years.
- Accepting hazardous waste only from registered generators and safely transporting hazardous waste only to a registered receiver or hazardous waste management facility.
- Ensuring staff are trained and qualified to safely transport hazardous waste.
- Reporting any spill immediately to the NWT/Nunavut Spill Report Line at (867) 920-8130.

Further information and application forms for registering as a hazardous waste carrier are available from the Department of Environment. Refer to section 3.2.1 and Appendix 5 for further information.

1.2.4 Receivers of Hazardous Waste

Any person receiving or accepting hazardous waste in Nunavut for the purpose of storage, transfer, reuse, recycling, treatment or disposal must be registered with the Department of Environment as a hazardous waste receiver. The facility must also be registered as a hazardous waste management facility where it is used for commercial purposes and is used to store hazardous waste for a period of 180 days or more, store quantities that exceed the criteria set out in Appendix 8 or hazardous waste is recycled, treated or disposed of in quantities in any single month that exceed a 'small quantity'. Other basic responsibilities of hazardous waste receivers in Nunavut are:

- Handling and storing the hazardous waste in accordance with the Guideline, *Environmental Protection Act, Fire Prevention Act*, *Safety Act, Public Health Act* and all other applicable statutes, regulations, standards, guidelines and local by-laws.
- Reusing, recycling, treating or disposing of the hazardous waste in a proper and safe manner.
- Completing Part C of the waste manifest form and retaining a copy for two years.
- Accepting hazardous waste only from registered generators and carriers.
- Ensuring staff are trained and qualified to safely handle hazardous waste.
- Filing a spill contingency plan with the Minister where stored quantities of hazardous waste exceed the criteria set out in Schedule A of the *Spill Contingency Planning and Reporting Regulations*.
- Reporting any spill immediately to the NWT/Nunavut Spill Report Line at (867) 920-8130.

Further information and application forms for registering as a receiver or hazardous waste management facility are available from the Department of Environment. Refer to sections 3.2.1 and 3.2.2 and Appendices 6 and 7 for further information.

1.2.5 Other Regulatory Agencies

Other regulatory agencies may have to be consulted regarding the management of hazardous waste as there may be other environmental or public and worker health and safety issues to consider. Some of the other agencies include:

Department of Economic Development and Transportation

The Motor Vehicles Division is responsible for ensuring the safe transport of hazardous waste and other dangerous goods by road through administration of the *Transportation of Dangerous Goods Act*. The Department is also responsible under the *Motor Vehicles Act* for driver licensing and various other vehicle and load safety matters.

Workers' Safety and Compensation Commission

The Workers' Safety and Compensation Commission is responsible for promoting and regulating worker and workplace health and safety in Nunavut. The Commission derives its authority from the *Workers' Compensation Act* and *Safety Act* which require an employer to maintain a safe workplace and ensure the safety and well being of workers. The Workplace Hazardous Materials Information System, or WHMIS, requires information be provided to workers on the safe use of any hazardous material used in the workplace. All hazardous waste generators, carriers and receivers should consult the Prevention Services Division for further information and guidance.

Department of Community and Government Services

The Department of Community and Government Services is responsible under the *Commissioners' Lands Act* for the issuance of land leases, reserves, licenses and permits on Commissioner's Lands. The Department, in cooperation with communities, is also responsible for the planning and funding of municipal solid waste and sewage disposal facilities in most Nunavut communities. Emergency planning responsibilities under the *Emergency Measures Act* include developing territorial emergency response plans, coordinating emergency operations at the territorial and regional levels and supporting community emergency response operations.

The Office of the Fire Marshal is responsible for ensuring the safe storage, handling and use of flammable and combustible liquids and materials. The Office of the Fire Marshal derives its authority from the *Fire Prevention Act*, National Fire Code and National Building Code.

Department of Health and Social Services

Activities related to the generation, storage, transportation, treatment and disposal of hazardous waste may have an impact on public health. The Office of the Chief Medical Officer of Health and Regional Environmental Health Officers should be consulted regarding legislated requirements under the *Public Health Act.*

Environment Canada

Environment Canada is responsible under the *Canadian Environmental Protection Act* for ensuring the safe management of designated hazardous waste at federal facilities and on federal lands. The management, disposal and export of polychlorinated biphenyl (PCB) waste is controlled under the *PCB Regulations*, the *Federal Mobile PCB Treatment and Destruction Regulations* and the *PCB Waste Export Regulations*. The interprovincial and international transport of waste is controlled under the *Interprovincial Movement of Hazardous Waste Regulations* and the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*. Environment Canada is also responsible for administering the pollution prevention provisions of the federal *Fisheries Act*.

Indian and Northern Affairs Canada

Indian and Northern Affairs Canada is responsible under the *Territorial Lands Act* and *Nunavut Waters and Nunavut Surface Rights Tribunal Act* for the management of federal lands and waters in Nunavut, including the impact hazardous waste may have on the quality of these lands and waters.

Natural Resources Canada

The *Explosives Act* provides Natural Resources Canada with authority to manage explosives in Canada, including waste explosives. The Canadian Nuclear Safety Commission, which reports to Parliament through the Minister of Natural Resources, administers the safe handling and disposal of radioactive materials and licenses institutions and companies to possess and use radioactive materials under the *Nuclear Safety and Control Act* and *Nuclear Liability Act.*

Local Municipal Governments

The role of municipal governments is important in the proper local management of hazardous waste. Under the Nunavut Land Claim Agreement, municipalities are entitled to control their own municipal disposal sites. Hazardous waste may be deposited into municipal landfill sites and sewage treatment facilities only with the consent of the local government. Local environmental and safety standards are determined, in part, by how the property is designated under municipal government development plans (i.e. land use zoning). The local fire department may also be called upon if a fire or other public safety issue is identified.

Co-management Boards and Agencies

Co-management boards and agencies established under the Nunavut Land Claim Agreement have broad authority for land use planning, impact assessment and the administration of land and water. Activities involving hazardous waste may be controlled through the setting of terms and conditions in plans, licenses and permits issued by the Nunavut Water Board and other co-management boards and agencies.

Appendix 3 provides further assistance in determining the primary regulatory agency contact for managing hazardous waste in Nunavut.

Appendix 11 provides mailing addresses, phone and fax numbers for each of the regulatory agencies.

Management of Hazardous Waste

2.1 What is Hazardous Waste?

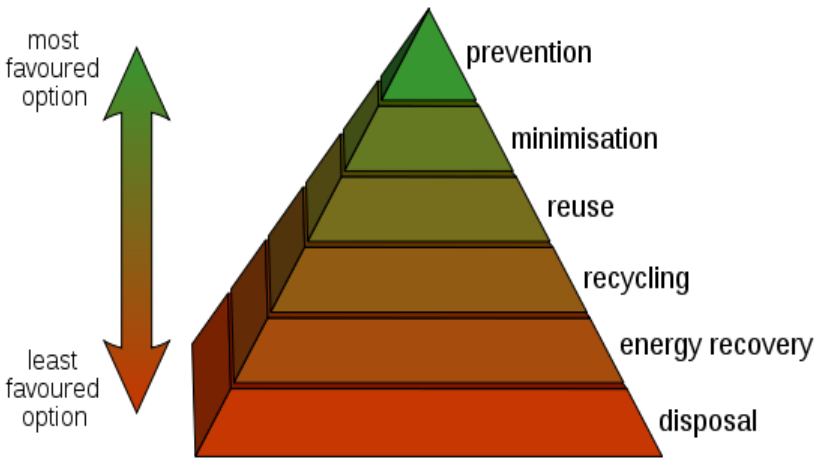
Hazardous waste is unwanted material or products that can cause illness or death to people, plants and animals. It may be a liquid, solid, sludge or gas and contain chemicals, heavy metals, radioactives, infectious organisms or other toxic substances. It may be a single product or a combination of many hazardous and non-hazardous materials (i.e. mixed waste). Its harmful effects may exist for a relatively short period of time (i.e. oil-based paint before hardening) or continue for hundreds of years. It can persist in soil, water and sediment (i.e. radioactive materials) or bioaccumulate in plants and animals (i.e. mercury, PCBs).

Hazardous waste is generated by everybody. Households commonly generate unwanted gasoline, brake and windshield wiper fluid, cleaning supplies, paints and paint thinners, lead acid batteries, used computer equipment and construction materials (i.e. asbestos), pesticides and others. Hospitals and nursing stations generate unwanted needles and waste human tissue, body fluids and biotic cultures. Business and industry generate many different types of hazardous waste including used motor and lubricating oil, cleaning solvent, drilling fluid and cuttings and mine tailings.

2.2 Waste Management

Proper waste management simply makes good sense. Minimizing or eliminating the generation of hazardous and other waste helps to reduce the hazards and costs associated with its handling, storage, transport, recycling, treatment and disposal. It also reduces the impacts waste could have on the environment, human and worker health and safety and reduces the global emission of greenhouse gases by minimizing the use of raw materials. Another term commonly used to describe activities that reduce the amount of material entering a waste stream or being released to the environment is ‘pollution prevention’.

Once a waste is created, the generator is responsible for its safe management from cradle-to-grave. Waste generators can prevent pollution and reduce costs by implementing various waste reduction, reuse and recycling programs through changes to operational procedures, maintenance practices and raw material use. Treating and disposing of waste either locally or outside of Nunavut should be considered only if reuse and recycling options are not available or practical.



2.2.1 Reduce and Minimize – the first option

Using raw materials efficiently and reducing the amount of waste generated is the first and most important step in effective waste management. Both environmentally and economically, consuming less is the most fundamental and effective step to reducing waste.

A waste audit should be undertaken to inventory and study the waste produced at a location or business. The audit should identify the type and amount of waste being generated, the costs of current management methods including handling, storage, treatment, transport and disposal, and examine opportunities and set targets for reducing or reusing waste. These opportunities include awareness and education, the substitution or reduction of purchased raw materials, production redesign, process changes and improved maintenance activities. Other opportunities include purchasing products that are durable or are manufactured from environmentally-friendly materials (i.e. biodegradable or post-consumer materials), avoiding products that are designed for single or short life usage and buying only the quantity that is needed. Effective communications is critical to the success of any waste reduction program.

2.2.2 Reuse and Recycle

Even with effective waste reduction measures in place there will be waste generated. Reusing the waste product for a different but related purpose (reuse) or producing a new product from the original material (recycle) is an effective way to reduce the volume of waste. The waste audit should identify whether opportunities are available for reusing or recycling waste within the generating facility. Alternatively, other local or distant users may be found to reuse or recycle the waste that would otherwise require treatment or disposal.

The Department of Environment encourages the reuse and recycling of hazardous and other waste in the following ways:

- Local reuse and recycle programs are available in various communities for some types of hazardous waste including used oil and waste fuel. Generators should contact the Department of Environment or local municipal government for the names of registered waste receivers or other opportunities to reuse or recycle wastes locally.
- Waste exchanges and associations offer opportunities for waste generators to transfer unwanted, overstocked, obsolete, damaged, contaminated and post-dated material to another person or company that can use it. In some cases, the receiving company will purchase the waste from the generator. Appendix 10 provides a listing of several waste exchanges and associations in Canada.

2.2.3 Treatment and Disposal in Nunavut

Treatment and disposal of a hazardous waste is the last step in effective waste management and should be undertaken only after all other practical reuse and recycle options have been examined.

Treatment covers a broad spectrum of activities. It includes any method, technique or process that will change the physical, chemical or biological character or composition of a hazardous waste so as to reduce its volume, neutralize or make the waste less hazardous and make it safer to transport or store

prior to its disposal. In some cases, more than one process may be required to treat the waste. Facilities in Nunavut at which hazardous waste is stored, treated, recycled or disposed of for commercial purposes must be registered as a hazardous waste management facility. The owner or operator of a facility should refer to section 3.2.2 and Appendix 7 for further information.

It is a contravention of the *Environmental Protection Act* for hazardous waste to be abandoned or disposed of on land or into water in Nunavut. Although a detailed discussion on specific hazardous waste disposal methods is beyond the scope of the Guideline, the following are general points for consideration:

- Hazardous waste must not be mixed or diluted with another substance, or divided into smaller quantities, simply to avoid meeting the definition of a hazardous waste.
- The generator is responsible for determining how hazardous waste can be safely disposed of and to comply with all applicable statutes, regulations, standards, guidelines and local by-laws. The Department of Environment will provide advice and guidance on the management of hazardous waste. Other sources of information and assistance include:
    - Manufacturer or distributor of the new product;
    - Manufacturer's Material Safety Data Sheets (MSDS); and
    - Waste exchanges and associations, other regulatory authorities, waste management consultants and other qualified persons with expertise in the management of hazardous waste.
- Hazardous waste that meets standards set out in the Environmental Guideline for Industrial Waste Discharges may be directed to municipal landfills and sewage treatment systems for disposal. The local municipal government must be consulted and consent to the use of their facility prior to the waste being disposed. Waste that does not meet the standards set out in the Environmental Guideline for Industrial Waste Discharges must be treated prior to disposal or transported to a facility that is registered to accept the waste.
- The open burning of hazardous waste is not an acceptable practice as toxic substances may be released into the atmosphere.
- Incompatible hazardous waste should not be mixed, combined or stored together in the same container as new hazards may be created. Combining or mixing one waste with another waste may also prevent its reuse or recycling and increase disposal costs.
- Containers that previously held a hazardous waste must be emptied to the greatest extent practical or triple rinsed with an appropriate cleaning agent prior to disposal. The rinsings must then also be managed according to their waste characteristics. Cleaned containers should be rendered unusable by puncturing or crushing prior to disposal to prevent their reuse. This is especially important for containers that could be reused for water or food storage.

The Department of Environment will consider alternate hazardous waste management and disposal measures that provide an equivalent level of environmental protection to those identified in this Guideline.

2.2.4 Treatment and Disposal Outside Nunavut

Hazardous waste can be sent to a receiver or hazardous waste management facility located outside of Nunavut only where the receiver or facility has been registered in the receiving province or territory to

accept that waste. The generator must comply with all applicable statutes, regulations, standards, guidelines and local by-laws of the receiving jurisdiction.

Within Canada, Environment Canada monitors and controls the interprovincial movement of hazardous waste under the *Interprovincial Movement of Hazardous Waste Regulations*. Waste manifests must accompany each shipment of waste in accordance with the Transport Authorities' requirements. Generators and carriers should refer to section 3.3 of the Guideline for additional information on transport and waste manifest requirements.

The international movement of hazardous waste is controlled under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Known simply as the Basel Convention, it is an international treaty to control and reduce the transfer of hazardous waste from developed to less developed countries. Environment Canada monitors and controls the international movement of hazardous waste under the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*.

A listing of Canadian waste management facilities may be obtained by contacting the waste exchanges and other organizations listed in Appendix 10.

General Requirements

Hazardous waste is classified using the system developed under the *Transportation of Dangerous Goods Act (Canada)*. Wastes are categorized into one of nine classes according to their chemical, physical or biological properties. Each waste, or group of similar wastes, is then identified using a specific 'UN' number assigned under the *Transportation of Dangerous Goods Regulations*. Refer to Appendix 2 for additional information on dangerous goods classifications.

3.1 Storage

Storage refers to containment of a hazardous waste for transport, or while awaiting treatment and disposal. Except under extraordinary circumstances (i.e. radioactive materials), storage should always be considered as a temporary measure and is not acceptable for the long-term management of hazardous waste.

Recognition of the incompatibility of different wastes during storage is important in order to avoid the possibility of violent, explosive reactions and toxic fumes. Various systems have been developed to ensure compatible storage including the 'Hazardous Waste Compatibility Chart' adopted by the United States' Environmental Protection Agency[1].

3.1.1 Containers

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

The following are additional general points for consideration:

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

[1] EPA-600/2-80-076 April 1980. A Method for Determining the Compatibility of Chemical Mixtures.

3.1.2 Facilities

A hazardous waste storage facility is a specially designed building or area that helps to ensure the safe and secure storage of hazardous waste. Detailed storage facility building designs are beyond the scope of the Guideline. The Department of Environment or other qualified person should be consulted prior to designing and constructing a storage facility.

The following are general points to consider when establishing a storage facility:

- The facility should meet all local and territorial siting and construction requirements and be readily accessible for fire fighting and other emergency responses. The local Fire Chief should be advised of the storage facility and its contents for emergency planning and response purposes.
- The facility should be secure. Access should be limited where practical to employees who have been trained in safety and emergency procedures. These procedures should be documented and a copy made available to those employees who have access to the facility.
- Inspections of the facility and stored wastes should be performed and recorded at least once every week.
- Containers should be placed so that each can readily and easily be inspected for signs of leakage, corrosion or deterioration. Leaking, corroded or deteriorated containers should immediately be removed and their contents transferred to a sound container.
- Records should be maintained indicating the type and quantity of waste being stored along with the date, type and quantity of hazardous waste brought into or removed from the facility.
- Drainage into and from the storage facility site should be controlled to prevent spills or leaks from leaving the site and to prevent run-off from entering the site.
- All waste should be stored on a firm working surface that is impervious to leaks.
- Incompatible waste must be stored in a manner that contact in the event of a spill or accidental release is not possible.
- Emergency response plans should be developed in cooperation with local emergency response personnel and emergency response equipment should be locally available in the event of a spill, fire or other emergency situation.

Where the facility is used for commercial purposes and is used to store hazardous waste for periods of 180 days or more or the quantity of waste stored on-site exceeds the criteria set out in Appendix 8, the facility must be registered with the Department of Environment as a hazardous waste management facility.

3.2 Registration

3.2.1 Hazardous Waste Generators, Carriers and Receivers

Generators, carriers and receivers of hazardous waste must be registered before undertaking activities involving these wastes. Completion of the approved form and submission of accurate information enables the Department of Environment to quickly complete the registration process. Registration enables the government to track the generation, transport and disposal of hazardous waste in Nunavut. It also provides assurance that the company has the necessary emergency response and spill

contingency plans in place should an accident or other incident occur involving a hazardous waste. Upon registration, the applicant will be assigned a unique identification number. This number is required in order to complete the waste manifest form.

Appendices 4, 5 and 6 provide samples of registration forms required for generators, carriers and receivers to apply for registration in Nunavut. Original forms and users' guides are available from Nunavut's Department of Environment or by downloading through the department's web site. Incomplete applications will result in delays in completing the registration process.

Generators and receivers of hazardous waste located in Nunavut must be registered with the Department of Environment. Carriers may be registered either in Nunavut or in the province or territory in which the company is based.

3.2.2 Hazardous Waste Management Facilities

A hazardous waste management facility is a facility or specially-designated area that is used for the collection, storage, transfer, treatment, recycling or disposal of hazardous waste for commercial purposes. Where the facility is used solely for the collection, storage or transfer of hazardous waste, the facility must be registered where waste is stored for a period of 180 days or more or the quantities exceed those set out in Appendix 8 of the Guideline. Where the facility is to be used for the treatment, recycling or disposal of hazardous waste, the facility must be registered where the quantity treated, recycled or disposed of in any single month exceeds a 'small quantity'.

The collection, storage, transfer, treatment, recycling or disposal of hazardous waste on behalf of a third-party does not remove the obligation of the owner or operator of a hazardous waste management facility to register the facility.

Appendix 7 includes a sample of the registration form required for the owner or operator of a hazardous waste management facility to apply for registration of the facility. The owner or operator may obtain an original form and users' guide by contacting Nunavut's Department of Environment or by downloading through the department's web site. Incomplete applications will result in delays in completing the registration process.

Registration of a hazardous waste management facility does not remove the obligation to comply with all other applicable municipal, territorial and federal statutes, regulations, standards, guidelines and by-laws. Guidance on planning for and achieving territorial environmental requirements for new industrial projects may be found in the *Environmental Guideline for Industrial Projects on Commissioner's Lands.*

3.3 Transportation

Carriers must ensure hazardous waste is packaged, documented, labeled and placarded in compliance with the method of transport used - road, rail, air or marine. A completed waste manifest must accompany each shipment of hazardous waste. Completion of the manifest together with proper marking and placarding of containers and vehicles enables police, ambulance, fire and other first responders to react effectively and safely in the event of a spill or other accident involving hazardous waste while in transit.

The transport of hazardous waste by road in Canada is controlled under the territorial and federal *Transportation of Dangerous Goods Acts* and the federal *Interprovincial Movement of Hazardous Waste Regulations* and *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations.* These Acts and Regulations require that personnel are trained, containers and transport vehicles are labeled and placarded and a completed waste manifest accompanies each shipment. The generator, carrier and receiver must each complete their portion of the manifest form and provide copies to the Department of Environment at various stages in the transport process. Refer to Appendix 9 for a copy of the manifest. Original manifest forms are available from Nunavut's Department of Environment and completion instructions are included on the reverse side of each manifest. Further assistance in completing a waste manifest may be obtained by referring to the *User's Guide for the Hazardous Waste Manifest* produced by Environment Canada or by contacting the Motor Vehicles Division of the Department of Economic Development and Transportation.

The International Air Transport Association (IATA) requires that all shipments of hazardous wastes tendered to air carriers be accompanied by the IATA Shipper's Declaration of Dangerous Goods. The consignor is responsible for completion of the form in accordance with IATA requirements and to ensure all packaging, placarding and labeling is consistent with the product being transported.

The International Marine Dangerous Goods Code requires use of the International Marine Organization's Multimodal Dangerous Goods Form when transporting dangerous goods or hazardous waste by ship or barge.

Further information on transporting hazardous waste by air or marine can be obtained by contacting Transport Canada. Information and instructions on manifesting, placarding and labeling hazardous waste commonly generated in Nunavut can be obtained by referring to waste-specific guidelines produced by the Department of Environment. A complete listing of guidelines is available at http://env.gov.nu.ca/programareas/environmentprotection.

Conclusion

This is a general introduction to the risks associated with hazardous waste and is intended to inform the reader about the proper handling, storage and transportation of hazardous waste in Nunavut. Detailed guidance on the management of specific waste types can be obtained by referring to other guidelines developed by the Department of Environment.

For additional information on the management of hazardous waste, or to obtain a complete listing of available guidelines, contact the Department of Environment at:

Environmental Protection Division
Department of Environment
Government of Nunavut
Inuksugait Plaza, Box 1000, Station 1360
Iqaluit, Nunavut, X0A 0H0

Phone: (867) 975-7729
Fax: (867) 975-7739
Email: EnvironmentalProtection@gov.nu.ca
Website: http://env.gov.nu.ca/programareas/environmentprotection

References

Government of Alberta, Department of Environment. Alberta Users Guide for Waste Managers, (Catalogue # ENV-266-O/P).

Government of Alberta, Department of Environment. Hazardous Waste Storage Guidelines, (1988).

Government of the Northwest Territories, Department of Environment and Natural Resources. User's Guide for Hazardous Waste Movement Documents in the NWT, (2009).

Government of the Northwest Territories, Department of Municipal and Community Affairs. Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories, (2003).

Government of Nunavut, Department of Environment. Environmental Guideline for General Management of Hazardous Waste, (2002).

Government of Nunavut, Department of Environment. Environmental Guideline for Industrial Projects on Commissioner's Lands, (2002).

Government of Nunavut, Department of Environment. Environmental Guideline for Industrial Waste Discharges, (2002).

APPENDICES

APPENDIX 1 - *ENVIRONMENTAL PROTECTION ACT*

The following are excerpts from the *Environmental Protection Act*

1. "Contaminant" means any noise, heat, vibration or substance and includes such other substance as the Minister may prescribe that, where discharged into the environment,
   (a) endangers the health, safety or welfare of persons,
   (b) interferes or is likely to interfere with normal enjoyment of life or property,
   (c) endangers the health of animal life, or
   (d) causes or is likely to cause damage to plant life or to property;

   "Discharge" includes, but not so as to limit the meaning, any pumping, pouring, throwing, dumping, emitting, burning, spraying, spreading, leaking, spilling, or escaping;

   "Environment" means the components of the Earth and includes
   (a) air, land and water,
   (b) all layers of the atmosphere,
   (c) all organic and inorganic matter and living organisms, and
   (d) the interacting natural systems that include components referred to in paragraphs (a) to (c).

   "Inspector" means a person appointed under subsection 3(2) and includes the Chief Environmental Protection Officer.

2.2 The Minister may
   (a) establish, operate and maintain stations to monitor the quality of the environment in the Territories;
   (b) conduct research studies, conferences and training programs relating to contaminants and to the preservation, protection or enhancement of the environment;
   (c) develop, co-ordinate and administer policies, standards, guidelines and codes of practice relating to the preservation, protection or enhancement of the environment;
   (d) collect, publish and distribute information relating to contaminants and to the preservation, protection or enhancement of the environment:

3. (1) The Minister shall appoint a Chief Environmental Protection Officer who shall administer and enforce this Act and the regulations.

   (2) The Chief Environmental Protection Officer may appoint inspectors and shall specify in the appointment the powers that may be exercised and the duties that may be performed by the inspector under this Act and regulations.

5. (1) Subject to subsection (3), no person shall discharge or permit the discharge of a contaminant into the environment.

   (3) Subsection (1) does not apply where the person who discharged the contaminant or permitted the discharge of the contaminant establishes that
   (a) the discharge is authorized by this Act or the regulations or by an order issued under this Act or the regulations;
   (b) the contaminant has been used solely for domestic purposes and was discharged from within a dwelling house;
   (c) the contaminant was discharged from the exhaust system of a vehicle;
   (d) the discharge of the contaminant resulted from the burning of leaves, foliage, wood, crops or stubble for domestic or agricultural purposes;

(e) the discharge of the contaminant resulted from burning for land clearing or land grading;
(f) the discharge of the contaminant resulted from a fire set by a public official for habitat management of silviculture purposes;
(g) the contaminant was discharged for the purposes of combating a forest fire;
(h) the contaminant is a soil particle or grit discharged in the course of agriculture or horticulture; or
(i) the contaminant is a pesticide classified and labelled as "domestic" under the *Pest Control Products Regulations* (Canada).

(4) The exceptions set out in subsection (3) do not apply where a person discharges a contaminant that the inspector has reasonable grounds to believe is not usually associated with a discharge from the excepted activity.

5.1. Where a discharge of a contaminant into the environment in contravention of this Act or the regulations or the provisions of a permit or license issued under this Act or the regulations occurs or a reasonable likelihood of such a discharge exists, every person causing or contributing to the discharge or increasing the likelihood of such a discharge, and the owner or the person in charge, management or control of the contaminant before its discharge or likely discharge, shall immediately:
(a) subject to any regulations, report the discharge or likely discharge to the person or office designated by the regulations;
(b) take all reasonable measures consistent with public safety to stop the discharge, repair any damage caused by the discharge and prevent or eliminate any danger to life, health, property or the environment that results or may be reasonably expected to result from the discharge or likely discharge; and
(c) make a reasonable effort to notify every member of the public who may be adversely affected by the discharge or likely discharge.

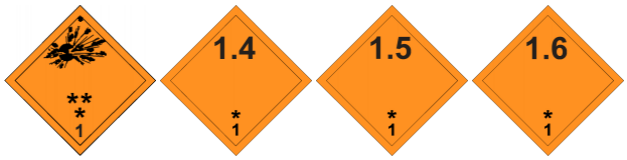
6. **(**1) Where an inspector believes on reasonable grounds that a discharge of a contaminant in contravention of this Act or the regulations or a provision of a permit or license issued under this Act or the regulations has occurred or is occurring, the inspector may issue an order requiring any person causing or contributing to the discharge or the owner or the person in charge, management or control of the contaminant to stop the discharge by the date named in the order.

7. (1) Notwithstanding section 6, where a person discharges or permits the discharge of a contaminant into the environment, an inspector may order that person to repair or remedy any injury or damage to the environment that results from the discharge.

(2) Where a person fails or neglects to repair or remedy any injury or damage to the environment in accordance with an order made under subsection (1) or where immediate remedial measures are required to protect the environment, the Chief Environmental Protection Officer may cause to be carried out the measures that he or she considers necessary to repair or remedy an injury or damage to the environment that results from any discharge.

APPENDIX 2 - DANGEROUS GOODS CLASSIFICATIONS

Class 1 – Explosives[1]



Class 2 – Compressed Gases
Division 2.1 – Flammable Gases
Division 2.2 – Non-flammable and Non-toxic Gases
Division 2.3 – Poison Gases

Class 3 - Flammable Liquids

Class 4 – Flammable Solids
Division 4.1 – Flammable Solids
Division 4.2 – Spontaneously Combustible
Division 4.3 – Water Reactive

Class 5 - Oxidizing Substances and Organic Peroxides
Division 5.1 – Oxidizing Substances
Division 5.2 – Organic Peroxides

Class 6 - Toxic and Infectious Substances
Division 6.1 – Toxic Substances
Division 6.2 – Infectious Substances

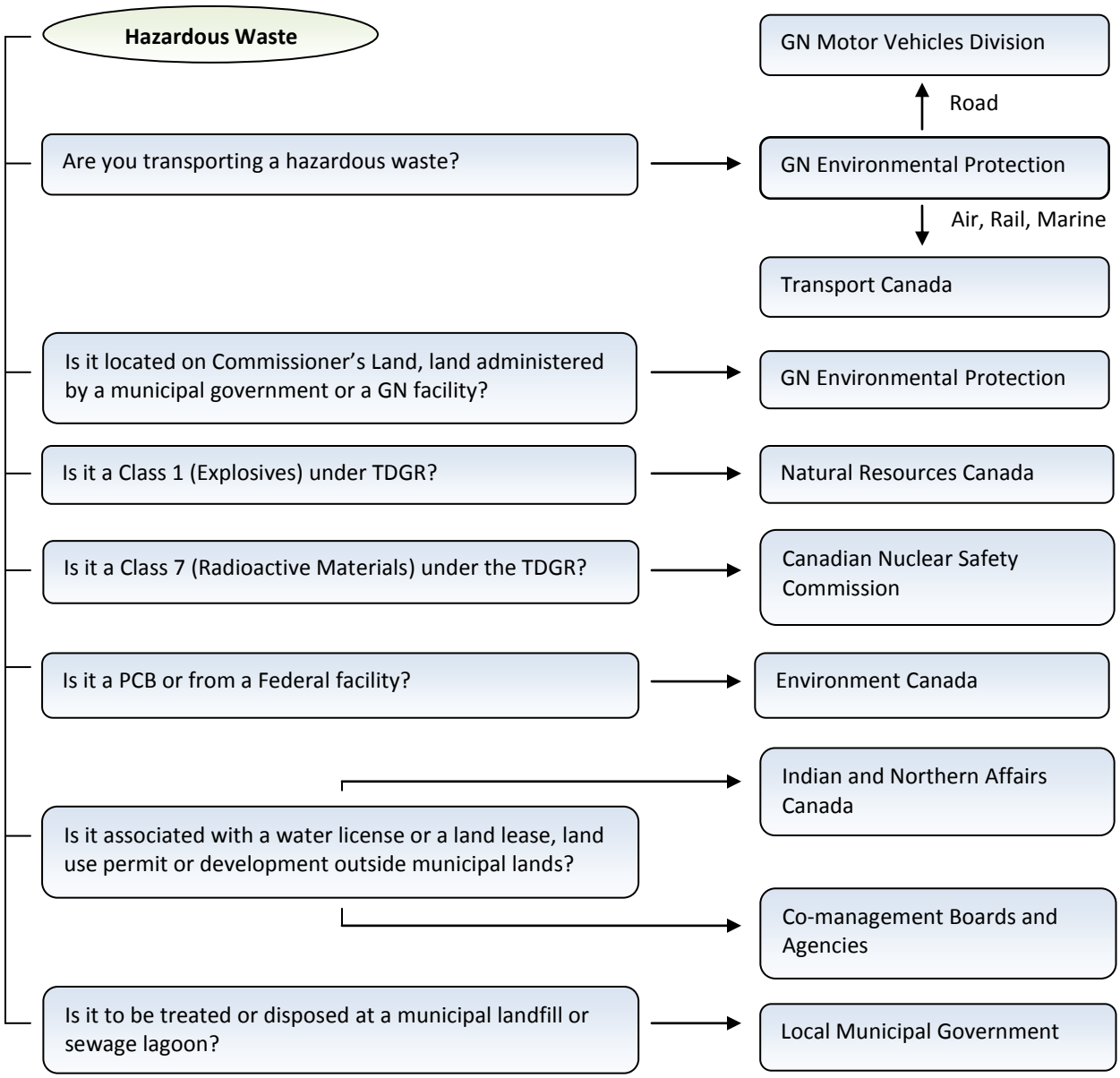
Class 7 - Radioactive Materials[2]

Class 8 - Corrosives

Class 9 - Miscellaneous

1. Class 1 substances (Explosives) are regulated by Natural Resources Canada under the *Explosives Act*.
2. Class 7 substances (Radioactive Materials) are regulated by the Canadian Nuclear Safety Commission under the *Nuclear Safety and Control Act* and *Nuclear Liability Act*.

APPENDIX 3 - DETERMINING REGULATORY AGENCY CONTACTS



APPENDIX 4 – REGISTRATION FORM – HAZARDOUS WASTE GENERATOR

A copy of the generator registration form and users' guide is available by contacting the Department of Environment or by downloading at http://env.gov.nu.ca/programareas/environmentprotection.

Instructions

1. The following information must be provided in order to register as a hazardous waste generator in Nunavut and to obtain a generator number. Incomplete applications will be returned to the applicant.
2. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to EnvironmentalProtection@gov.nu.ca.
3. Use additional pages to provide information as required.
4. Applicants should refer to the accompanying users' guide for further assistance on completing the generator registration form.

Section 1 - Identification

Generator (Legal Name) _____

Mailing Address _____ Postal Code _____

Principle Contact Person _____ Title _____

Phone _____ Email _____

Alternate Contact Person _____ Title _____

Phone _____ Email _____

Section 2 - Description of Waste Generated (provide a separate table if required)

Site Location(s) where Waste is Generated _____

Shipping Name (Description)	TDG Number	TDG Class	Quantity Generated each Month (L or Kg)	Frequency of Generation

Section 3 - Waste Management Information

General Type of Business _____

Source of Waste _____

Hazardous Waste Carrier(s) Used _____

Hazardous Waste Receiver(s) Used _____

Do you have an approved Emergency Response and Spill Contingency Plan? Yes ____ (attach copy) No _____

Section 4 - Certification

I certify that the information provided on this form is correct, accurate and complete.

Signature of Contact Person _____ Date (dd/mm/yy) _____

Print Name of Contact Person _____ Title _____

Phone _____ Email _____

For Department Use Only
Generator Number NUG# _____ Approved by _____ Date _____

APPENDIX 5 – REGISTRATION FORM – HAZARDOUS WASTE CARRIER

A copy of the carrier registration form and users' guide is available by contacting the Department of Environment or by downloading at http://env.gov.nu.ca/programareas/environmentprotection.

Instructions

1. The following information must be provided in order to register as a hazardous waste carrier in Nunavut and to obtain a carrier number. Incomplete applications will be returned to the applicant.
2. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to EnvironmentalProtection@gov.nu.ca.
3. Use additional pages to provide information as required.
4. Applicants should refer to the accompanying users' guide for further assistance on completing the carrier registration form.

Section 1 - Identification

Carrier (Legal Name) _____

Corporate Address _____

Site (Dispatch) Address _____

Principle Contact Person _____ Title _____

Phone _____ Email _____

Alternate Contact Person _____ Title _____

Phone _____ Email _____

Section 2 - Description of Waste Transported (provide a separate table if required)

Shipping Name (Description)	TDG Number	TDG Class	Quantity Transported each Month (L or Kg)	Frequency of Transport

Section 3 - Waste Management Information

Mode of Transport (check all that apply) Road _____ Rail _____ Marine _____ Air _____

Hazardous Waste Generator(s) Used _____

Hazardous Waste Receiver(s) Used _____

Do you have an approved Emergency Response and Spill Contingency Plan? Yes _____ (attach copy) No _____

Section 4 - Certification

I certify that the information provided on this form is correct, accurate and complete.

Signature of Contact Person _____ Date (dd/mm/yy) _____

Print Name of Contact Person _____ Title _____

Phone _____ Email _____

For Department Use Only
Carrier Number NUC# _____ Approved by _____ Date _____

APPENDIX 6 – REGISTRATION FORM – HAZARDOUS WASTE RECEIVER

A copy of the receiver registration form and users' guide is available by contacting the Department of Environment or by downloading at http://env.gov.nu.ca/programareas/environmentprotection.

Instructions

1. The following information must be provided in order to register as a hazardous waste receiver in Nunavut and to obtain a receiver number. Incomplete applications will be returned to the applicant.
2. A receiver who operates a commercial business for the purpose of collecting, storing, transferring, treating, recycling or disposing of hazardous waste may be required to register the facility as a hazardous waste management facility. Refer to section 3.2.2 of the *Environmental Guideline for the General Management of Hazardous Waste* for further information.
3. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to EnvironmentalProtection@gov.nu.ca.
4. Use additional pages to provide information as required.
5. Applicants should refer to the accompanying users' guide for further assistance on completing the receiver registration form.

Section 1 - Identification

Receiver (Legal Name) _____

Mailing Address _____ Postal Code _____

Principle Contact Person _____ Title _____

Phone _____ Email _____

Alternate Contact Person _____ Title _____

Phone _____ Email _____

Section 2 - Description of Waste Received (provide a separate table if required)

Site Location(s) where Waste is Received _____

Shipping Name (Description)	TDG Number	TDG Class	Quantity Received each Month (L or Kg)	Frequency of Acceptance

Attach a brief description of the proposed facility.

Section 3 - Waste Management Information

General Type of Business _____

General Type of Activity _____

Hazardous Waste Generator(s) Used _____

Hazardous Waste Carriers(s) Used _____

Hazardous Waste Management Facilities Used _____

Do you have an approved Emergency Response and Spill Contingency Plan? Yes _____ (attach copy) No _____

Section 4 - Certification

I certify that the information provided on this form is correct, accurate and complete.

Signature of Contact Person _____ Date (dd/mm/yy) _____

Print Name of Contact Person _____ Title _____

Phone _____ Email _____

For Department Use Only
Receiver Number NUR# _____ Approved by _____ Date _____

APPENDIX 7
REGISTRATION FORM – HAZARDOUS WASTE MANAGEMENT FACILITY

A copy of the management facility registration form and users' guide is available by contacting the Department of Environment or by downloading at http://env.gov.nu.ca/programareas/environmentprotection.

Instructions

1. The following information must be provided in order to register as a hazardous waste management facility in Nunavut and obtain a management facility number. Incomplete applications will be returned to the applicant.
2. Completed registration forms are to be forwarded to the Manager of Pollution Control, Department of Environment, Government of Nunavut, Box 1000, Station 1360, Iqaluit, Nunavut, X0A 0H0. Electronic registration forms are preferred and may be forwarded to EnvironmentalProtection@gov.nu.ca.
3. Use additional pages to provide information as required.
4. Applicants should refer to the accompanying users' guide for further assistance on completing the management facility registration form.

Section 1 - Identification

Applicant (Legal Name) _____

Corporate Address _____

Facility Address _____

Principle Contact Person _____ Title _____

Phone _____ Email _____

Alternate Contact Person _____ Title _____

Phone _____ Email _____

Section 2 - Description of Waste to be Managed (provide a separate table if required)

Site Location(s) where Waste is Managed _____

Shipping Name (Description)	TDG Number	TDG Class	Quantity Managed each Month (L or Kg)	Frequency of Acceptance

Attach a complete description of the proposed facility, safety measures, equipment and management processes to be used. Include engineered drawing where applicable.

Section 3 - Waste Management Information

General Type of Business (check all that apply) Receiver of Waste _____ Manage Self-generated Waste _____

Type of Activity (check all that apply) Collect and Store _____ Transfer _____

Treat _____ Recycle _____ Dispose _____

Hazardous Waste Generator(s) Used _____

Hazardous Waste Carriers(s) Used _____

Do you have an approved Emergency Response and Spill Contingency Plan? Yes _____ (attach copy) No _____

Section 4 - Certification

I certify that the information provided on this form is correct, accurate and complete.

Signature of Contact Person _____ Date (dd/mm/yy) _____

Print Name of Contact Person _____ Title _____

Phone _____ Email _____

For Department Use Only
Management Facility Number NUF# _____ Approved by _____ Date _____

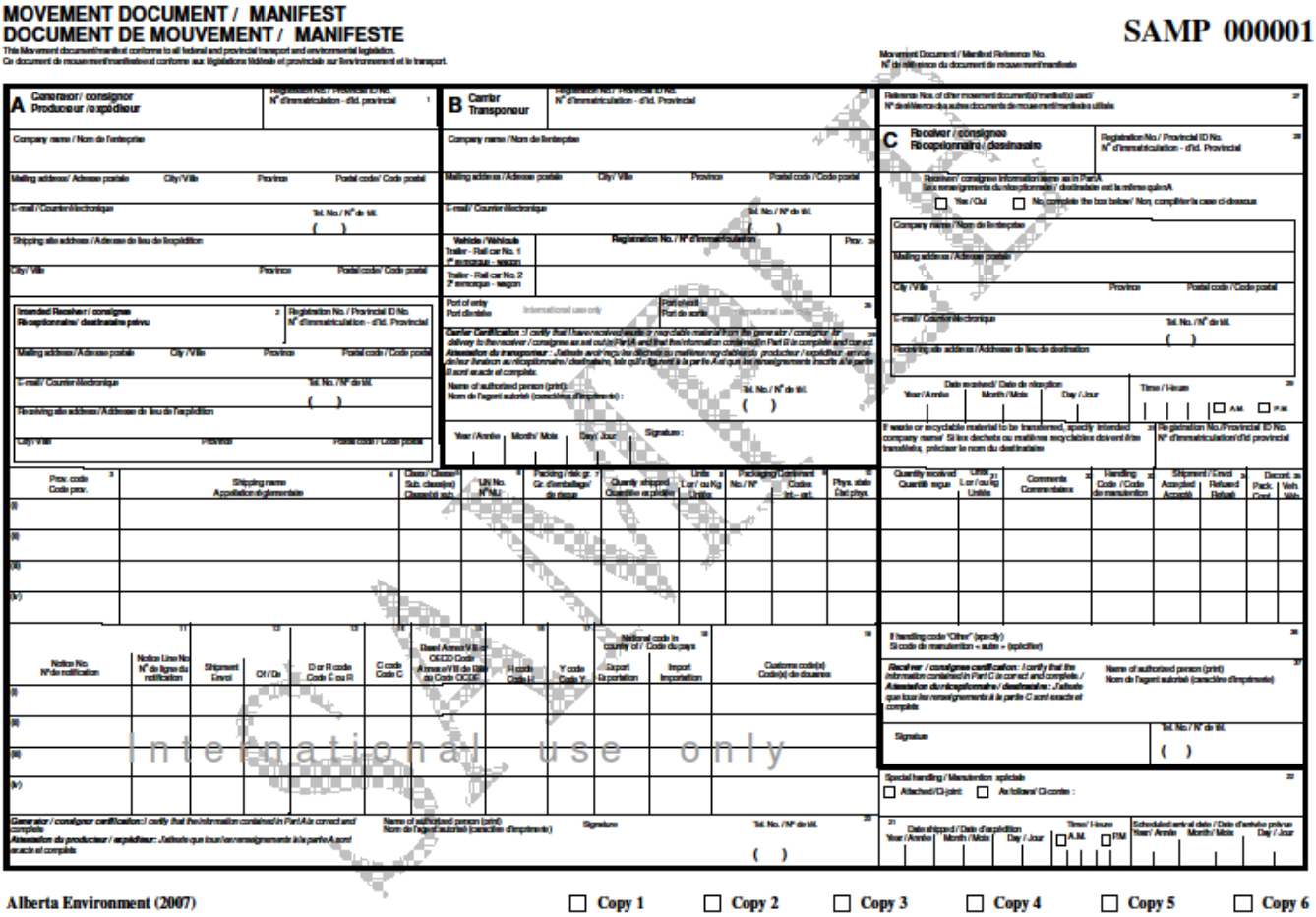
APPENDIX 8 - CRITERIA FOR REGISTERING A HAZARDOUS WASTE MANAGEMENT FACILITY

A facility must be registered with the Department of Environment as a hazardous waste management facility where it is used for commercial purposes to store hazardous waste for a period of 180 days or more or the quantity of hazardous waste[1] stored on-site at any one time exceeds the criteria established in the following table. Where the facility is to be used for the treatment, recycling or disposal of hazardous waste, the facility must be registered as a hazardous waste management facility where the quantity treated, recycled or disposed of each month exceeds a 'small quantity'[2].

	Description	**Quantity[3] (Kg or L)**
Class 1	Explosives	50
Class 2	Division 2.1 – Flammable Gases	500[4]
	Division 2.2 – Non-flammable and Non-toxic Gases	5000[4]
	Division 2.3 – Poison Gases	200[4]
Class 3	Flammable Liquids	4000
Class 4	Division 4.1 – Flammable Solids	5000
	Division 4.2 – Spontaneously Combustible	1000
	Division 4.3 – Water Reactive	500
Class 5	Division 5.1 – Oxidizing Substances	1000
	Division 5.2 – Organic Peroxides	50
Class 6	Division 6.1 – Toxic Substances	1000
	Division 6.2 – Infectious Substances	500[4]
Class 7	Radioactive Materials	Any amount
Class 8	Corrosives	1000
Class 9	Miscellaneous	1000
	PCB Materials	50
	Environmentally Hazardous Substance Solid – UN3077	5000
All Classes	Total Aggregate Quantity	5000

1. Applies to hazardous waste only and not to dangerous goods.
2. Small quantity means hazardous waste that is generated in an amount that is less than five kilograms per month if a solid or less than five litres per month if a liquid, and where the total quantity accumulated at any one time does not exceed five kilograms or five litres. This does not include hazardous waste that is mercury or Class 2.3, 5.1 or 6.1 materials. These wastes must be generated in an amount that is less than one kilogram per month if a solid or less than one litre per month if a liquid, and where the total quantity accumulated at any one time does not exceed one kilogram or one litre.
3. Quantity applies to solids when expressed in kilograms (kg) and liquids when expressed in litres (L).
4. Total liquid capacity of the container.

APPENDIX 9 – HAZARDOUS WASTE MANIFEST



MOVEMENT DOCUMENT / MANIFEST
DOCUMENT DE MOUVEMENT / MANIFESTE

SAMP 000001

This Movement document/manifest conforms to all federal and provincial transport and environmental legislation.
Ce document de mouvement/manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport.

Movement Document / Manifest Reference No.
N° de référence du document de mouvement/manifeste

A Generator / consignor
Producteur / expéditeur

Registration No./ Provincial ID No.
N° d'immatriculation - d'id. provincial

Company name / Nom de l'entreprise

Mailing address/ Adresse postale | City/ Ville | Province | Postal code/ Code postal

E-mail / Courriel électronique | Tel. No. / N° de tél.

Shipping site address / Adresse de lieu de l'expédition

City/ Ville | Province | Postal code/ Code postal

Intended Receiver / consignee
Récipiendaire/ destinataire prévu

Registration No. / Provincial ID No.
N° d'immatriculation - d'id. Provincial

Mailing address/ Adresse postale | City/ Ville | Province | Postal code / Code postal

E-mail/ Courriel électronique | Tel. No. / N° de tél.

Receiving site address / Address de lieu de l'expédition

City/ Ville | Province | Postal code / Code postal

B Carrier
Transporteur

Registration No./ Provincial ID No.
N° d'immatriculation - d'id. Provincial

Company name / Nom de l'entreprise

Mailing address / Adresse postale | City/ Ville | Province | Postal code / Code postal

E-mail/ Courriel électronique | Tel. No. / N° de tél.

Vehicle / Véhicule
Trailer - Rail car No. 1
1er remorque - wagon
Trailer - Rail car No. 2
2e remorque - wagon

Registration No. / N° d'immatriculation | Prov.

Port of entry
Port d'entrée
International use only

Port of exit
Port de sortie
International use only

Carrier Certification: I certify that I have received waste or recyclable material from the generator / consignor for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct.
Attestation du transporteur : J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au récipiendaire / destinataire, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets.

Name of authorized person (print)
Nom de l'agent autorisé (caractères d'imprimerie)

Tel. No. / N° de tél.

Year / Année | Month / Mois | Day / Jour | Signature

C Receiver / consignee
Récipiendaire / destinataire

Registration No. / Provincial ID No.
N° d'immatriculation - d'id. Provincial

Receiver / consignee information same as in Part A
Les renseignements du récipiendaire / destinataire sont la même que ceux de la partie A
Yes / Oui | No, complete the box below / Non, compléter la case ci-dessous

Company name / Nom de l'entreprise

Mailing address / Adresse postale

City / Ville | Province | Postal code / Code postal

E-mail / Courriel électronique | Tel. No. / N° de tél.

Receiving site address / Address de lieu de destination

Date received / Date de réception
Year / Année | Month / Mois | Day / Jour

Time / Heure
A.M. | P.M.

If waste or recyclable material to be transferred, specify intended company name/ Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire

Registration No./Provincial ID No.
N° d'immatriculation/d'id provincial

Prov. code Code prov.	Shipping name Appellation réglementaire	Class/ Classe Sub. class(es) Classe(s) sub.	UN No. N° NU	Packing / risk gr. Gr. d'emballage/ de risque	Quantity shipped Quantité expédiée	Units L or / ou Kg Unités	Packaging/ Contenant No. / N°	Packaging/ Contenant Codes Int. – act.	Phys. state Etat phys.
(i)									
(ii)									
(iii)									
(iv)									

Quantity received Quantité reçue	Units L or / ou Kg Unités	Comments Commentaires	Handling Code / Code de manutention	Shipment / Load Accepted Accepté	Shipment / Load Refused Refusé	Decont. as Pack. Cont.	Decont. as Veh. Véh.

Notice No. N° de notification	Notice Line No. N° de ligne de notification	Shipment Envoi	Ot / De	D or R code Code D ou R	C code Code C	Basel Annex VIII or OECD Code Annexe VIII de Bâle ou Code OCDE	H code Code H	Y code Code Y	National code in country of / Code du pays Export Exportation	National code in country of / Code du pays Import Importation	Customs code(s) Code(s) de douane
(i)											
(ii)											
(iii)											
(iv)											

International use only

If handling code "Other" (specify)
Si code de manutention « autre » (spécifier)

Receiver / consignee certification: I certify that the information contained in Part C is correct and complete. / Attestation du récipiendaire / destinataire : J'atteste que tous les renseignements à la partie C sont exacts et complets

Name of authorized person (print)
Nom de l'agent autorisé (caractères d'imprimerie)

Signature | Tel. No. / N° de tél.

Special handling / Manutention spéciale
Attached / Ci-joint | As follows / Ci-contre :

Generator / consignor certification: I certify that the information contained in Part A is correct and complete.
Attestation du producteur / expéditeur : J'atteste que tous les renseignements à la partie A sont exacts et complets

Name of authorized person (print)
Nom de l'agent autorisé (caractères d'imprimerie)

Signature | Tel. No. / N° de tél.

Date shipped / Date d'expédition
Year / Année | Month / Mois | Day / Jour

Time / Heure
A.M. | P.M.

Scheduled arrival date / Date d'arrivée prévue
Year / Année | Month / Mois | Day / Jour

Alberta Environment (2007)

Copy 1 | Copy 2 | Copy 3 | Copy 4 | Copy 5 | Copy 6

APPENDIX 10 - WASTE EXCHANGES AND ASSOCIATIONS

The concept of exchanging waste began in Canada in the 1980s. It involves the transfer of unwanted, overstocked, obsolete, damaged, contaminated or post-dated material and waste to another company or person who would reuse it. Various waste exchanges and associations have been established in Canada to facilitate these transfers. Several, but not all, waste exchanges and associations are listed below.

Northern Territories Water and Waste Association
201, 4817- 49 Street
Yellowknife, Northwest Territories X1A 3S7
(867) 873-4325
http://www.ntwwa.com

Recycling Council of British Columbia
Unit #10, 119 West Pender Street
Vancouver, British Columbia V6B 1S5
(604) 683-6009
http://www.rcbc.bc.ca

Alberta Waste Materials Exchange
Building #350, 6815 Eighth Street NE
Calgary, Alberta T2E 7H7
(403) 297-7505

Calgary Materials Exchange
809 Fourth Avenue NE
Calgary, Alberta T2P 0K5
(403) 230-1443
http://www.cmex.ca

Saskatchewan Waste Materials Exchange
515 Henderson Drive.
Regina, Saskatchewan S4N 5X1
(306) 787-9800

Manitoba Waste Exchange
1329 Niakwa Road
Winnipeg, Manitoba R2J 3T4
(204) 257-3891

Ontario Waste Exchange
OCETA 63 Polson Street, 2nd floor
Toronto, Ontario M5A 1A4
(416) 778-4199
http://www.owe.org

Canadian Waste Materials Exchange
2395 Spearman Drive
Mississauga, Ontario L5K 1B3
(416) 822-4111

Canadian Chemical Exchange
900 Blondin
Ste-Adele, Quebec J0R 1L0
(450) 229-6511
http://www.stobec.com

Quebec Waste Materials Exchange
14 Place du Commerce, Bureau 350
Le-des-Squeurs, Quebec H3E 1T5
(514) 762-9012

APPENDIX 11 – GOVERNMENT CONTACTS

Government of Nunavut

Environmental Protection Division
Department of Environment
Inuksugait Plaza
P.O. Box 1000, Station 1360
Iqaluit, Nunavut X0A 0H0
Telephone: (867) 975-7729 Fax: (867) 975-7739

Workers' Safety and Compensation Commission
P.O. Box 669
Baron Building/1091
Iqaluit, Nunavut X0A 0H0
Telephone: 1-877-404-4407 (toll free) Fax: 1-866-979-8501

Office of Chief Medical Health Officer of Health
Department of Health and Social Services
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Appendix D

End-of-Life Vehicle Hazerdous Materials Recovery Program Manual

End-of-Life Vehicle Hazardous Materials Recovery Program Manual

Manual for the Preparation and Disposal of End-of-Life Vehicles in Nunavut

Final Report

January 2011

Government of Nunavut

Project # 10-3574-2000

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Department of Environment

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1 INTRODUCTION

In 2004 the Government of Nunavut identified the disposition of End of Life Vehicles (ELVs) as a priority issue. The Departments of Environment (GN-DoE), Economic Development and Transportation and Community and Government Services were directed to initiate a pilot program to repatriateEnd-of-Life Vehicles (ELVs)to the south. A project was initiated at Iqaluit which resulted in the processing of approximately 3,600 tonnes of scrap metal.

Throughout the project, the GN-DoE had concerns with respect to the environmental impacts of the operation; specifically with respect to the hazardous materials present in the ELVs. Not having any previous experience with vehicle crushing operations put the Department at a disadvantage in terms of being able to direct the operators to conduct their activities in accordance with nationally and industry-accepted standards for vehicle crushing and bailing operations. It was decided that there is a need for an environmental manual to capture such operations in Nunavut.

The purpose of this manual is to provide Municipal Solid Waste (MSW) facility and other operators with a guide for the proper removal, storage and handling of potential hazardous materials from ELVs. This removal will allow these ELVs to be safely stored prior to ultimate removal of ELVs from Nunavut communities.

ELV recycling programs exist across Canada; however, due to their remote locations communities in Nunavut have limited access to these programs. By training local community staff to properly handle and prepare ELVs for shipping and recycling, more of these items can be removed from communities. Removal of these items has both environmental and aesthetic benefits, contributes to overall organization of the community and increases the available landfill capacity.

Information provided in this manual has been compiled from numerous sources including:

- The National Code of Practice for Automotive Recyclers Participating in the National Vehicle Scrappage Program.
- Department of Sustainable Development, Government of Nunavut.
- Summerhill Impact “Switch Out” Program.
- British Columbia Ministry of Environment’s “Guidebook for the Vehicle Dismantling and Recycling Industry Environmental Planning Regulation”.
- Interviews with automotive recyclers.

2 BACKGROUND

As part of the Government of Nunavut's objective of INUUQATIGIITTIARNIQ: HEALTHY COMMUNITIES, the Department of Environment was directed to initiate a pilot program that looked into the task of dismantling ELVs and removing them from Nunavut communities (Department of Environment, Government of Nunavut, 2006). This program has begun in Iqaluit where a pilot project to crush and remove ELVs from the city has been in progress since 2008. ELVs were collected, crushed on-site and then prepared for shipment to southern recycling and disposal facilities. Shipment of crushed and prepared vehicles to southern facilities is planned for the summer of 2010.

Other communities have also benefited from similar pilot projects. During the summer of 2004 and 2005, a pilot project to removed scrap metal and vehicles from Rankin Inlet was implemented. The pilot project was able to remove 106 tons of scrap metal from the community. The completion of the pilot project led the community to begin formation of the Rankin Inlet Salvage Company, established to create income to sustain the scrap metal recycling program once the pilot project was complete (North Central Development, 2006).

There are a number of hazardous materials found in vehicles that should be removed from ELVs prior to crushing or further processing. Some of these materials include gasoline, engine oil, fluids (transmission, brake, power steering, etc.), batteries, mercury switches and refrigerants. If these items are not removed prior to crushing the ELVs, these materials may be disbursed into the surrounding environment. According to the Ontario Automotive Recyclers Association (OARA) (reference found in VT Solid Waste Districts and Alliances, 2002), the amount of fluids to be removed is estimated at around 5 US gallons per vehicle. The following table shows the break down of fluids per type as estimated by the OARA:

Table 1: Estimated Amount of Fluids per Vehicle (OARA)

Fluid Type	US Gallons per Vehicle	Litres
Fuel	2.70	10.2
Engine Oil	0.96	3.6
Coolant	0.73	2.8
Transmission Oil	0.34	1.3
Steering Gear Oil	0.20	0.8

The main purpose of this manual is to provide Municipal Solid Waste (MSW) facility and other operators with a guide for the proper removal, storage and handling of potential hazardous materials from ELVs. This removal will allow these ELVs to be safely stored prior to ultimate removal of ELVs from Nunavut communities. A section has also been incorporated to cover dismantling of waste appliances as some of the dismantling requirements for waste appliances are similar to those of ELVs.

3 SCRAP VEHICLE AND METAL RECOVERY OPERATION

3.1 Required Equipment

The following is a recommended list of equipment that would be required to operate an ELV dismantling facility in Nunavut:

- Secured building with garage bay style door, concrete floor, adequate roof and no drains leading to a sewer, sewage tank or stormwater collection system (National Code of Practice, 2008 and British Columbia Ministry of Environment, 2008). Alternate for smaller locations is to undertake work outdoors in dry warm weather only upon an impermeable working surface. The constructed vehicle fluid recovery area should consist of, for example, a protective sand layer/poly liner/sand layer covered with a plywood working surface.
- Forklift or other heavy machinery to move ELVs from receiving area to dismantling area and then from dismantling area to vehicle hulk storage area.
- Gasoline evacuation pump with filter.
- Small wheel hoists to lift car high enough to drain fluids.
- Small hand pumps for removal of engine oil, transmission fluid, gear oil, coolants and brake fluid.
- Containers for storage of oils, antifreeze, windshield washer fluid, etc.
- Portable refrigerant removal device with separate storage tanks for each type of refrigerant.
- Drip pans to catch fluids.
- Spill kit to clean up spills.

3.2 Training Requirements

The main training requirements for employees working at an ELV recycling facility are:

- Proper collection, handling, storage and disposal of hazardous materials.
- Spill prevention and control procedures.
- Certification to remove and store refrigerants from vehicles.

All personnel who work at the facility must have proper training in handling and storing hazardous materials and must follow the procedures set out for the facility. Each facility will be operated according to methods specific to that facility and will be based on available equipment, personnel, shipping schedules and number of ELVs to be processed. The employer should ensure that each employee is trained in the hazardous waste handling and spill response procedures set out specifically for their operation. Please refer to Section 4 for specific handling procedures with regards to hazardous materials.

Removal of refrigerants (i.e. Freon), must be completed by a certified technician. According to the Department of Sustainable Development, Government of Nunavut (2002), a certified service technician is:

"A technician who is otherwise qualified to service ODS containing equipment and has successfully completed an environmental awareness course for ozone depleting substances certified by Environment Canada."

Further training of employees is required if the facility requests to take part in the National Vehicle Scrappage Program. In order to register with the program, employees of the facility must attend a training session provided by the program. This training session may be completed in person or online (National Code of Practice, 2008).

3.3 Administrative Requirements and Record Keeping

Administrative record keeping is essential in the operation of the ELV facility. Based on the National Code of Practice (2008) and British Columbia Ministry of Environment (2008), records must be kept on-site and include the following items:

- Transportation and manifest records from licensed hazardous waste transporters of all hazardous wastes transported. Records should be identified by a manifest number and invoice number and should be kept in a central filing location (kept on-site i.e Community Public Works office, a minimum of two years).
- Copy of the most up-to-date transporters' licence that allows them to transport all hazardous wastes with respect to ELVs.
- Records of staff members qualified to remove refrigerants (must be kept on-site a minimum of two years).
- Records created by qualified refrigerant removal technicians that tested and removed refrigerants from ELVs (kept on-site a minimum of two years).

The following plans and procedures (based on the National Code of Practice (2008) and British Columbia Ministry of Environment (2008)) should also be kept on-site and accessible to all employees:

- Detailed spill response plan and procedures.
- Standard operating procedures that have been developed specifically for the facility.
- Safety and environmental policies and procedures.
- Environmental Management Plans and audit reports.

3.4 Recycling and Processing Areas

According to the National Code of Practice (2008), recycling of ELVs will require space for six (6) different processing activities. These activities include:

- Accepting and storing ELVs.
- Removal of hazardous fluids and wet parts (if required).
- Storing ELV carcasses once wet parts and fluids have been removed.
- Storing hazardous fluids removed from ELVs.
- Storing wet parts removed from ELVs.
- Crushing ELV carcasses (if the site is equipped to complete this activity).

The following sections describe the site requirements for each activity.

3.4.1 Accepting and Storing ELVs and Waste Appliances

The ELV and appliance processing facility must have a space dedicated to storing and inspecting vehicles when they arrive on site. Based on the National Code of Practice (2008), there is no requirement for this area to be paved. However all spills must be cleaned up and any contaminated soils and cleaning materials must be disposed of as hazardous waste, unless materials are tested and shown not to be hazardous. Vehicles should be checked for leaks as they arrive to prevent soil and water contamination in the vehicle storage area. Runoff from the storage area caused by precipitation (rain, snow, etc.) must not be contaminated (National Code of Practice, 2008). Methods to collect and treat runoff may be required. This may include obtaining a water licence for the facility from the Nunavut Water Board.

3.4.2 Dismantling Vehicles and Appliances and Removing Hazardous Materials

Vehicles must be drained of all hazardous fluids prior to crushing the vehicle hulk. Wet parts are parts of the vehicle that contain hazardous fluids such as batteries, fuel tanks, transmissions, radiators and power steering units. Also parts that are leaking fluid, need to be treated as wet parts and their fluids removed.

Figure 1: Vehicle Ready for Dismantling

All hazardous fluids must be removed from ELVs and disposed appliances before safe storage or crushing. If these materials are not removed, hazardous materials may be released into the crushing zone thus contaminating the surrounding area or leaked into the environment during shipping. To ensure safe removal of all hazardous items, the vehicle's battery should be removed first, followed by refrigerants (if present) and thirdly fuel. The order of removal thereafter is not significant. Hazardous items that must be removed include:

- Battery
- Refrigerants
- Gasoline or Diesel
- Antifreeze
- Brake Fluid
- Engine Oil
- Transmission Fluid
- Power Steering Fluid

- Differential Fluid (if present)
- Windshield Washer Fluid
- Ballasts and Capacitors
- Mercury Switches (found in ABS brakes, convenience lighting)
- Lead (battery connectors, wheel weights)

Please refer to Section 4 for proper handling and storage techniques for the listed hazardous materials.

The space used for dismantling vehicles and appliances should have a non-permeable base, such as concrete or poly liner, to provide an easy cleaning surface and to prevent spilled fluids from contaminating the environment. The space should be covered to protect it from the weather and to prevent spilled materials from being washed into the environment. The concrete pad should be high enough to prevent flooding during rainstorm events. An alternate for smaller/temporary locations is to undertake work outdoors in dry warm weather only upon an impermeable working surface. The constructed temporary vehicle fluid recovery area should consist of, for example, a protective sand layer/poly liner/sand layer covered with a plywood working surface. Absorbent materials should be on hand at all times to clean up any spills. All spills must be cleaned up and any contaminated soils and cleaning materials must be disposed of as hazardous waste, unless materials are tested and shown not to be hazardous.

Figure 2: Absorbent Material place over Spilled Vehicle Fluids

3.4.3 Storage of Vehicle and Appliance Carcasses

Once all hazardous materials have been removed, there must be an area designated for the storage of vehicle and appliance hulks. Hulks may be salvaged for useable or recyclable parts. Once the hulks have no more "salvage" value, they may be crushed and shipped south for recycling.

Figure 3: Vehicle Hulks Ready to be Crushed

The vehicle and appliance hulk storage area must be kept clean and any spills or leaks must be cleaned up immediately. Contaminated soil and materials must be discarded as hazardous wastes, unless tested and determined to be non-hazardous. Care must be taken not to contaminate any water or runoff from the area (National Code of Practice, 2008).

3.4.4 Storage of Hazardous Fluids

Hazardous fluids must be stored in proper containers and separated appropriately. These containers should be kept in the vehicle dismantling area, stored on the concrete pad. This will provide easy access to the containers when draining fluids from vehicles. Storing in this area will also provide protection from the weather and a non-permeable surface to store the containers on. Fuels must be stored in a separate well-ventilated area of a building or outdoors protected from the weather (British Columbia Ministry of Environment, 2008). Contact the Fire Marshall for specific instructions on the storage of fuels. Please refer to Section 4 for proper handling and storage techniques for each hazardous material.

Figure 4: Example of Plastic Totes Used for Collection of Vehicle Fluids - Not Used for Gasoline

3.4.5 Crushing Area for ELV and Appliance Hulks

Crushing of vehicles and appliances is intended to reduce the volume for shipping. Crushing may consist of flattening an auto or logging. Logging an auto consists of compressing an auto into a rectangular cube. A crusher may be brought to site and operated by a third-party when quantity of hulks warrant. If so, the crushing area must be large enough to accommodate the crusher and also have a space designated for the storage of crushed vehicles. According to the National Code of Practice (2008) and the British Columbia Ministry of Environment (2008), the following items should be completed in conjunction with crushing operations:

- All hazardous materials must be removed from the vehicles prior to crushing.
- Any spills must be cleaned up immediately and all contaminated soil and cleaning materials must be disposed of as hazardous waste (unless tested and shown otherwise).
- Any water resulting from the crushing operations should be treated through oil absorbent filters.
- Once the crusher has been removed from site, the site should be cleaned and debris removed to landfill.

Figure 5: Vehicle Crusher in Operation

Figure 6: Example of "Logged" Metal

3.5 Site Security

Site security is very important. ELV processing operations may become targets for vandalism and theft and may lead to injury or environmental contamination. Therefore, it is extremely important to keep all equipment locked and inaccessible to the public. Hazardous materials and vehicle dismantling equipment should be stored in a secured location. Any machinery such as the crushing equipment should be locked and tagged out at the end of each day to prevent injury as well as stored in a secured location.

4 COLLECTION, STOCKPILING AND DISPOSAL OF HAZARDOUS ITEMS

All hazardous fluids must be removed from ELVs before safe storage or crushing. If these materials are not removed, hazardous materials may be released during storage or crushing or leaked into the environment during shipping. To ensure safe removal of all hazardous items, the battery should be removed first, followed by refrigerants (if present) and thirdly fuel. The order of removal thereafter is not significant. Hazardous items that must be removed include:

- Battery
- Refrigerants
- Gasoline or Diesel
- Antifreeze
- Brake Fluid
- Engine Oil
- Transmission Fluid
- Power Steering Fluid
- Differential Fluid (if present)
- Windshield Washer Fluid
- Mercury Switches (found in ABS brakes, convenience lighting)

4.1 Waste Batteries

4.1.1 Collection

A vehicle's battery should be removed in order to de-energize the ELV. This will allow the safe removal of all other materials. Waste batteries from ELVs contain corrosive fluids and heavy metals that may contaminate the environment if not stored and disposed properly (Department of Sustainable Development, Government of Nunavut, 2002). Therefore, all waste batteries from ELVs must be removed during the dismantling process.

Figure 7: Removing Battery from Vehicle

4.1.2 Stockpiling

Waste batteries should be stored in a leak-proof drum (metal or plastic) with a secured lid to protect batteries from rain and snow. Batteries may be stacked, but a layer of cardboard or plywood must be placed between the layers of batteries. If batteries are stacked without cardboard or plywood between the layers, there is the potential for the batteries to short and cause an electrical fire. The batteries must be secured to the pallets by nylon straps and must not be stacked more than two batteries high. A polyethylene containment liner must be used and must be large enough to place under the batteries and then wrap around them to create a sealed containment unit (Department of Sustainable Development, Government of Nunavut, 2002).

Figure 8: Batteries Not Correctly Stored

4.1.3 Disposal

Waste batteries may be sent to recycling facilities in southern Canada. The ELV operator will have to contact a recycling/disposal facility and make arrangements for that facility to receive the waste batteries. Please contact the appropriate transport authority (marine, rail, road) for appropriate shipping and transportation instructions of waste batteries (Department of Sustainable Development, Government of Nunavut, 2002). Ensure that manifests and transportation records are kept on-site.

4.2 Refrigerants

4.2.1 Collection

Refrigerants should be removed after the battery has been removed and prior to removal of any other fluids or items from ELVs. This is to prevent an accidental release of refrigerants into the atmosphere.

Removal of refrigerants must be performed only by a certified technician. Technicians must use an approved portable refrigerant recovery unit to remove refrigerants from ELVs. They must also record the amount of refrigerant removed per vehicle. Once refrigerants have been removed, the technician must clearly label each vehicle as such (British Columbia Ministry of Environment, 2008).

4.2.2 Stockpiling

Refrigerants must be stored in approved, refillable storage containers. They must not be vented to the atmosphere. Storage containers must be properly labelled and should be replaced or hydrostatically tested every five (5) years (British Columbia Ministry of Environment, 2008).

Figure 9: Refrigerant Evacuation Unit

Records of all refrigerants removed from ELVs must be maintained on-site. Records should contain the amount of refrigerant removed from each vehicle, the date it was removed, name of the certified technician who performed the recovery, registration number of the certified technician, whether the technician performed the service as an employee or agent of the business and the name of the business responsible for removal of refrigerant (British Columbia Ministry of Environment, 2008).

4.2.3 Disposal

Waste refrigerant from vehicles can be disposed of through the Refrigerant Management Canada™ program on a fee basis. This program was set up to safely collect and destroy refrigerant compounds without releasing them into the atmosphere. For more information on the program or for contact information on coordinating disposal of waste refrigerants please contact an RMC Collection Service Provider. Contact information for providers can be found on the Refrigerant Management Canada™ website: http://www.refrigerantmanagement.ca/index.php.

4.3 Waste Fuel

4.3.1 Collection

Waste fuel pertains to fuels such as gasoline and diesel. These fuels should be collected and stored separately in dedicated containers or transferred to other vehicles on-site. Fuels that are still usable (i.e. gasoline that has not gone stale) may be used in on-site vehicles. Stale gasoline cannot be used in vehicles as it may cause damage and must be handled and disposed of as a hazardous waste (British Columbia Ministry of Environment, 2008). Stale gasoline can often be identified by a bad smell caused by degradation of the fuel.

Gasoline can be dangerous as it is flammable and may catch on fire or explode if it comes into contact with a spark or ignition source. Gas should be removed in a well ventilated area and stored outside of the dismantling area. Remove gas using a suction system specifically designed for the removal of gasoline. Do not use a plastic hand pump as this may cause a build up of static electrical charge and may lead to fire or explosion. Do not puncture holes in a tank to drain gasoline or diesel; this may result in leaks or spills (National Code of Practice, 2008 and British Columbia Ministry of Environment, 2008).

Figure 10: Example of Gasoline Collection System

4.3.2 Stockpiling

Usable fuel may be stored in storage containers approved for the specified type of fuel and reused in on-site vehicles. These containers must be kept outside of the dismantling area to prohibit fume build-up and decrease the risk of fire. Stale gasoline and waste fuel must also be stored in approved containers outside of the dismantling area and must be labelled as waste/unusable fuels. Secondary containment should be provided. If stored outdoors, these containers should be protected from rain and snow.

4.3.3 Disposal

Usable fuel should be reused where possible to decrease the amount of waste fuels to be transported offsite. This will decrease shipping and disposal costs. Waste fuels and stale gasoline must be collected and transported off site. The most effective method to transporting out of the community will be by annual barge. These fuels will need to be transported off site by a licensed Transportation of Dangerous Goods shipper. Arrangements will have to be made with the barge company to complete the appropriate manifests and have the approved packaging for transportation offsite. Records of manifests must be kept on-site for a minimum of two years.

4.4 Waste Oils and Fluids

4.4.1 Collection

Waste oils found in ELVs include: engine oil; transmission, power steering, and brake fluids; and differential oil. According to the National Code of Practice (2008), brake, transmission and power steering fluids may be mixed with waste oil. However, based on information from Yukon Environment (2005) and Missouri Department of Natural Resources (1997), brake fluid may sometimes be included, however, due to chlorinated compounds that may be found in some brake fluids, it is recommended that brake fluid not be mixed with waste oils. Please refer to Section 4.5 for further information.

It is recommended that brake fluid be collected with a dedicated pump and stored separately from other oils. Other oils i.e. engine, transmission, power steering and differential can be collected using a common pump and stored in a mixed oil container. Brake fluid should be tested when the container is full to determine chlorinated content and end disposal.

Waste oils can be collected by draining from the vehicle components or by using a hand pump. When draining, use a drip pan to collect the fluids. Once all the fluid has been drained from the component, replace the drain plug, empty the fluid into the designated and marked storage container. For differentials, replace all removed bolts to prevent leakage.

Figure 11: Using Drip Pans to Catch Draining Fluids

When using a hand pump to remove fluids, ensure that each fluid (aside from oils such as engine, transmission, power steering and differential) has a dedicated hand pump. Do not use the same hand pumps for brake fluid, antifreeze, windshield washer fluid, etc. Once all fluid has been drained, empty the container of each pump directly into the designated storage container.

Figure 12: Using Hand Pump

4.4.2 Stockpiling

Waste oil may be stored in steel drums or plastic containers. Both types of containers must have proper fitting lids. These containers may be kept in the dismantling area within a secondary containment unit. According to the British Columbia Ministry of Environment (2008), steel drums are recommended over plastic containers as plastic tends to degrade over time and could potentially cause a leak or spill.

Figure 13: Example of Plastic Container Used for Storage of Waste Oils

Figure 14: Example of Steel Drum Used for Storage of Waste Fluids

4.4.3 Disposal

Waste oil can be disposed of in different ways, however the most appropriate disposal methods for Nunavut include transportation to a recycling facility or used as fuel in a waste oil furnace. Transporting to a recycling facility will involve shipping waste oil out of the community on the annual barge. Hazardous waste/recyclable manifests will need to be completed.

Use of waste oil as a fuel in an approved furnace will eliminate the need to ship waste oil to a southern recycling facility. Waste must only be transported to an approved user/recycler of waste oil.

4.5 Brake Fluid

4.5.1 Collection

Brake fluid may be collected using a hand pump as described for the collection of waste oils. The fluid should then be disposed of into a container designated specifically for brake fluid.

Depending on the end disposal methods of the collected waste oil, brake fluid should not be mixed with waste oil as it may contain chlorinated compounds. Chlorinated compounds when burned in a waste oil burner may cause smoke, fumes or problems with the waste oil burner (Yukon Environment, 2005 and Missouri Department of Natural Resources, 1997). According to the Missouri Department of Natural Resources (1997), brake fluids may contain chlorinated compounds if:

1. An older brake fluid manufactured using chlorinated compounds was used; or,
2. It had become contaminated from brake cleaners that contain chlorinated compounds.

To be sure, the ELV facility operator may want to use a test kit to determine whether or not the used brake fluid contains chlorinated compounds. The facility operator will have to contact the waste oil recycler/disposal company to determine if they will accept waste oil mixed with brake fluid that may contain chlorinated compounds (Missouri Department of Natural Resources, 1997).

4.5.2 Stockpiling

Brake fluid may be stockpiled in approved clearly labelled containers until it can be shipped out by barge. Waste brake fluid should be kept separate from other waste oils unless the ELV facility operator has contacted the recycling/disposal company and has confirmed with them that adding brake fluid to the waste oil is acceptable.

4.5.3 Disposal

Waste brake fluid must be shipped out of the community by annual barge by a licensed Transportation of Dangerous Goods shipper. Brake fluid must be sent to a proper disposal/recycling facility and arrangements with the facility to accept brake fluid must be made prior to shipping.

4.6 Antifreeze

4.6.1 Collection

Antifreeze may be collected by using a hand pump to remove it from the ELV. It must be stored in a clearly marked steel drum or plastic container and must not be mixed with other waste fluids such as oils, windshield washer fluid, brake fluid, etc. Water contaminated by antifreeze must not be put through an oil/water separator as a method of treatment. Oil/water separators do not remove antifreeze from water and if discharged through an oil/water separator the antifreeze may be released into the environment (British Columbia Ministry of Environment, 2008).

4.6.2 Stockpiling

Waste antifreeze must be stored in an appropriate container with a secure lid. Store containers within a secondary containment area that does not have a drain, thereby preventing the release of antifreeze into the environment. Antifreeze that is reusable can be used within other operating vehicles (British Columbia Ministry of Environment, 2008). Unusable antifreeze must be kept separate and stored until it can be shipped out of the community.

4.6.3 Disposal

Antifreeze must not be disposed into the environment as it is toxic and may contaminate the soil and water. It must be stockpiled until it can be shipped to a proper disposal facility. Transportation and manifest records of shipments of waste antifreeze must be kept on-site for a minimum of two years (British Columbia Ministry of Environment, 2008).

4.7 Windshield Washer Fluid

4.7.1 Collection

Windshield washer fluid is a toxic substance that must be drained from all ELVs prior to crushing. Remove washer fluid from ELVs by using a dedicated hand pump and draining the fluid into a dedicated container. Do not mix with other fluids such as engine oil, antifreeze, brake fluid, transmission fluid, etc. Sell or give away reusable washer fluid for use in other operational vehicles.

4.7.2 Stockpiling

Washer fluid must be stored in an appropriate container with a secure lid. Store containers within a secondary containment, area that does not have a drain in order to prevent the release of washer fluid into the environment. Most washer fluid is reusable and can be used within other operating vehicles (British Columbia Ministry of Environment, 2008). Unusable washer fluid must kept separate and stored until it can be shipped out of the community.

4.7.3 Disposal

Waste washer fluid must not be disposed into the environment as it may be toxic. It must be stockpiled until it can be shipped to a proper disposal facility. Transportation and manifest records of shipments of waste fluid must be kept on-site for a minimum of two years.

4.8 Mercury Switches

4.8.1 Collection

The Mercury Switch Out Program is a program that was developed to help automotive recyclers and dismantlers remove and dispose of mercury switches safely from ELVs, when an ELV dismantling facility registers with the program. Clean Air Foundation staff will send to the facility training and educational materials, a collection container for the mercury switches and a pre-paid waybill to send the container back once it is full.

All mercury switches must be removed from ELVs prior to crushing the vehicle hulks. Mercury switches can be found in trunks, hoods, convenience lighting and anti-lock braking systems. Not all vehicles have the same number of mercury switches and not all switches are found in the same locations in each vehicle. The Mercury Switch Out Program website has a number of resources to help ELV facility operators locate mercury switches in various vehicle models and step by step instructions on how to remove these switches. For each convenience light location, the following general steps must be taken:

- Locate the lighting assembly under the vehicle trunk and/or hood.
- Remove any fasteners to separate the entire lighting assembly from the vehicle.
- Break open the lighting assembly to expose the mercury switch capsule (a sealed metal pellet). Small flathead screwdrivers and wire cutters are often the only tools that are required.
- Remove the mercury switch capsule (using a small screwdriver) and place it in the *Switch Out* collection container. Replace the lid on the container. The remaining plastic/metal from the lighting assembly can be disposed of with regular waste.

On vehicles with ABS breaking systems, the following general steps must be taken:

- Locate the ABS G-Force sensor module on the vehicle. Module locations include: the drive tunnel, below the rear seat on the floor pan, on the right front wheel apron, and on the left frame rail right below the driver.
- Remove the ABS G-Force sensor module and place the entire sensor module in the *Switch Out* collection container. Replace the lid on the container. **NOTE:** The ABS G-Force sensor module contains either two or three mercury switch capsules embedded in the casing. Do not attempt to remove the mercury switch capsules from the sensor module.

Please refer to the Mercury Switch Out Program website at http://www.switchout.ca/ for further information.

Figure 15: Example of Removing Light Assembly Containing a Mercury Switch

Figure 16: Mercury Pellet removed from Vehicle Convenience Light

4.8.2 Stockpiling

Once the mercury switches have been removed from each unit, they should be stored in the plastic container provided by the Mercury Switch Out Program. Most of the mercury found in these switches is contained within a metal capsule and therefore the likelihood of a spill is relatively low. However, should a metal capsule break, refer to the Switch Out Clean-Up Instructions located on the Mercury Switch Out Program's website for proper techniques to clean up the spill.

4.8.3 Disposal

Once the container has been filled, use the pre-paid waybill provided by the Mercury Switch Out Program to ship the switches back to the mercury management facility for safe disposal.

4.9 Lead

4.9.1 Collection

Most lead in ELVs comes from wheel weights and battery cable ends. These items must be removed from vehicles prior to crushing and stored in separate, covered strong containers. Lead can be recycled into other usable items (National Code of Practice, 2008 and British Columbia Ministry of Environment, 2008).

4.9.2 Stockpiling

Store lead wheel weights and battery cable ends in separate, covered strong metal or wooden containers.

4.9.3 Disposal

Lead can be recycled into other usable items. The ELV operator will have to contact a metals recycler and make arrangements for them to accept the recovered lead.

4.10 Summary

The following table summarizes information presented in Sections 4.1 to 4.9 of this manual.

Table 2: Summary of Hazardous Materials Management Procedures for ELVs

Type of Material	Collection	Stockpile	Disposal	Comments
Battery	Disconnect terminals and remove from automobile.	Store in leak-proof container. Stack no more than 2 layers.	Recycling in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables.
Refrigerants	To be removed by a certified technician using a mobile refrigerant removal unit.	Store in approved storage containers for refrigerants.	Recycling in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables.
Gasoline or Diesel	Suction system specifically designed for removal of gasoline; Suction system specifically designed for removal of diesel.	Store in approved storage container, outside or in a well ventilated area.	Reuse "good" fuel in operable vehicles. Dispose of stale fuel to a facility in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Engine Oil Transmission Oil Power Steering Oil Differential Oil	Use hand pump or drain from vehicle components.	Store mixed together in steel drums or plastic containers.	Recycling in southern Canada or for use in a certified waste oil furnace.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Brake Fluid	Use dedicated hand pump to remove from vehicle.	Store separately in steel drum or plastic container.	Disposal in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Antifreeze	Use dedicated hand pump to remove from vehicle.	Store separately in steel drum or plastic container.	Reuse "good" antifreeze in operational vehicles. Dispose of waste antifreeze to a facility in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Windshield Washer Fluid	Use dedicated hand pump to remove from vehicle.	Store separately in steel drum or plastic container.	Reuse "good" washer fluid in operational vehicles. Dispose of waste washer fluid to a facility in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables/wastes.
Mercury Switches	Use small flathead screwdrivers and wire cutters to remove assemblies from vehicles. Remove metal mercury pellet from assembly.	Store in designated mercury switch collection container provided by the Mercury Switch Out Program.	Use waybill provided by the Mercury Switch Out Program to ship to mercury management facility.	Must be labelled, packaged and manifested as hazardous wastes.
Lead Wheel Weights	Remove battery cable ends and wheel weights from vehicles.	Store in separate covered, strong metal or wooden containers.	Recycling in southern Canada.	Must be labelled, packaged and manifested as hazardous recyclables.

5 APPLIANCES

Appliances contain hazardous materials that must be removed prior to stockpiling and crushing at a solid waste site. As removal and disposal techniques of refrigerants and mercury switches from appliances is similar to those used for ELVs, it may be beneficial to have these items removed from appliances during the processing of ELVs. This is especially true if a certified refrigerant removal technician must be brought into the community to remove the refrigerants from ELVs. The following sections describe the various types of hazardous materials, where to find them and how to remove them from appliances.

5.1 Refrigerants

5.1.1 Collection

Refrigerants are found in refrigerators, freezers, window air conditioners and dehumidifiers. Refrigerants must be removed in a similar manner to the process described for ELVs. Removal of refrigerants must be performed only by a certified technician. Technicians must use an approved portable refrigerant recovery unit and follow approved procedures for removal of refrigerants from appliances. Venting of refrigerant into the atmosphere is unacceptable (Environment Canada, 2010).

Appliance dismantlers should also be aware that oil found in the appliance compressors may be contaminated with refrigerants. A certified refrigerant removal technician should be able to safely remove and dispose of refrigerants in the oil and the contaminated compressor oil (Environment Canada, 2010).

5.1.2 Stockpiling

Recovered refrigerant must be stored in an approved storage container for the transport of refrigerant materials. Different refrigerants should not be mixed and refrigerant containers that held one type of refrigerant should not be used to hold another type (Environment Canada, 2010). The refrigerant recovery technician must be knowledgeable of which containers are approved for the collection and transport of recovered refrigerant. Technicians must also keep a record of what type and how much refrigerant was removed. Storage containers must be labelled appropriately for transport.

5.1.3 Disposal

Waste refrigerant from appliances can be disposed of through the Refrigerant Management Canada™ program on a fee basis. This program was set up to safely collect and destroy refrigerant compounds without releasing them into the atmosphere. For more information on the program or for contact information on coordinating disposal of waste refrigerants please contact an RMC Collection Service Provider. Contact information for providers can be found on the Refrigerant Management Canada™ website: http://www.refrigerantmanagement.ca/index.php.

5.2 Mercury Switches

5.2.1 Collection

Mercury switches may be found in a variety of appliances, generally those that have automatic shut-off features and/or convenience lighting. These appliances may include freezers, washing machines, gas ranges, gas hot water heaters, gas furnaces, sump pumps, etc. However, these mercury switches do not look the same as those found in vehicles and therefore caution must be taken when identifying and retrieving switches from appliances. The Vermont Department of Environmental Conservation in conjunction with the Vermont Mercury Education & Reduction Campaign and Chittenden Solid Waste District have developed a manual titled *Household Appliance Mercury Switch Removal Manual*. A copy of this manual has been included as an appendix to this guideline or alternatively can be found on the following website: http://www.mercvt.org/PDF/appman.pdf.

Figure 17: Assorted Mercury Freezer Switches for Disposal

(Source: Vermont Department of Environmental Conservation, Vermont Mercury Education & Reduction Campaign, Chittenden Solid Waste District, 2002)

Figure 18: Chest Freezer Light with an Inline Mercury Switch (Glass Ampule)

(Source: Vermont Department of Environmental Conservation et al., 2002)

Figure 19: Washing Machine Mercury Switch

(Source: Vermont Department of Environmental Conservation et al., 2002)

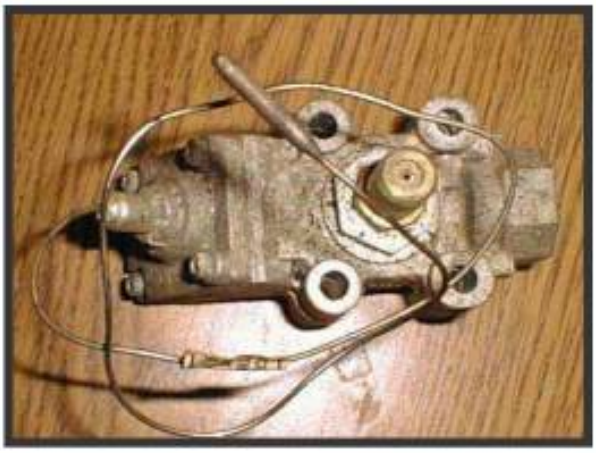

Figure 20: Gas Safety Valve Control, Gas Safety Valve Capillary Tube and Safety Valve Sensor Bulb from Gas Range

(Source: Vermont Department of Environmental Conservation et al., 2002)

Figure 21: Sump Pump Float Containing Mercury

(Source: Vermont Department of Environmental Conservation et al., 2002)

5.2.2 Stockpiling

Once mercury containing units have been removed, they should be stored in a heavy plastic container with a proper fitting lid. Containers must be in good condition and must not leak. It is advisable not to use an aluminum or tin container as mercury may react with these metals and may leak through the container. Container contents must be marked on the outside of the container and containers must be stored in a dry location where they will not be disturbed (California Environmental Protection Agency, 2005).

5.2.3 Disposal

Summerhill, the company which operates the Mercury Switch-Out Program for ELVs, in conjunction with the Canadian Appliance Manufacturers Association, is currently working on developing a similar program for the collection of mercury switches from appliances. Information regarding this program can be found by contacting the Summerhill Impact group or on the following website:

http://www.summerhillgroup.ca/eng/impact/programs/appliance-switches.php.

5.3 Ballasts

5.3.1 Collection

Ballasts are components generally found in fluorescent lighting fixtures and high intensity discharge (HID) lamps. In fluorescent lighting fixtures, the ballasts are usually found between two fluorescent tubes and protected by a heat shield. HID ballasts are generally found encased within a box attached to the outside of the light fixture or located within the light housing. Examples of HID lamps include streetlights and parking garage lights (Environment Canada, 1991).

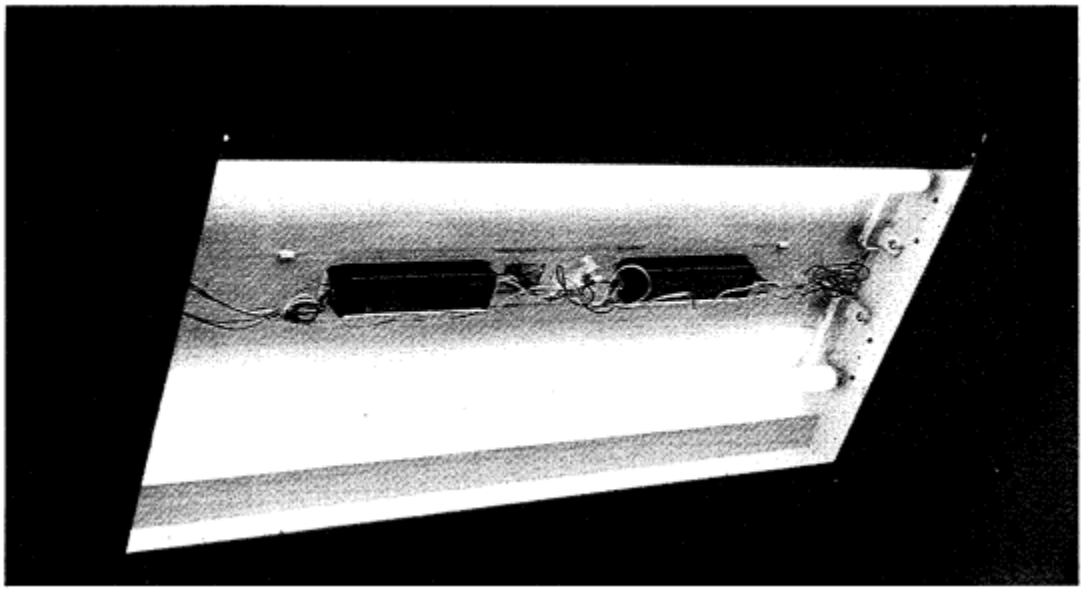

Figure 22: Fluorescent Lamp Unit with Exposed Lamp Ballasts

(Source: Environment Canada, 1991)

It should be noted that fluorescent lights found in appliances such as stoves may contain ballasts that may have PCB material within them. Unless ballasts are identified as “PCB free”, these items should be removed and properly disposed of as hazardous waste.

Fluorescent ballasts contain a core/coil unit, a thermal protector and a capacitor. The capacitor may contain PCBs. It is the PCBs that are of concern as they may pose a risk to human and environmental health. These ballasts may also be filled with an asphalt/silica type compound. If the ballast contains this compound, the capacitor within the ballast will not be readily accessible. Therefore, it is important that the entire ballast unit is removed and disposed of through a proper hazardous waste disposal company. HID ballasts usually require higher levels of capacitance than fluorescent ballasts. Therefore, they often contain more capacitors and hence may contain more PCBs than fluorescent light ballasts (Environment Canada, 1991).

In the late 1970's to early 1980's, many companies began phasing out the use of PCBs in capacitors. However, there are still ballasts with capacitors in use today that may contain PCBs and therefore caution must be taken when removing and disposing of ballasts. In order to determine if a ballast contains PCBs, the manufacturer of the ballast should be contacted. The manufacturer should be able to determine whether the ballast contains PCBs based on the date codes and/or catalogue codes on the ballast casing (Environment Canada, 1991). Many manufacturers also began labelling non-PCB containing electrical equipment to aid in proper handling. Equipment labelled as "PCB-free" of "Non PCB" does not require removal. The recycler should mark each appliance as inspected and cleared as appropriate.

Caution must be taken when removing ballasts. The fixture must be de-energized prior to removal of the ballast and must not be re-energized during the removal. Capacitors may also hold a charge for several days after their last use and therefore there is a risk of electric shock to persons removing capacitors. As there is a possibility of PCBs leaking from the ballast, goggles and acid resistant gloves must be worn when removing and handling the ballast (Connecticut Department of Environmental Protection, 2005).

It should be noted that fluorescent lamp tubes contain mercury phosphor powder, lead and cadmium and must not be disposed of in the general waste stream. They must be disposed of through an approved hazardous waste recycler and/or disposal company. If the tubes are not broken, they may be packaged in their original packaging and sent to an approved facility with no further special transportation requirements. However, if the tubes are broken, special safety, handling, packaging and transportation requirements must be met. Safety procedures are of utmost importance to prevent worker exposure to mercury. In the case of disposing of a broken fluorescent tube, contact a Safety Officer at the Prevention Services Division, Workers Compensation Board in Iqaluit at (867) 979-8500 or 1-877-404-4407 (Environmental Protection Service, 2003).

5.3.2 Stockpiling

The PCB Regulations (published in the Canada Gazette, 2008) under the Canadian Environmental Protection Act, 1999 states in paragraph 24:

"PCBs or products containing PCBs shall be stored at a site that is

(a) a building, room, shipping container or other enclosed structure; or

(b) an area that is enclosed by a woven mesh wire fence or any other fence or wall with similar security characteristics, and the fence or wall shall be at least 1.83 m high."

The PCB Regulations go on to state in paragraph 25:

"The owner or operator of a PCB storage site shall

(a) store all PCBs or products containing PCBs that are in liquid form in

(i) sealed containers, other than drums, that are made of steel or other metals that provide sufficient durability and strength to prevent those PCBs or products from being affected by the weather or released, or

(ii) drums that are

(A) of a capacity not greater than 205 L,

(B) a closed-head double-bung drum made of steel having a gauge of 16 or heavier, and

(C) painted or treated to prevent rusting;

(b) store all PCBs or products containing PCBs that are in solid form in

(i) containers, other than drums, that are made of steel or other materials that provide sufficient durability and strength to prevent those PCBs or products from being affected by the weather or released, or

(ii) drums that are

(A) of a capacity not greater than 205 L,

(B) made of steel having a gauge of 18 or heavier,

(C) equipped with a securely attached, removable steel lid and a gasket made of material that is resistant to the PCBs or the products containing PCBs that are stored in the drums, and

(D) painted or treated to prevent rusting;

(c) store equipment containing PCB liquids in

(ii) containers, other than drums, that are made of steel or other materials that provide sufficient durability and strength to prevent the equipment from being affected by the weather and to prevent any PCB liquid that leaks from the equipment from being released, or

(iii) drums described in subparagraph (b)(ii);"

Paragraph 25 goes on to list the storage space requirements for the above described containers. A copy of the PCB Regulations has been included as an appendix to this manual. Please refer to this document for further proper storage, handling and documentation information and requirements.

5.3.3 Disposal

As previously stated, ballasts containing hazardous materials must be sent to an approved hazardous waste disposal facility. PCB Disposal (a division of Sanexen Environmental Services Inc.) is a company located in Ontario that will accept and dispose of PCB containing ballasts. They have also published a document to help identify ballasts that may contain PCBs. Further information regarding this company can be found on the website at: http://www.pcbdisposalinc.com/.

5.4 Capacitors

5.4.1 Collection

Capacitors found in household appliances are predominantly labelled as either 'oil-filled' or 'dry'. Oil-filled capacitors are often referred to as running capacitors. Running capacitors are generally used in applications where they are required to be in use during the entire operating time. As they are constantly in use, heat builds up within the capacitor. The oil contained within the capacitor helps to dissipate this heat. Oil-filled capacitors manufactured prior to the late 1970's and early 1980's may contain PCB compounds within the oil. In order to determine if the capacitor contains PCB material, contact the manufacturer and provide the date and/or catalogue code located on the capacitor casing. Some capacitors may be stamped with "NO PCBs" on the casing. In this case, the capacitor does not contain PCBs. Appliances that most likely contain oil-filled capacitors include air conditioners, copy machines, microwave ovens, mercury vapour lamps, dehumidifiers and submersible well pumps. Capacitors in microwaves can be found behind the front control panel and wired to the transformer (Connecticut Department of Environmental Protection, 2005).

Be aware that oil-filled space or portable heaters may not contain a PCB capacitor, however, PCBs may be found within the actual oil. Although most oil-filled space heaters do not contain PCBs, those that do may have very high concentrations of PCBs. It is recommended that any of these types of heaters be tested for the presence of PCBs prior to crushing or disposal (Connecticut Department of Environmental Protection, 2005).

Dry capacitors are generally known as starting capacitors as they are used to start a motor during the initial start up. Once the motor is running, they are no longer needed and so are not used during the entire motor operation. Because these capacitors are only used for short periods of time, they do not produce much heat and therefore do not require oil for heat dissipation. Starting capacitors are usually identified by a non-sealed black casing or outer shell. Starting capacitors are generally found in clothes dryers, fans, refrigerators, stoves, televisions, washing machines and various electronic equipment. These capacitors are not known to contain PCB materials and so are not required to be handled as hazardous waste material.

5.4.2 Stockpiling

Capacitors containing PCBs should be stockpiled as outlined in Section 5.3.2 of this manual.

It is important to keep ballasts and capacitors containing PCBs away from fire hazards. Fire may cause these items to explode and release PCBs into the environment.

5.4.3 Disposal

Capacitors containing PCBs should be disposed of as outlined in Section 5.3.3 of this manual.

6 HEALTH AND SAFETY

6.1 Worker and Public Safety

As ELV dismantling operations deal with a number of hazardous substances, employee and public safety are very important. Employers must ensure that their employees are trained in safe work practices for the facility. This may include but not be limited to special handling and storage requirements of hazardous materials, WHMIS, first aid, emergency procedures, etc. Employers must also provide employees with the necessary personal protective equipment (PPE) to complete their jobs in a safe manner. PPE and safety items that should be maintained on-site include:

- Approved safety boots (steel toe)
- Eye goggles
- Gloves
- Eye wash station
- First aid kit
- Fire extinguisher as approved by the Fire Marshall
- Work coveralls.

Workers should also remove items from vehicles in the following order to prevent injury and environmental damage:

- Remove the battery first to de-energize the vehicle.
- Remove refrigerants to prevent accidental release into the environment.
- Remove gasoline in a well ventilated area to prevent the build up of fumes and decrease the risk of fire or explosion.
- Remove other hazardous materials.

Public safety must also be taken into consideration when operating an ELV dismantling facility. All hazardous items must be kept in a secure location and away from public access. At the completion of each day, the site should be secured to prevent access.

6.2 Environmental Health and Safety

With the collection and storage of hazardous materials on-site, there is the potential for environmental contamination to occur. The following best practices should be used in order to mitigate potential spills and contamination (National Code of Practice, 2008 and British Columbia Ministry of Environment, 2008):

- Store all hazardous materials in approved containers with securely fitting lids.
- All containers holding hazardous materials should be placed within a secondary containment area.
- Remove gasoline outside of the dismantling area in a well ventilated area.
- Remove refrigerants after the battery has been removed, but before removal of any other fluids or parts to prevent accidental discharge into the environment.
- Drip pans must be used at all times to catch fluids dripping from vehicles and to prevent spills.
- The dismantling area should have an adequate roof and concrete floor pad for easy clean up of spills and to prevent soil contamination. An alternate for smaller/temporary locations is to undertake work outdoors in dry warm weather only upon an impermeable working surface. The constructed temporary vehicle fluid recovery area should consist of, for example, a protective sand layer/poly liner/sand layer covered with a plywood working surface.
- Ensure water runoff does not flow through areas containing hazardous wastes.
- Spill kits should be available on-site.
- Ensure there is lime or bicarbonate of soda on hand to neutralize spilled battery acid.
- Dispose of all used spill cleanup material as hazardous wastes.

In order to follow the above best practices, the following equipment should be kept on hand (Minnesota Pollution Control Agency, 2002):

- Fire extinguishers should be available in all facility buildings. Please contact the Fire Marshal for specific type of fire extinguisher and code requirements.
- Safety equipment such as rubber or latex gloves and safety goggles.
- Absorbent materials such as rags, towels, sawdust, etc.
- Containers to hold spilled waste and used absorbent materials.
- Shovels and/or scoops.
- Industrial spill clean-up products tailored for the clean up of oils and solvents may want to be used. This will be dependent on the operation of the facility and will have to be determined whether purchase of these items is warranted.

7 COST RECOVERY

Due to the location of many communities in Nunavut, transportation of vehicle hulks and associated hazardous materials to proper recycling and disposal facilities can be quite expensive. However, there are a few items that can be salvaged from ELVs, in advance of crushing, that may be sold to recyclers to help cover some of the related disposal costs. Recovery costs of these items will be dependent on the market value of the materials at the time of sale. These items may include:

- Catalytic converters (contains several precious metals)
- Aluminum wheels
- Fuel
- Windshield washer fluid
- Antifreeze
- Waste oil

Unfortunately, sales of these items will likely not cover the entire cost of the program. Funding will have to be supplemented to complete the entire cycle of dismantling and disposal.

8 REFERENCES

Documents Referenced

Automobile Recyclers of Canada. (2008). *National Code of Practice for Automotive Recyclers Participating in the National Vehicle Scrappage Program*. Created for Environment Canada. Retrieved June 11, 2010 from:

http://www.certifiedautorecycler.ca/Downloads/COM624_Automotive_Recylers_ENG_web.pdf

British Columbia Ministry of Environment. (2008). *Guidebook for the Vehicle Dismantling and Recycling Industry Environmental Planning Regulation*. Retrieved June 25, 2010 from:

http://www.env.gov.bc.ca/epd/industrial/regs/vehicle/pdf/guidebook_vehicle_reg.pdf

California Environmental Protection Agency. (2005). *How to Remove Mercury Switches from Major Appliances – A Guide for Appliance Recyclers*. Retrieved December 21, 2010 from:

http://www.dtsc.ca.gov/HazardousWaste/Mercury/upload/HWMP_POL_Guidance_Mercury_Appliances.pdf

Canadian Environmental Protection Act, 1999. (2008). *PCB Regulations*. Published in the Canada Gazette Part II, Vol. 142, No. 19 (SOR/2008-247 to 290 and SI/2008-93 to 107).

Connecticut Department of Environmental Protection. (2005). *Guide for Removal, Storage, and Disposal of PCB Small Capacitors*. Retrieved December 22, 2010 from: http://www.ct.gov/dep/cwp/view.asp?a=2710&depNav_GID=1638&q=324258

Department of Environment, Government of Nunavut. (2006). *Management Options for End-of-Life Vehicles (ELVs) in Nunavut*. Iqaluit, Nunavut.

Department of Sustainable Development, Government of Nunavut. (2002). *Environmental Guideline for Ozone Depleting Substances*. Retrieved July 2, 2010 from: http://www.gov.nu.ca/env/depleting.pdf

Department of Sustainable Development, Government of Nunavut. (2002). *Environmental Guideline for Waste Batteries*. Retrieved July 1, 2010 from:

http://www.gov.nu.ca/env/batteries.pdf

Environment Canada. (2010). *Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems*. Retrieved December 13, 2010 from:

http://www.ec.gc.ca/ozone/default.asp?lang=En&n=127A4F77-1&offset=1&toc=show

Environment Canada. (1991). *Environmental Protection Series – Identification of Lamp Ballasts Containing PCBs*. Retrieved December 21, 2010 from:

http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=F1D91988-3B5E-4956-A705-78D054685FFE

Environmental Protection Service, Department of Environment, Government of Nunavut. (2003). *Disposal Guidelines for Fluorescent Lamp Tubes*. Retrieved December 22, 2010 from:

http://env.gov.nu.ca/sites/default/files/Fluorescent%20Lamp%20Tubes.pdf

Minnesota Pollution Control Agency. (2002). *Motor Vehicle Salvage Facility Environmental Compliance Manual*. Retrieved July 9, 2010 from:

http://www.smallbiz-enviroweb.org/industry/scrapmetal.aspx

Missouri Department of Natural Resources. (1997). *Preventing Pollution in the Vehicle Maintenance Industry - #6: Brake Fluid*. Retrieved July 1, 2010 from:

http://www.p2pays.org/ref/15/14866.pdf

North Central Development. (2006). *Scrap Metal Recycling in Remote Northern Communities – A Pilot Implementation Project – Final Report.* Prepared for: Action Plan 2000 in Climate Change, Minerals and Metal Program, Enhanced Recycling; Managed by Natural Resources Canada.

Refrigerant Management Canada™. (2010). Retrieved July 2, 2010 from:

http://www.refrigerantmanagement.ca/index.php

Summerhill Impact. (2010). Retrieved June 11, 2010 from:

http://www.switchout.ca/

Vermont Department of Environmental Conservation, Vermont Mercury Education & Reduction Campaign, and Chittenden Solid Waste District Comprehensive Waste Management. (2002). *Household Appliance Mercury Switch Removal Manual*. Retrieved December 2010 from:

http://www.mercvt.org/PDF/appman.pdf

VT Solid Waste Districts and Alliances, VT Department of Environmental Conservation, Environmental Assistance Division. (2002). *Best Management Practices (BMP) for Vermont's Auto Salvage Yards*. Retrieved July 9, 2010 from:

http://www.cwwa.ca/pdf_files/Source%20Control%20-%20Vermont%20Scrap.pdf

Yukon Environment. (2005). *Environmental Programs: Guide for Used Oil Burner Operators*. Retrieved July 1, 2010 from:

http://environmentyukon.gov.yk.ca/monitoringenvironment/EnvironmentActandRegulations/documents/sw13_used_oil_burners.pdf

Personal Communication Referenced

Shawn Hnatuik, Owner of Day Auto in Winnipeg, Manitoba. Personal communication and site visit to Day Auto on June 17, 2010.

James Dart, Account Manager and K.W. (Kurtis) Calder, Environmental Officer, Gerdau Ameristeel in Selkirk, Manitoba. Personal communication and site visit to Gerdau Ameristeel metal recycling facility on June 17, 2010.

Sebastian M.H. Lau, Manager – Environment Quality & Safety, General Scrap in Winnipeg, Manitoba. Personal communication and site visit to Buck's Auto on June 17, 2010.

APPENDIX A

Household Appliance Mercury Switch Removal Manual

HOUSEHOLD APPLIANCE MERCURY SWITCH REMOVAL MANUAL

SPRING 2002

PRODUCED BY:

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MERCURY EDUCATION & REDUCTION CAMPAIGN • MERC • VERMONT •

CHITTENDEN SOLID WASTE DISTRICT

CSWD

Comprehensive Waste Management

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This document is available on the Internet at:

TABLE OF CONTENTS

1.0 INTRODUCTION

Mercury (Hg) is one of the most widespread, persistent and toxic contaminants in our environment. Its incorporation into many products and its emission from combustion processes has resulted in well documented instances of population poisonings, high level occupational exposures, and worldwide, chronic, low-level environmental exposures. About two-thirds of the mercury in the atmosphere comes from human sources such as coal burning power plants and incinerators, and one-third from natural sources such as volcanoes and forest fires. The amount of mercury flowing into our lakes is between two and four times what flowed into them 100 years ago[8].

In the environment, mercury is found in various forms and complexes. Atmospheric mercury mixes with rain and snow and falls into lakes, rivers and watersheds. Once mercury enters a waterway, natural processes convert a small proportion of it to methyl mercury. Methyl mercury, one organic form of mercury, can accumulate up the food chain in lakes, ponds and reservoirs which results in high concentrations in predatory fish.

When certain mercury-tainted fish are consumed by humans, the levels of mercury can impair development of the nervous system in the fetus and in young children, affecting sensory, motor and cognitive functions, and resulting in such problems as difficulty in learning to read and inability to concentrate. Vermont's relatively pristine waters have not been spared from this regional and global problem. In addition to fish consumption advisories that recommend limiting consumption of certain fish in certain bodies of water, recent studies have shown that 12 percent of Vermont's lakes have sufficient mercury in their food chains to put common loons at considerable risk of toxic effects.

In order to prevent the continued release and build-up of mercury (in all forms) in the environment, many states including Vermont are currently working towards eliminating major sources of mercury releases. The Governors of the New England States and the Premiers of the Eastern Canadian Provinces have endorsed a regional goal of "the virtual elimination of the discharge of mercury into the environment" from man-made sources. Vermont has addressed mercury elimination through its Mercury Education and Reduction Campaign (MERC), which has included thermometer exchanges, school clean-outs, retailer and contractor mailings, dairy manometer exchanges, pharmacy pledges and various other outreach efforts to remove mercury from the solid waste stream.

One of Vermont's other efforts is the removal of mercury from discarded household appliances or "white goods". Many of these white goods, which are currently being collected for their scrap metal value, contain mercury switches and thermocouples. Mercury was used in household appliances due to it being a highly reliable means for electrical switching in varied temperature and moisture conditions[4].

When "white goods" are processed for scrap metal, mercury may be released to the environment. In fact, when white goods are processed (shredded) for scrap metal, there are three distinct by-products. These are classified into ferrous, non-ferrous metallic and nonmetallic components[1]. It is the "fluff" or non-metallic components that many of the hazardous constituents in household appliances adhere to, including mercury[2]. These hazardous components are then available to be released either through smokestack emissions at smelters, incinerators or through landfill leachate from intact products or ash from their incineration[1]. The diagram on the following page details how mercury cycles through the environment.

How Does Mercury Get Into Fish?

Once in a lake or river, mercury is converted to methylmercury by bacteria and other processes. Fish absorb methylmercury from their food and from water as it passes over their gills. Mercury is tightly bound to proteins in all fish tissue, including muscle. **There is no method of cooking or cleaning fish that will reduce the amount of mercury in a meal.**

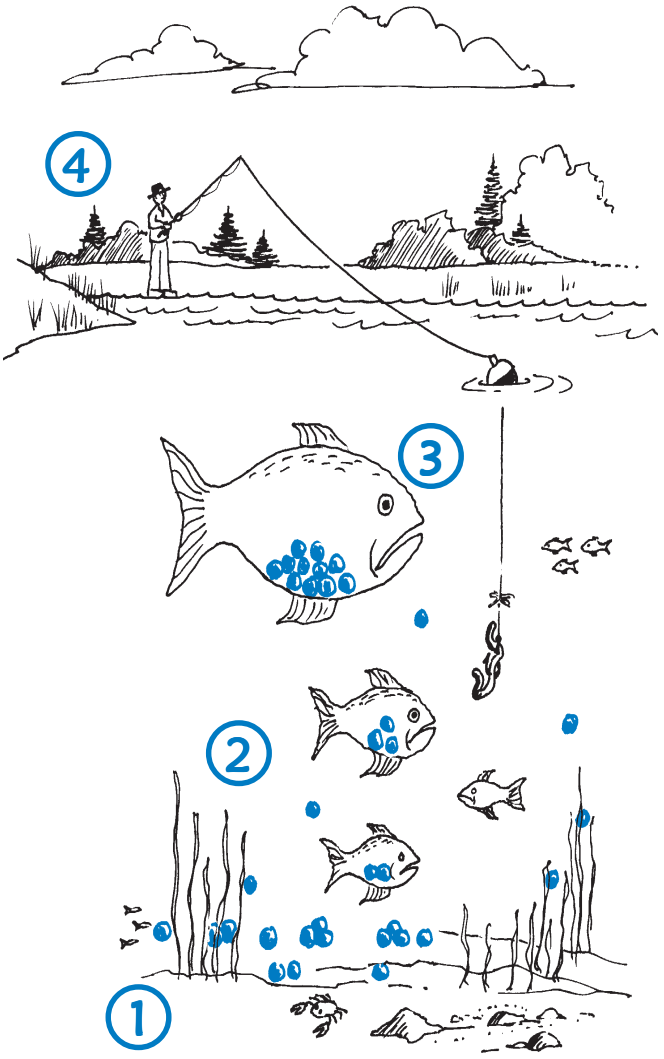
Methylmercury accumulates as you move up the food chain:

1. Methylmercury in the water and sediment is taken up by tiny animals and plants known as plankton.

2. Small fishes eat large quantities of plankton over time.

3. Large predatory fish consume many smaller fish, accumulating methylmercury in their tissues. The older and larger the fish, the greater the potential for high mercury levels in their bodies.

4. Fish are caught and eaten by humans and animals, causing methylmercury to accumulate in their tissues.



= represents methylmercury

The State of Vermont Fish Contaminant Monitoring Program has been monitoring the levels of mercury in fish tissue since 1987. Measureable concentrations have been observed in 95% of the samples collected from lakes and rivers across the state. The highest amounts of mercury are generally found in older fish of species which consume other fishes. The species which contain the greatest amounts of mercury are walleye from Lake Champlain, smallmouth bass, and chain pickerel. The lowest mercury levels are found in pumpkinseed sunfish, brown bullhead, and brook trout from streams. The Vermont Department of Health has issued a fish consumption advisory which recommends that fewer meals be consumed of species with greater than average mercury levels. The advisory is also more protective of women of child-bearing age and children under age 7. For more information on consumption advisories call the Department of Health toll-free at 1-800-439-8550.

The purpose of this manual is to address the removal of mercury switches and thermocouples prior to appliances being processed for their scrap metal. By educating individuals on how to remove mercury prior to metal reclamation, we all can help manage mercury wastes properly and keep mercury out of the environment.

2.0 REGULATORY BACKGROUND

Mercury is an environmental concern because it is a heavy metal that can accumulate in living tissues and cause adverse health effects. When a mercury containing device is disposed of in a landfill or incinerator, the mercury in it can escape to contaminate air, soil, surface water and ground water. For a number of years, the Vermont Department of Health has issued health advisories warning people to limit consumption of freshwater fish caught in Vermont due to elevated levels of mercury in some fish species. When mercury is spilled in the home or workplace, the silvery liquid metal can evaporate and be breathed in by everyone in the building. Mercury affects the human brain, spinal cord, kidneys and liver. It affects the ability to feel, see, taste and move. Long term exposure can result in symptoms that get progressively worse and lead to personality changes, stupor and coma.

Mercury is intentionally added to many familiar products. Some of these include:

- flourescent and high intensity discharge (HID) lights
- certain types of thermometers and thermostats
- heat sensors for gas pilot lights
- tilt switches in automobiles and appliances
- silent wall switches and electric relays
- vacuum gauges, barometers and manometers

For the last 20 years, mercury-containing waste from business, industry and institutions has been considered a hazardous waste because it often fails standard EPA toxicity test limits. More recently, a less restrictive waste handling option has been added to both state and federal hazardous waste regulations for certain mercury-containing wastes. These wastes are called “Universal Wastes” because they are equally likely to come from either regulated or unregulated sources. Only thermostats and hazardous waste (mercury-containing) lamps are currently listed as Universal Wastes. Wastes that are listed as “Universal Wastes” have reduced requirements for reporting, handling and storage (See Vermont Hazardous Waste Management Regulations, Subchapter 9, *Universal Waste Management Standards* for more information.). By having less restrictions on mercury-added product management, proper management can be easily facilitated.

The Vermont Agency of Natural resources is in the process of revising its “Universal Waste” rule to include all categories of mercury-added products. In the interim, to facilitate removal of as many of these products as possible from the solid waste stream and promote proper management of the collected mercury, these waste materials may be handled under existing provisions of the Vermont Hazardous Waste Management Regulations (See Subchapter 9, *Universal Waste Management Standards*) in the same manner as “Universal Waste Thermostats”.

In 1998, the Vermont legislature passed a bill to decrease the amount of mercury in the State’s solid waste. Under one provision of the bill, labeled mercury-added products are required to be separated

from the trash and are banned from landfill disposal. After March 1, 2000, all mercury-added products are required to be labeled under Vermont Law. Municipalities and Solid Waste Districts are required to provide collection programs for these materials. The Vermont law applies equally to households, farms, businesses and industries. The following mercury-added products are banned from landfill disposal and/or are required to be labeled in Vermont:

- thermostats or thermometers
- switches individually or part of other products
- medical or scientific instruments
- electric relays or other electric devices
- lamps
- batteries, other than button cells

HOW TO USE THIS MANUAL

This manual covers:

- the purpose of mercury in particular appliances
- its location and use
- how to safely and properly remove it
- how to safely store mercury-added products
- the proper methods of disposal or recycling
- mercury spill clean-up
- lists of hazardous waste transporters, mercury recyclers and spill clean-up firms

Since we are constantly discovering additional products with mercury-added components, this manual remains a work in progress. Please let us know of any additional products that you feel should be added to this manual.

3.0 HOUSEHOLD APPLIANCE MERCURY REMOVAL

Safety Note: Proper personal protective equipment should be used at all times (i.e, safety glasses, gloves, tyvek suit and in the event of a spill a respirator and mercury cartridges). In addition, spill equipment and storage material should be on-hand prior to any mercury-added device removal.

All appliances should be unplugged from an electrical outlet prior to any mercury switch removal. Appliances that have had these devices removed should be disabled to prevent future use (i.e, cut the electrical cord, or disable the gas feed line). All appliances that have had their mercury switches removed should be handled as scrap metal for recycling (not to be reused as a home appliance). All other hazardous components must be properly removed and disposed of (including but not limited to chlorofluorocarbons (CFCs) and polychlorinated biphenyls (PCBs) prior to scrap metal recycling.

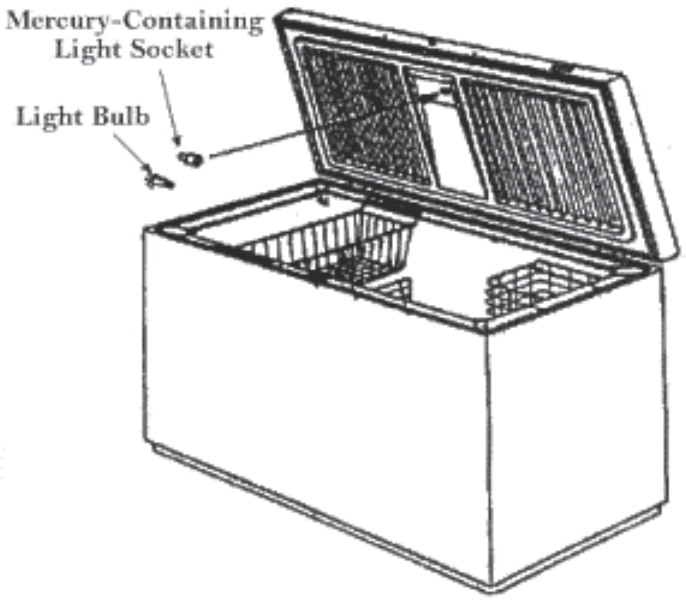
In case a switch breaks during the removal process, please follow the mercury spill clean-up instructions on page 20.

Note: Once these mercury-added products are removed, proper handling, storage and disposal are described on page 19 and in Appendix E.

3.1 Chest Freezers

Some chest freezers are made with a mercury switch inside the freezer cover light socket (see Figure below). The mercury engages two contact points when the lid is opened thus completing the electrical circuit and turning on the light. All freezer manufacturers have stopped using mercury as a switching mechanism and begun using a mechanical switch by January 1, 2000. If there is no visible push button switch mechanism, the freezer is likely to have a lid mercury tilt switch[3].

Chest Freezer with Mercury-Containing Light Socket.



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The following procedure should be used for removal of the mercury tilt switch.

CHEST FREEZER MERCURY SWITCH REMOVAL

ESTIMATED REMOVAL TIME: 1-5 MINUTES

STEP 1.
Open the freezer lid and look for a manual switch, similar to the one shown above. If it has a manual switch, the appliance can be handled as scrap metal (after removal of CFCs).

If there is no manual switch, proceed to **STEP 2.**

STEP 2.
Locate the light socket on the underside of the lid (on some freezers you may have to remove a plastic light cover).

STEP 3.
Remove the light bulb and properly discard.

STEP 4.
Remove the plastic housing (either by unscrewing it or breaking it off).

STEP 5.
Gently pull the light socket out of its mounting bracket (due to some lights having an in line mercury switch see Reference Photo 2 below).

STEP 6.
Cut or remove the attached wires.

STEP 7.
Remove and properly dispose of the entire light socket.

REFERENCE PHOTO 1.
Assorted mercury freezer switches for disposal.

REFERENCE PHOTO 2.
Chest freezer light with an inline mercury switch (glass ampule).

3.2 Washing Machines

Mercury switches were used in a small number of washing machines manufactured prior to 1972 because of their ability to reliably function in a high-moisture environment. Most washing machines with mercury switches will have passed through the recycling stream by 2010. Mercury switches were used for two different applications in washing machines, both of these uses were for consumer protection.

One application of the mercury switch was used to detect a lid opening and engage a brake to quickly stop the washer drum from moving. This feature is particularly important when the washer is in a spin cycle because it reduces the risk of a consumer being injured by reaching into a spinning basket. This switch is located between the washer tub and the cover for the tub area of the washer and is activated when the lid of the washer is lifted.

Another use for mercury switches in washing machines was in the dynamic stabilizing system to prevent a severe out-of-balance condition (only on certain models). This switch worked by breaking the circuit when the washing machine was severely out of balance. This switch is located on the back of certain washing machine models and is activated when the washing machine is severely out of balance.

These switches can be identified and removed using the following procedures.

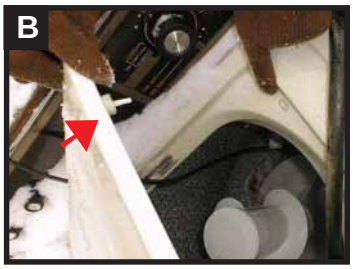
WASHING MACHINE MERCURY SWITCH REMOVAL

ESTIMATED REMOVAL TIME: 5-10 MINUTES

STEP 1.
Open the lid on the washer and look for a non-mercury mechanical switch. These switches come in various sizes, shapes and locations. You should also be able to hear an audible “click” when a mechanical switch engages and disengages (with the opening and closing of the lid). If there is no mechanical switch continue to STEP 2. Photos A and B are examples of non-mercury mechanical switches.

Non-mercury mechanical switch examples:

A) back tab switch



B) front tab switch.

Once you have determined that there is no mechanical switch, the following procedure can be used to remove the mercury switch.

STEP 2.
Pry off the top of the washing machine as shown in figure a. or remove any fasteners from the lid as shown in figure b.