GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Conservation

Newfoundland Labrador

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GUIDANCE DOCUMENT

Title: **General Environmental Standards**
Municipal Solid Waste Management Facilities / Systems

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Derrick Maddocks, Director

General Environmental Standards
For MSW Management Facilities

GD-PPD- 063.3

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A full list of Waste Management Guidance Documents is available on the Department's website http://www.env.gov.nl.ca/env/env_protection/waste/index.html#wmsgd .

References ..... as per the guidance document specific to facility type

List of Appendices (posted as separate documents on the Departmental website)

Appendix A Financial Assurance and Insurance Requirements
Appendix B Typical Quality Control / Quality Assurance Program (for MSW landfills)
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Please refer to the MMSB website http://www.mmsb.nf.ca for an up to date listing of Regional Service Boards and Waste Management Boards; and links for further recycling information.

1.0 Purpose

This document provides a consolidation and general overview of standards applicable to all municipal solid waste (MSW) management facilities/ systems that are part of the provincial Waste Management Strategy, as revised in May 2007. If several types of facilities are constructed as part of a regional system/site, the requirements for environmental baseline and monitoring would apply to the site. Potential impacts specific to the operation of each facility (e.g. landfill or compost facility) would also be monitored.

Environmental standards specific to: municipal solid waste (MSW) landfill sites, MSW material recovery facilities, MSW transfer stations, construction and demolition waste disposal sites, compost facilities, household hazardous waste depots, and the closure/ decommissioning of non-containment landfills are provided in separate documents. The standards specific to the type of waste management facility proposed, are complementary and additional to the requirements of this document.

The standards documents are intended to serve as guidance for information required in applying for a Certificate of Approval for the construction and operation of a waste Management system/ facility from the Department.

2.0 Background

The basis of modern waste management is to maximize environmentally sound waste diversion to minimize the quantity of municipal solid waste (and associated/ compatible waste streams) disposed to landfill. This is accomplished by reducing the quantity of waste initially produced; and diverting waste material to beneficial reuse, recycling, composting or energy production. Engineered lined landfill systems are constructed to contain the residual waste material in an environmentally secure manner.

The standards address the siting, design, construction, operation, and decommissioning of MSW management facilities/systems, to substantially reduce and mitigate adverse environmental impacts associated with handling and consolidation of waste material. These impacts may include: dust, odour or impaired air quality; noise; unsightly conditions, litter, nuisance vectors, rodents; potentially toxic leachate and surface water run-off; and hazardous materials spills, explosions or fire.

Effective operations management and good housekeeping practices are always required, in addition to properly trained staff, and current Operations Management/Maintenance manuals/plans, and Environmental Health and Safety Contingency Plans.

Innovative planning and design is encouraged to maximize safe, efficient and productive use of the property that is dedicated to waste management over the life of a facility; to control the cost of closure/decommissioning and post-closure care; and to allow for future productive use of the site.

3.0 Application

These standards apply to the development of MSW management facilities/systems including: Transfer Stations, Material Recovery Facilities, Household Hazardous Waste Depots, Composting Facilities, landfills for the disposal of inert Construction and Demolition debris; and new or lateral expansions of engineered MSW containment landfills.

Separate standards (GD-PPD-062) address the closure of non-containment landfills or "local dumpsites".

The Department may vary the requirements cited in the standards on a site specific basis while maintaining provisions for an equivalent environmentally sound design.

For all facilities, alternative environmentally sound designs and technology may be approved, in keeping with advancements in landfill and waste management science, and any resultant changes in regional waste composition or management practices. It is the responsibility of the owner/operator (proponent) to demonstrate, to the satisfaction of the Department, that the proposed alternate design is capable of achieving an equivalent or higher level of environmental protection than the standards. Alternative designs and technology will be assessed on technical merit and evaluated on a case by case basis.

4.0 Legislation and Approvals

4.1 Legislative Authority

A MSW management facility/system is subject to registration in accordance with Part X of the *Environmental Protection Act* and as detailed in the *Environmental Assessment Regulations*. The legislative authority for the establishment, development and operation of a municipal solid waste management system is provided through the *Environmental Protection Act,* Parts IV, V and XI (specifically sections 16, 78 and 83); and the *Municipalities Act,* Part XIII.1. The following non-exhaustive list of legislation also applies to waste management facilities/ systems and sites:

Provincial legislation

- *Environmental Protection Act SNL 2002 cE-14.2. and Regulations*
- *Occupational Health and Safety Act (O.C. 96-478) and Regulations*
- *Municipalities Act* , 1999 *and Regulations*
- *Water Resources Act, 2004 and Regulations*

Federal legislation

- Canadian Environmental Protection Act and Regulations
- Transportation of Dangerous Goods Act and Regulations
- Fisheries Act
- National Fire Code

Municipal

- Zoning Requirements and Building Codes as applicable

Note that Canadian Council Ministers of the Environment (CCME) Guidelines specifically

referenced in the Terms and Conditions of Certificates of Approval to Construct / Operate a Waste Management System / Facility, as issued by the Department, are enforceable under the Environmental Protection Act.

These guidelines include:

1) CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life
2) CCME Drinking Water Quality Guidelines; and
3) CCME Compost Quality Guidelines

4.2 Certificate of Approval Process

Upon completion of the Environmental Assessment Process, a Certificate of Approval to construct and to operate a MSW waste management facility/ system must be requested from the Department pursuant to the Environmental Protection Act, Parts IV, V and XI.

The standards outline the information required to support an application for a Certificate of Approval to construct and operate a waste management facility/ system, but additional information may be required by the Department. The facility design shall be completed by a Qualified Professional and outline all system components and assumptions. Engineering drawings and technical descriptions shall be provided in sufficient detail to allow evaluation of compliance with the environmental standards. A Quality Control/Quality Assurance program is also required for approval of all aspects of the facility/system, including design, construction, operation, and environmental monitoring.

Applications for a Certificate of Approval to construct and operate a municipal solid waste management system / facility must be accompanied by a letter from the local municipal unit confirming compliance with the applicable zoning, planning restrictions, and such other by-laws as may exist.

The Department may issue a Certificate of Approval for a specified operating period after which time a renewal may be requested by the owner/operator. In some cases e.g. a minimal impact recycling initiative or a composting pilot project, a Certificate of Approval may not be required. However, prior consultation with the Department is recommended in all cases.

4.3 Approval for Other On-Site Activities

The full scope of waste management activities associated with the construction and/or operation of a MSW management facility/system is subject to approval from the Department. Activities may include the collection, recovery, transfer, processing or storage, or final disposal of waste material. Although a single approval may be issued to a Regional Waste Management Authority or Regional Service Board as the responsible owner/operator, the technical design and operation of each facility or part of the system is subject to separate review and evaluation.

4.4 Public Notification and Information

The Environmental Assessment (EA) Process of the Department of Environment and Conservation includes provisions to notify the public of the proposed project. Once released, or if exempted from the EA process, there are public notification requirements to obtain a Certificate of Approval to construct and operate a MSW management facility/system.

If environmental assessment registration is not required, public notification shall consist of: either posting a public notice in a local newspaper once per week for three consecutive weeks; or serving notice by registered mail on the occupiers of property situated within 1.6 kilometres of the proposed site. The notice shall be provided to the Department for approval before posting or distribution. A municipal plan amendment notice may also serve as the public notice of intent to establish a site.

In all cases, and on an ongoing basis, it remains the responsibility of the owner / operator of the MSW management facility/system to ensure that participants in the system are kept informed.

4.5 Financial Assurance / Environmental Insurance

The facility owner/operator is required to ensure that appropriate and adequate financial assurances and/or environmental impairment liability (pollution abatement) insurance and automotive insurance policies are in place for all individual operators contracted to construct and to support the operations of a waste management facility and system, including a regional landfill/site. In most cases regional facilities would be owned/operated by the respective Regional Waste Management Authority or Regional Service Board. Financial assurance/insurance requirements for Regional Service Boards may be implemented at a later date.

The purpose of the requirement for financial assurance/insurance is stated in Appendix A. This requirement also applies to privately owned/operated waste management facilities/ systems, unless specific exemptions are permitted, or separate provisions are allowed. Further details can be discussed with the Department.

5.0 Environmental Standards

The environmental standards outline the requirements for the siting, design, construction, operation, and decommissioning of a MSW management facility/ system. All facility/ system components should be designed to function effectively for the life of the facility. All systems and features shall be technically sound, and demonstrated to meet environmental standards set by the Department in terms of structure and performance.

5.1 Site Selection

Table I provides some of the recommended separation distances of buffers from the active area of a MSW management facility/system and the property boundary. Where not otherwise specified in the table, the separation distance would apply to all types of MSW management facilities/systems. It is advised to exceed these recommendations where possible to reduce potential conflict with other land users. But the Department may alter setback requirements based on site-specific information, provided that the proposed design and setback distance continues to achieve an equivalent or higher level of environmental protection.

Table 1 Recommended Separation Distances for MSW Management Facilities/Systems

Siting Requirement	Recommended setback distances	
Land Use	Waste management facilities shall not be sited in environmentally sensitive areas (flood plains, parks, nature reserves, areas where there may be endangered species of plants or animals, wildlife migration corridors, wetlands, etc).	
Access and Road Restrictions	Access roads shall be accessible year round by the weight and type of vehicles anticipated.	
Soil Conditions	The lowest point of the constructed landfill liner system shall be at least 1m above the seasonal high groundwater table. Alternatively, a suitable under drain system shall be installed. There shall not be any bedrock or other rock outcroppings closer than 300 mm to the bottom of the liner system.	
Hydrogeology	Areas where there is a reasonable depth of native soils and no useful groundwater resources are preferred locations.	
Separation Distances from Landfill Property Boundary	Feature	Recommended Separation Distances (m)
	For active waste management areas (The 15 m closest to the property boundary must be reserved for natural or landscaped screening (berms or vegetative screens).	100 – landfill & in-vessel composting facilities 150 – open windrows 30 - MRF & transfer stations, HHW depot
	Residential, Industrial, Commercial and Institutional Properties	1600 – landfill & in-vessel composting facilities 300 – MRF & transfer stations, HHW depot
	Provincial Highway or Right of way of Public Road	100 - landfill & in-vessel composting facilities 30 - MRF & transfer stations, HHW depot
	The High Water Mark of a significant waterbody as defined under the Water Resources Act or assessed by the Department.	100
	Water Supply Area[a] or Any Well[b] Used as a Water Supply	300
Airports	A site shall be located a minimum of 8 km from airports that are used by commercial aircraft. This distance may be reduced if bird control measures, that are approved by both Transport Canada and the Department, are implemented or if the potential for birds causing hazard to aircraft is minimal.	
Unstable Area	No waste management facilities are not to be located within 100 metres of an unstable area[c]	
Fire Break	Distance to be approved in consultation with the Fire Commissioner's Office	

[a] As indicated in: The Atlas of Protected Public Water Supply Areas, Department of Environment and Lands, Water Resources Management Division (Live Document; Updated Continuously).
[b] Except for a well utilized solely by the facility.
[c] Landfills are not to be located in geologically unstable areas, or in coastal areas subject to impact from a rise in sea level.

5.2 Site Investigation

Environmental Baseline and Monitoring

An environmental baseline study, to provide information on regional and local hydrogeology, and groundwater and surface water conditions to establish the background conditions of the proposed site, will be required prior to approval for construction. The parameters for a typical Groundwater and Surface Water Quality Monitoring Program are provided in Appendix C.

Hydrogeology

Hydrogeological investigations shall include:

1) A description of regional geology and hydrogeology within 5km of the site identifying areas of unstable soils or bedrock and including a description of groundwater conditions;
2) a description of geology and hydrogeology at the site and at adjacent properties within 500m of the site, and the relationship to the regional conditions;
3) a detailed investigative study of the geology and hydrogeology of the site, including groundwater, bedrock and soil types and characteristics, topography, groundwater flow direction, water quality, conductivity and other related details; and
4) installation of a prescribed number of monitoring wells with a minimum of one installed hydraulically up gradient and at least three down gradient of the site. Consideration may be given to construct monitoring wells to also function as recovery wells in the event of subsurface impacts.

The Canadian Council of Ministers of the Environment (CCME) report, *Subsurface Assessment Handbook for Contaminated Sites* shall be used as a guide in developing and implementing the hydrogeologic study.

An outline of the study shall be presented to the Department for approval before implementation.

Groundwater quality investigation: Please refer to Section 13.5, and to Appendix C for further information on the establishment of baseline data and the development of a groundwater monitoring program.

The criteria used to evaluate potential impacts will be based on the appropriate CCME Water Quality Guidelines and will be applied on a site-specific basis depending on groundwater use in the area. The person conducting the groundwater monitoring program must be a suitably Qualified Professional.

Surface water investigations shall include:

1) a description of the regional surface water features (flood plains, wetlands, lakes, ponds, streams, other natural watercourses, drainage paths and boundaries and drinking water supply sources) and usage within a minimum of 5 kilometers of the site including any interactions or potential impacts between these water features and the surface waters near a proposed waste management facility/site;
2) a description of surface water features within 500m of the site and how they relate to the regional situation; and

3) a surface water investigation of the site to determine and assess water quantity and quality, habitat and ecosystem types and any other unique features.

5.3 MSW Facility/System Site Location and Design

All MSW facilities shall be located, properly designed and constructed to ensure environmental protection, and facilitate environmentally sound site operation, decommissioning and future use of the site.

Site location:

- ✓ an accurate description of the proposed location
- ✓ aerial photos;
- ✓ a legal survey;
- ✓ plans showing all property boundaries, buildings, roads, utility corridors, contours, drainage channels, water bodies, rights of way, easements, forested areas and adjacent land uses; and
- ✓ GPS coordinates/GIS system mapping of facility features in a compatible and manageable format and level of detail.
- ✓ Site compatibility with other land uses, and any environmental sensitivity of the area must be commented and addressed.

Facility location

- ✓ A surveyed plot plan.
- ✓ A description of the required infrastructure design specifications, access requirements and support services to handle the anticipated waste volume to be received / processed/ stored / disposed over the life of the facility.

Facility Design

Groundwater and surface water shall be protected through effective design features that minimize surface water run-on and run-off; provide for leachate collection and management, and facilitate effective environmental monitoring. The facility design and operations regime shall also serve to protect the public and workers, to control nuisance and provide for effective emergency response.

Design considerations generally include providing sufficient space for safe handling of the volume and type of material received regularly, and adequate storage space where transfer, treatment or disposal may be interrupted for a short period of time. It is also important to provide safe and comfortable working conditions for staff; safe transport and delivery conditions for waste transporters and the general public, and secure access.

The design of the facility shall be shown on plans certified by a Professional Engineer and described in written form. Specifications, maps, cross sectional plans and profile drawings to allow a detailed evaluation to determine compliance with the environmental standard.

6.0 Construction

All waste management and associated facilities are to be constructed: according to the approved design; following approved Quality Assurance and Quality Control protocol; and consistent with sound environmental practices for construction activities.

Prior to the site opening, the proponent shall provide documentation, in the form of a Certificate of Completion, that the facility/site has been constructed as proposed, that all environmental systems are in place and functional, and that the facility/site is ready to receive waste.

The Certificate of Completion shall include:

- as-built drawings;
- quality control certifications as applicable (Refer to Appendix B); and
- a Certificate of Completion report from the Qualified Professional stating that the facility has been constructed as designed and outlining any deviations from the original design and the rationale for those deviations;
- a description of facilities constructed along with photographic records; and
- a facility operations and maintenance manual.

7.0 Quality Control/Quality Assurance

Quality control/assurance (QC/QA) is defined as a planned system of inspections and activities that provide assurances that the design, manufacture and installation of systems and materials used in the construction and operation of the facility meet the purposes for which the systems and materials are intended. Appendix B provides an example of a Typical Quality Control/Assurance program for a MSW landfill. However, a quality control/assurance program shall be specific to the type of facility/system that is being constructed and operated.

In all cases, manufacturers' specifications for the installation and operation of equipment/components shall be adhered and compliance documented. Operating instructions and maintenance procedures shall also be adhered and documented daily to ensure that installations function safely and as specified by the manufacturer. Directives of regulating agencies shall also be adhered.

A description of the quality control/assurance program to be carried out on all aspects of the waste management facility/system that are integral to environmentally sound design and performance is required. This information is required by the Department to obtain a Certificate of Approval to construct and operate a waste management system. The implementation of an Environmental Management System e.g. ISO 140001 is recommended. Such a system would be based in a culture of continuous improvement employing a "Plan, Do, Check, Revise" protocol.

8.0 Reception of Materials (waste and recyclables)

8.1 Receiving Areas

Details of material receiving and storage areas, including infrastructure for monitoring, the storage volume, and access are to be clearly described.

Roadways on site are to be surfaced, drained and maintained to bear vehicle traffic without rutting or excessive erosion.

8.2 Inspection and Monitoring

All waste management facilities shall have a system in place to both monitor and control the material accepted at the facility. All vehicles delivering material to the site shall be screened to ensure they are carrying acceptable materials.

A waste transport vehicle known or suspected to be carrying unacceptable or hazardous waste material shall be refused access to the site. A contingency plan should be in place to deal with unacceptable waste material including a list of transport, recycling and disposal options. Questions regarding appropriate disposal should be directed to the regional Service NL Office.

All incoming loads shall be viewed by a trained operator/attendant during discharge from haulage vehicles, and any non-compliant materials shall be immediately segregated and removed from the site, according to the operation manual, and as per the applicable contingency plan options.

Details of non-compliant material brought to the facility shall be recorded, including the date, type and quantity of non-compliant material, the identity of the haulage vehicle, reported origin of the material, and contact information for the hauler and owner.

8.3 Measurement of Material

Waste management facilities/systems serving a population of 5,000 or more, or which receive more than 5,000 tonnes/year of material may use measurement methods approved by the Department. For transfer stations or municipal landfills serving populations greater than 10,000 or which receive greater than 10,000 tonnes/year, and for all private landfills, weigh scales are required.

The federal government requires that weigh scales used to assess charges related to the weight of a commodity be accurate and sensitive to the range of weights being measured. A weigh scale accurate for measuring typical commercial waste vehicles and/or containers (loaded weight as well as tare weight) may not be accurate for measuring waste loads brought to a transfer station or a landfill in smaller vehicles such as pickup trucks and private automobiles. If fees are being contemplated for small loads, the accuracy of the scales for measuring these smaller weights should be confirmed with the federal Department of Consumer and Corporate Affairs -Weights and Measures. Alternatively, charges for these loads could be based on typical load sizes according to type of vehicle rather than on a direct measure of weight.

8.4 Acceptable Material

Waste management facilities shall accept only materials of municipal origin as approved for processing, recycling, composting or final disposal at the specific facility / site location. The Certificate of Approval is issued by the Department and administered by Service NL. Questions as to the acceptability of various waste types are to be directed to the regional Service NL office.

8.5 Unacceptable Material

The following is a list of wastes for which disposal to landfill is prohibited. The appropriate disposal option shall be specifically approved / approved with restrictions by the Department. Some of these wastes categories may be approved for recycling, composting, or thermal treatment.

1) Bulk liquids of any kind, with the exception of used oil, where a registered and approved used oil storage tank system is in place.*
2) Semi-solid sludges which contain free liquid including septage, black water, sewage treatment sludge, etc.; *
3) Special waste shall normally be accepted ONLY at the Regional Waste Management Facility, and only upon written approval from the regional Service NL office. The handling and disposal guidelines, and technical recommendations of regulatory agencies, shall be adhered

in all cases. Burial may be approved only if there is no viable alternative for treatment or final disposal, recycling, reprocessing or composting; and only if burial is an environmentally sound option for the waste in question. The viability of alternatives is to be determined by the Department. The specific on-site location of any burial shall be permanently marked and recorded to allow retrieval should corrective or further management of the waste be required at a future time. *

4) Organic and compostable waste, which may include various special waste types, shall be diverted wherever possible to an appropriate composting facility/operation.
5) Industrial/ commercial/institutional waste sources shall only be accepted with pre-approval from the regional Service NL office and the Regional Service Board.
6) Biomedical waste shall NOT be accepted.
7) International waste is to be considered as "special waste". *
8) Specified risk material is to be considered as "special waste", and may ONLY be disposed at the regional landfill. However, a permit is required from the Canadian Food Inspection Agency under the Health of Animals Act prior to moving this material from its point of origin.*
9) Acceptance of automotive tires as included in the Used Tire Recycling Program at a waste management facility, for temporary storage would require a written request for an approval and/or an amendment to the Certificate of Approval. The Departmental Guidelines for the Establishment and Operation of Facilities for the Outdoor Storage of Tires (B. Drover, 2002) shall apply. Copies of this document are available upon request from the Department.

   Interim storage of used tires with a rim diameter equal to or less than 24.5 inches at transfer stations is limited to approximately 100 tires. The MMSB provides a collection service program tires (tires from highway vehicles) and shall be contacted at 1-800-901-6672 regarding pick-up when a minimum quantity (30 to 100 based on location) has been collected. Tires must meet MMSB specifications: whole tires with rims removed that are clean. Tires filled with rock, dirt, or other debris are not acceptable for recycling and will be rejected. Program tires collected shall not be stockpiled for more than one (1) year. The maximum number of tires to be stored at a transfer station at any given time shall not exceed 150 and the storage location shall be accessible by truck.

   There are no levies applied to all-terrain (ATV), or off the road (OTR) vehicle tires. Off the road tires can be defined as tires used on rolling stock equipment used in the agricultural, forestry, industrial/construction and mining industries. These tires are not collected under the Used Tire Recycling Program by MMSB. If not approved for specific recycling applications, they shall be disposed to the regional waste management facility in accordance with the current Operations Plan for the facility.

10) Recyclable metals may be stored at a designated location on-site in an organized and safe manner. All environmentally hazardous materials shall be safely removed and appropriately contained/stored prior to stockpiling the metal. Access to this area shall be controlled by gating/fencing and monitored. Vehicles wrecks and scrap metal shall be directed to a recognized metal salvage and recycling operations where this option is available. White metal wastes such as freezers, refrigerators and stoves may be appropriately stockpiled in a separate area, pending at least semi-annual transport to a recycling operation. *
11) Equipment containing regulated substances (refrigeration, air conditioning and fire extinguishing equipment) shall not be disposed of at a waste disposal site without first having the regulated substance recovered by a person approved under the Halocarbon Regulations and shall be labelled "Halocarbon Free".
12) Fuel storage tanks (commercial or residential) shall not be accepted at a waste disposal site

without confirmation that the tanks have been purged of product, tank bottom sludge and vapour. The tank must also be cut in half or sufficient openings cut in the tank to prevent the accumulation of vapour and to accommodate visual inspection. If municipalities, transfer stations or regions would like to develop a fuel storage tank management program, the Department shall be contacted to amend or issue an approval.*

13) Hazardous waste dangerous goods A designated holding and inspection area to facilitate proper handling of wastes which are suspected to contain hazardous materials is required. Where there exists any doubt regarding the properties of a given waste, consultation with the regional Service NL office is required prior to disposal Municipal and industrial landfills in this province are not permitted to accept hazardous waste materials other than Household Hazardous Waste for storage at approved depots.
14) The storage of Household Hazardous Waste must be approved by the Department. These HHW depots or areas shall be an enclosed structure, fenced, locked, and underlain by an impermeable surface, have adequate ventilation and a means to contain any spills before reaching the receiving environment.*
15) Low level radioactive material (NORMS <70 becquerels/g total specific activity) shall not be accepted at waste management facilities. An exception may be made for the collection and storage of small quantities of smoke detectors at household hazardous waste depots.
16) Radioactive material (>70 becquerals/g) is separately regulated by the Canadian Nuclear Safety Commission, and shall not be accepted.
17) Any mixture or combination of the above restricted waste categories (1-16) is also restricted or prohibited.

* These waste types require special provisions for treatment and/ or disposal for which specific approval must be requested from the Department.

A Certificate of Approval from the Department is also required for the handling and transportation of hazardous materials and low level radioactive materials to licensed final treatment or disposal facilities. With respect to all waste types, depending upon the origin and nature of the waste material, other Provincial, and Federal Legislation and Regulations, or Agreements and Guidelines may apply.

8.6 Construction and Demolition Debris

Construction and demolition debris shall be directed to the appropriate location for reuse and recycling where this is possible or to the C & D landfill for final disposal. In some cases clean wood waste and landscaping debris may be directed to composting. Please refer to the Environmental Standards for Construction and Demolition Debris Landfills.

8.7 Electronic Waste

Electronic Waste may contain hazardous constituents such as lead and mercury. Used electronic equipment and devices should be collected in a secure storage area, for regular removal to recycling where a program exists. Recycling is required for commercial quantities of electronic waste.

In 2012, the Government of Newfoundland and Labrador announced amendments to the *Waste Management Regulations* under the *Environmental Protection Act* introducing an industry-led electronics waste recycling program based on Extended Producer Responsibility (EPR).

Since August 2013, the Electronic Products Recycling Association (EPRA), a not-for-profit,

industry-led organization has been accepting for recycling a range of regulated products including: display devices (such as televisions and monitors), desktop printers, computers and peripherals (such as keyboards), home theatre in a box (HTB) systems, non-cellular telephones as well as audio and video systems. For a complete list of electronic products accepted through the program, and to find the location of the nearest drop off centre click here or call toll free: 1-888-503-3201.

Further information on other electronics EPR programs is available by contacting the Multi-Materials Stewardship (MMSB), or from the website http://www.mmsb.nf.ca/electronic-recycling.asp where links to details about the various and drop-off centres are provided.

9.0 Facility Operations – Design Considerations

A waste management facility must be operated safely and efficiently in a manner that has the least adverse environmental impact. Environmental impacts of concern may include: potential contamination of surface water or groundwater due to toxic leachate or run-off from the site; impaired air quality due to odour and dust; excessive noise from machinery and traffic; health and nuisance concerns if rodents and flies proliferate, and litter from windblown debris. The siting and design of a facility, including the infrastructure, equipment, and provision for mitigation/monitoring of environmental impacts are essential to minimizing conflict with adjacent land users.

9.1 On-Site Processing

For approval purposes, the details of processing facilities for volume reduction, materials recovery, or materials preparation (e.g. for composting) are to be provided to the Department including the general type, size, and location of equipment, sorting pads, and facilities.

In selecting technology and equipment, consideration shall be given to reducing overall environmental impact, energy conservation, maintaining worker friendly working conditions, and to the desired end-use for the recycled material. Space requirements, performance and efficiency (sizing buildings and equipment for the anticipated waste throughput), and long term costs for operation and maintenance shall be also be considered.

9.2 Surface water and storm water management

Surface/Storm water management and control systems shall be provided and designed to:

- divert storm water and run-on away from working areas;
- collect and control run-off waters from the site to remove sediment prior to discharge; and to reduce erosion impact to the intermediate and final cover.

Storm water management systems shall be designed to handle a 1 in 100 year storm event for a duration appropriate to the size of the drainage basin. Sedimentation pond construction specifications shall be provided to the Department.

Surface water management systems should be hydraulically separate from the facility's leachate management system(s).

9.3 Leachate management

Potentially toxic leachate may emanate from stockpiled waste material wherever there is

exposure to the elements, and a pathway for leachate migration. This could occur when waste is laid out at the receiving area of a waste transfer station or placed for in-vessel composting; or once the waste that has been placed in a landfill for final disposal.
A leachate management system consists of leachate collection and treatment to remove contaminants prior to discharge to the receiving environment. The installations to achieve effective leachate management are not usually complex for enclosed facilities which can be constructed with built-in secondary containment features and collection sumps. Engineering requirements may be considerably more complex for lined landfills where the system must be designed to accommodate the local hydrogeology and climate, and protect the environment for the life of the facility and post-closure period.

In any case, the leachate management system shall include suitable infrastructure to recirculate, or store, treat and discharge or acceptably dispose the leachate volumes anticipated from the facility/site. Detailed information about the engineering design, and the components and construction materials needed to effectively manage the volume and composition of leachate for the life of the facility/site, shall be provided to and approved by the Department.

In all cases, any discharge of wastewater or leachate from a waste management facility is required to meet criteria limits set out in the *Environmental Control Water and Sewage Regulations*; and/or the CCME water quality guidelines where applicable. This requirement will be a condition of the Certificate of Approval and is further discussed as part of environmental monitoring.

9.4 Odour Control

Systems and operational protocols for odour management shall be in place and all managerial staff shall be properly trained. Specifications and details shall be provided, and shall include:

- installing ventilation and air filter systems, and maintaining negative air pressure for material reception and storage facilities;
- maintaining equipment and systems and regular air quality sampling; if required and impacts on receptors;
- maintaining a consistent throughput of material so as to avoid stockpiles;
- scheduling the receipt of materials and facility activities so as to minimize adverse impact on neighbours e.g. considering wind direction, ambient temperature and time of day
- establishing good housekeeping practises to keep roadways, buildings, grounds and equipment clean; and
- effectively addressing odour complaints.

10.0 Operations Plans

10.1 Manual

A facility Operations and Maintenance Manual is required for all waste management facilities and systems. The following shall be addressed in detail and as applicable:

a. site security, manpower, supervision, access and signage;
b. unacceptable/prohibited activities e.g. no open burning or smoking on-site;
c. control systems for nuisance factors including vectors, rodents, scavenging, illegal

dumping, malodour, dust and litter;

d. procedures for inspection of materials prior to acceptance at the facility;

e. acceptable and unacceptable waste material/waste streams and contingency options;

f. contingency and environmental emergency plans;

g. environmental monitoring program(s);

h. facility/site day-to-day operations protocol /procedures;

i. site and equipment maintenance schedule / regime;

j. staff/operator training in facility operations, & environmental health and safety;

k. record keeping and reporting;

l. contact information for owner/operator and site managers / supervisors;

m. on-going Quality Control / Quality Assurance protocol (Plan, do, check, repair/revise/repeat where appropriate); and

n. a copy of the facility Certificate of Approval.

The Operations Management/Maintenance Manual shall be prepared by the owner/operator and approved by the Department.

The operation of the facility shall be in compliance with the provisions of the Certificate of Approval, and a copy of the Operations Manual is to be kept on site and readily available to staff and regulators.

10.2 Environmental Emergency Health and Safety Contingency Plans

The owner/ operator shall have up-to-date contingency plans in place to effectively handle all reasonably foreseeable emergencies such as, fire, malodour, flood, power outage, delivery or spillage of hazardous waste/ materials, explosion, leachate leakage, or any other emergency or issue which could result in disruption of facility operations and/or environmental damage. Bound copies of the contingency plan(s) shall be kept at each facility with the Operations Manual. The plans shall describe appropriate mitigation measures required to prevent damage to the waste management facility and the environment. Employees shall be familiar with the contingency plan(s) and participate in regular practice response exercises.

The attendant on site shall be equipped with an effective and quick means of communication for personal safety and to contact first responders (facility owner/operator, fire, police, and medical) in the event of an emergency.

An appropriate fire control program shall be in place on a continual basis. The program shall be developed in consultation with the local Fire Department. Fire safety plans, including the comments of the first responder fire department as to the adequacy of the plan, are to be provided to the Department. The Department of Natural Resources shall also be advised in areas where there is a forest fire risk.

The contingency plan shall be reviewed annually and revised as needed.

11.0 Records and Reporting Requirements

The use of electronic records and reporting in a compatible format shall be considered as a means to reduce excessive use of paper. However, retaining limited hardcopies of annual reports,

financial transactions, correspondence, and contingency plan implementation that are considered significant are recommended. Facility records shall be available for review, and reports submitted to the Department.

11.1 Certificate of Completion

The report including as- built drawings and quality control/assurance records for construction period shall be submitted to the Department prior to commencing operations, and copies retained for future reference if needed.

11.2 Operations Management and Maintenance / Routine Inspections

A standard form for recording completion of operational tasks and maintenance on a daily, weekly, or as appropriate basis; and routine inspection reports shall be maintained as part of operations records. These records shall be kept at the facility and made available to regulatory agencies upon request.

11.3 Complaints

Records of complaints regarding operational, environmental, nuisance or other issues shall be kept and include: the contact information for the complainant, a description of the complaint, and the action taken / how the complaint was responded. The date and time of the complaint, a description of facility activities and related atmospheric conditions at the time, shall also be recorded

11.4 Staff training

Certification and training records are required to ensure that staff are appropriately trained for the assigned work and that training is current as per applicable legislation and guidelines and recommended industry practices.

11.5 Contingency Plan Implementation / Emergency Response and Safety Equipment

Records of all incidents of contingency plan implementation shall be kept on file and reported to the Department as set out in the plan. The contingency plan shall be updated annually or as required, and an up to date inventory of emergency response and safety equipment shall be maintained to ensure that supply is adequate.

11.6 Environmental monitoring reports

Reports are to be submitted on an appropriate basis to establish the effectiveness of mitigation measures and wastewater/leachate treatment systems where applicable. Monitoring is required to detect and prevent adverse environmental impact due to facility operations.

Environmental Monitoring Reports for various waste management facilities/systems and the regional site may include as applicable:

- groundwater and surface water quality monitoring data and interpretation;
- pre- and post-treatment leachate monitoring data including total, peak and average flows; leachate quality and an interpretation of leachate management effectiveness (for landfills and compost facilities primarily);
- gas production monitoring data and interpretation; including total production, peak and average for landfills with landfill gas management systems;
- air quality monitoring where a problem is suspected or identified; and

- monitoring for vectors (flies/rodents) where a problem is suspected or identified.

The reporting requirements may be more intensive during the first year of operation and if problems occur or are suspected. However, exceedance of criteria limits for leachate, surface or groundwater quality parameters, as set out in the approval, shall to be reported immediately to the Department.

11.7 Annual Report

The report will summarize the MSW management facility/system activity over the past year, present an evaluation of environmental monitoring data, and highlight any proposed changes to operations or monitoring.

Information contained in the annual report shall include:

- changes to facility or systems operations;
- problems or complaints and the resolution;
- a waste flow summary i.e. type, origin and quantities received and buried on site;
- an estimate of remaining facility operating life or landfill capacity;
- description of any environmental incidents / contingency plan implementation;
- the inspection reports and summary of findings/recommendations;
- updates to operations plans, contingency plans, and decommissioning plans; and
- a summary and evaluation of environmental monitoring data/reports and facility performance in terms of regulatory compliance and environmental protection

NOTE: Regional Service Boards may opt to submit one annual report providing summary information for all facilities/sites within the Regional Waste Management System.

11.8 Decommissioning and Post-decommissioning Reports

A decommissioning summary report describing the condition of the facility and site following closure and decommissioning, and describing any future environmental concerns relating to leachate, groundwater and surface water and gas generation is to be provided. The report shall describe any current problems on the site and/or off-site impacts, and provide an assessment of the future impacts.

Annual post-decommissioning reports shall be submitted to the Department of Environment updating the on-going maintenance and monitoring and activities, and summarizing inspections results. Any problems and corrective actions taken shall be noted.

12.0 Site Safety and Security

12.1 Site Access

Access to the site shall be designed to accommodate vehicles, which include large compactor trucks and heavy equipment normally used to move waste at the site.

Access shall be restricted to hours of operation, when operating personnel are present.

Access to the site shall be controlled by the use of barriers, fencing and gates. The type and extent of fencing will depend on the existing natural vegetation and topographic features and is to be approved by the Department. All access points are to have locking gates.

All roads on site shall be properly maintained to minimize the potential for dust, mud or wastes from the facility being carried onto access, public or private roads.

Suitable waste drop off areas shall be provided for public use.

Information regarding the conditions of access and restrictions shall be posted at the site entrance.

12.2 **Signage**

Legible and appropriate signage is required:

- at the site entrance(s) stating the name and purpose of the facility and listing materials acceptable for disposal, hours of operation, emergency and general contact information; and
- to direct vehicles to the appropriate solid waste unloading areas such that small vehicles do not have direct access to the landfill working face.

Specifications regarding the signage, fencing and gates are to be provided to the Department.

12.3 **Prohibited Activities**

Open burning and scavenging are strictly prohibited.

There shall be no smoking at any waste management facility, with the exception of a location designated for the use of employees who smoke.

12.4 **Staff Training and Certification**

Key personnel shall be trained in operations of the waste management facility and be certified through the Solid Waste Association of North America (SWANA) or an accepted equivalent.

On-site operators shall be trained to identify hazardous and unacceptable materials. Maintaining the appropriate level of training/certification will help ensure MSW is disposed of properly, and that hazardous and unacceptable materials are disposed safely and appropriately.

The facility specific training requirements and schedule shall be included in the operations manual.

12.5 **Employee and Administrative Facilities**

Appropriate employee and administration facilities are to be provided, to satisfy occupational health and safety regulations and provide for worker comfort. Secure storage space is also required for administrative records, personal protective equipment, tools, and for any combustible materials that may be used on-site.

12.6 **Site Safety and Personal Protective Equipment**

There shall be an appropriate number of on-site trained personnel at all times while the facility/site is open for operation. The facility and site shall be closed and locked outside hours of operation.

All personnel shall be familiar with the Operations and Maintenance manual/ plan, and the

Environmental Health and Safety Contingency Plan, and have detailed knowledge of plan information for the part of the facility where they are stationed. All personnel shall also be equipped with personal protective equipment. appropriate to their level of training and assigned tasks and safety and emergency response training shall be kept current and reinforced with regular exercises.

Emergency response equipment and exits shall be conveniently located and clearly marked. In the event of an electrical outage, alarms, communications systems and security lighting shall be sourced with back up power. Provision for emergency shutdown of machinery shall be consistent with industry standards and safety guidelines.

12.7 Public Education and Awareness

The owner/operator of the waste management facility/system has the responsibility to ensure that the public is provided the information they require to effectively and safely participate in modern waste management activities. This includes an understanding of the respective roles and requirements of system participants, and a general understanding of how facilities operate and of any hazards/safety considerations.

13.0 Environmental Monitoring

An appropriate environmental monitoring program is to be developed for all waste management facilities/sites. The owner/operator shall prepare and propose a program which satisfactorily addresses, where applicable: surface/storm water management, surface water and groundwater monitoring, leachate collection/management, and landfill gas management. Environmental monitoring programs are to be developed in consultation with, and approved by the Department. Appendix C provides information on a typical environmental monitoring program, however, the Department may adjust the list of parameters and/or monitoring schedule on a site specific or as-needed basis. Environmental monitoring requirements also include air quality and nuisance factors such as litter and rodents with respect to problem prevention and control.

The owner/ operator is required to submit an annual report outlining the results of the environmental monitoring programs and providing an assessment of compliance and impact. If monitoring indicates that there are negative environmental impacts as a result of the operation, then corrective measures must be put in place and the Department notified immediately. The report shall be prepared by a suitably Qualified Professional.

13.1 Surface / Storm Water Management

Discharge from a sedimentation pond shall meet the *Environmental Control Water and Sewage Regulation, 2003* as listed in the separate Appendix C. For parameters of concern that are not addressed by the regulations, the appropriate CCME Water Quality Guidelines will apply. If compliance monitoring and sampling indicates problems, then corrective action must be taken immediately.

13.2 Leachate Management Program

Leachate collection and treatment systems shall be properly installed, managed and maintained throughout the life of the site. All leachate shall be tested and treated to remove contaminants prior to discharge.

The discharge of wastewater or leachate from a waste management facility is required to meet criteria limits set out in the *Environmental Control Water and Sewage Regulations*, 2003; and/or the CCME water quality guidelines as applicable. Additionally, liquid effluents shall not be acutely lethal as determined by the suite of biological test methods developed by Environment Canada for this purpose. These requirements are further discussed as part of environmental monitoring and will be a condition of the Certificate of Approval.

The list of parameters to be analyzed, and frequency of sampling shall be determined by a suitably qualified professional in consultation with the Department, and outlined in the facility / site specific environmental monitoring plan.

Contingency plans in the event of problems with any part of the system shall be in place to mitigate environmental damage as part of regular maintenance programs.

13.3 Landfill Gas Monitoring Program – applies only to MSW landfills

Landfill gas (methane production shall be managed to control the discharge of potentially dangerous gases into the atmosphere. At no time should combustible gas concentrations be allowed to exceed or be predicted to exceed the lower explosive limit in soils at the property boundary or 25% of the lower explosive limit at or in on-site or off-site structures. Venting or gas collection systems shall be installed to control and monitor the gas production in the landfill.

All new landfills shall be assessed for the viability of energy recovery from gas production. The results and interpretation of this assessment are to be submitted with the application for a Certificate of Approval. Landfill gas management systems and the viability of landfill gas recapture, will be evaluated on a case by case basis.

13.4 Surface Water Quality Monitoring

A regular program of surface water monitoring may be required for all waste management facilities/ sites and shall include a program to:

- measure baseline surface water quality upstream of the site;
- detect and measure any leachate contaminant in the surface water; and
- suitably designed QC/QA.

The surface water monitoring program shall include a combination of visual inspection for leachate seeps, along with surface water sampling. Refer to Appendix C for a typical surface and groundwater monitoring program.

13.5 Groundwater Monitoring Program

A groundwater monitoring program designed by a qualified professional, is to be site specific and shall include an appropriate number and configuration of monitoring wells around the perimeter of the site, both up and down gradient, to allow accurate evaluation of the impact of the operation and assessment of any migration pathway.

The groundwater monitoring program may be required for all waste management facilities/ sites and shall include:

- a program for baseline groundwater chemistry;
- a program for detection of leachate in the groundwater;
- a program to measure the extent and magnitude of any leachate contamination;
- measuring groundwater levels and general hydrogeological conditions on the site; and
- a suitably designed QC/QA program.

Monitoring wells shall be installed to a depth which will span the anticipated high and low water table levels and be appropriately sized to allow proper well development, purging and sampling. Monitoring wells will also be used for the measurement of water levels, the determination of horizontal and vertical gradients and the determination of flow directions and groundwater velocities. Refer to Appendix C for an example of a typical surface and groundwater monitoring program.

The groundwater monitoring system for a MSW management facility/system such as a landfill or composting in open windrows should consist of the following:

- groundwater monitoring wells installed hydraulically above and below the gradient direction of the facility;
- monitoring wells located sufficiently close to the active disposal area to allow early detection of contamination and implementation of mitigation measures;
- specifications for well drilling methods, casing, screens, filter packs, annular space seals, ground surface seals, grout, caps, development and purging; and
- the monitoring wells are to be retained throughout the lifespan of the facility.

Evaluation Criteria

Surface water and groundwater monitoring results shall be consistent with baseline data and meet the appropriate CCME Water Quality Guidelines depending on the surface water and groundwater use in the area.

Discharge water must always comply with the *Environmental Control Water and Sewage Regulations*, 2003.

The person conducting the groundwater monitoring program must be a qualified professional.

The Department of Environment and Conservation Policy PD:PP2001-01: *Use of Accredited and Certified Laboratories* applies. (separate document)

13.6 Air Quality, Dust and Noise

A program for the monitoring and maintenance of acceptable air quality in working areas, both inside buildings and structures and on the site, shall be developed to meet or exceed Occupational Health and Safety guidelines and provide a comfortable work environment.

Similarly worker exposure to noise shall be within safe and acceptable limits. Depending upon the nature of, and activity level at the waste management facility, personal protective equipment may be required to control exposure to excessive noise.

13.6.1 Odour Management Program

An odour management program shall be submitted to the Department prior to approval and shall include information respecting:

- geographic features of the proposed site and facility design measures that may facilitate odour control (e.g. location of loading doors and vents);
- the sensitivity and location of facility users, and occupants of adjacent and nearby properties;
- area population density and traffic;
- existing and planned development in the immediate area;
- climatic features such as prevailing winds direction and speeds, annual rainfall, average seasonal temperatures, humidity and pressure conditions; and
- a description of the local air shed including a statement about the geographic area of potential impact from odours.

The Department may require the proponent to submit results of air dispersion modeling to determine the likelihood of problem odours at the property boundary and near the facility. The aim of air dispersion modeling is to provide baseline information for air quality in these areas and to identify parameters and limitations for future air quality testing.

13.7 Vector Control

A program to control the breeding and proliferation of potential disease and nuisance vectors (e.g. mosquitoes/flies/rodents) shall be developed and maintained for the operating life of the waste management facility and into the post-closure period. Details shall be provided to the Department as an approval may be required for the use of chemical pesticides. The *Pesticides Control Regulations, 2003* apply and advance notification and signage are required if chemicals are to be used at or near the site/facility.

Exposure of facility staff and the general public to any chemicals shall be avoided. If problems develop or persist a monitoring program may be required.

14.0 Decommissioning

The design of the waste management facility(ies) and system components shall take into consideration the requirements for proper closure and decommissioning at the end of the operating life.

14.1 Preliminary Decommissioning Plan

A Preliminary Decommissioning Plan based on the estimated operating life shall be submitted to the Department to obtain a Certificate of Approval for the construction and operation of a waste management system. The information that may be required, depending upon the nature of the facility is as follows:

a) a closure activities itinerary and schedule;
b) an operation plans for pollution abatement engineering works such as leachate collection and treatment systems;
c) post-closure environmental monitoring programs for leachate, groundwater and surface water quality;
d) a plan to stop accepting waste and remove all remaining waste material in advance of closure;

e) a description of what may be remaining on the site in perpetuity, and any remedial work that may be involved;
f) removal of infrastructure or renovation for an acceptable future activity;
g) current and projected cost estimates to complete decommissioning, and the corresponding details regarding acceptable financial assurance;
h) proposed post-closure use of the property; and
i) any other information required by the Department.

Note that an updated decommissioning plan must be submitted to the Department whenever significant changes are made to the waste management facility or site.

14.2 Notification of final closure/decommissioning

The owner/operator shall notify the community (ies), site users and the Department in writing of the pending shutdown of the site at least 180 days in advance of the site ceasing operation and provide an estimate of the engineering costs to complete the decommissioning.

The detailed decommissioning plan for the site must be approved by the Department and the Department notified when the site decommissioning activities begin and are completed.

Appropriate signage shall be placed at the site entrance to notify site users of the pending decommissioning of the site, along with the date of shutdown and details on where waste shall be taken once the site closes.

14.3 Detailed Decommissioning Plan

The final decommissioning plan is to be submitted to the Department for approval at least 6 months prior to final closure of the waste management facility /system. Based on the premise that the facility (ies) have been approved, appropriately operated, maintained, and progressively decommissioned in the case of a landfill, site cleanup, preparation and remedial work should be completed in a very timely manner.
Information to be provided/ updated includes:

- notification requirements and alternate disposal site locations;
- description, schedule and costs associated with decommissioning activities;
- final cover design and installation details, and any additional work required;
- measures taken to ensure that access to the closed site is restricted or removed;
- contingency plans for fire, illegal dumping and nuisance control post-decommissioning; and
- any post-decommissioning monitoring and maintenance, including security and environmental monitoring requirements.

As part of the decommissioning plan the proponent shall provide up-to-date drawings for all remaining facilities, components and installations. An up to date and accurate plot plan, including geographic positioning system coordinates for site features, showing the locations of permanent survey markers shall also be provided.

For landfills, the environmental management systems and the monitoring regime for surface and ground water quality; the integrity of the final cover, landfill gas control and leachate management should be clearly described. There should be no waste remaining on site following closure and

decommissioning of any other types of waste management facility/system. However, site-specific arrangements for ongoing monitoring will be required in the event that some contamination occurred during the operation of a facility e.g. in the event of a fire, or a hazardous material incident.

This detailed plan will likely elaborate on the preliminary decommissioning plan submitted with the original application for site approval.

In all cases the final condition of the facility/site, following closure/decommissioning, will require inspection and approval by the Department.

14.4 Post-Decommissioning Monitoring and Maintenance

A proposed schedule for environmental monitoring and maintenance activities for the decommissioned facility/site will be required to ensure no long-term negative impacts to the environment. The extent of monitoring and maintenance requirements will be facility/ site specific and shall be approved by the Department.

14.5 Decommissioning / Post-Decommissioning Reporting

A decommissioning summary report and annual reports thereafter, consistent with the proposed environmental monitoring and maintenance regime, will be required by the Department. A decommissioning summary report shall describe decommissioning activities and the condition of the site at closure noting any problems, on or off-site impacts, and an assessment of future impacts.

The site owner/operator shall submit annual reports to the Department detailing the post-decommissioning monitoring and maintenance activities, laboratory analyses of all sampling programs, and summarizing the results of all inspections. The duration of the post-closure/decommissioning monitoring period will be site specific and related to any potential environmental impacts identified or problems encountered.

The owner/operator of the site shall immediately advise the Department of any adverse effects on the environment and take corrective action as required. Site records and reports shall be made available to the Department upon request. The Department may vary the frequency of inspections should the results of inspections determine that this is justified.

14.6 Future use of the Site

The future use of the site should be consistent with recommendations of the decommissioning report and approved by the Department.