Newfoundland Labrador

GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR

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GUIDANCE DOCUMENT

Title: **Environmental Standards for Municipal Solid Waste Material Recovery Facilities**

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1.0 PURPOSE

These Standards outline the requirements for municipal solid waste material recovery facilities.

They provide environmental guidelines for site selection, design, construction, operation and decommissioning of a Material Recovery Facility (MRF) to provide a high level of environmental protection. This document is also intended to serve as guidance in applying for a Certificate of Approval to construct and operate a Material Recovery Facility.

2.0 BACKGROUND

The Material Recovery Facility (MRF) is the part of a Regional Waste Management System place where the dry fraction of municipal solid wastes is delivered to be separated, processed and temporarily stored for transport to recycling or remanufacturing.

MRF's that receive source separated dry materials such as paper, glass, cans and plastics, are known as "clean MRFs" and are an integral component of any waste management system. The standard focus' on facilities that process dry recyclables generated in the municipal and commercial waste streams. The overall environmental risk of implementing this type of recovery facility is low, but potential impacts of larger scale MRFs may include:

- handling of large quantities of loose materials such as scrap paper can create windblown litter;
- storage both before and after processing of large quantities of materials, such as plastics may present a fire hazard;
- the temporary storage and handling of reject materials may be required in some cases; and
- increased truck traffic may cause land use conflicts.

3.0 APPLICATION OF ENVIRONMENTAL STANDARDS

These standards apply to the development of facilities that receive dry materials derived from the MSW waste stream for the purpose of recycling. They also apply to the dry portion of wet/dry type processing facilities. For wet/dry type facilities, the wet portion of the facilities shall comply with the requirements for compost facility development.

These Standards do not apply to:

- depots for the return of beverage containers;
- the recycling of dry waste material that is not normally considered part of the municipal waste stream, such as auto salvage; and,
- Extended Producer Responsibility (take-back) programs established by an industry to collect and manage their product at end of life.

The Province may provide guidance on material recovery operations which are not covered

by these Standards. The Province may vary the requirements in these Standards on a site-specific basis.

The General Environmental Standards for Municipal Solid Waste Management Facilities also apply to MSW Material Recovery Facilities.

4.0 LEGISLATION AND APPROVALS

The legislative authority for the establishment, development and operation of a municipal waste management system is provided through the *Environmental Protection Act,* Parts IV, V and XI; and the *Municipalities Act,* Part XIII.1.

The information provided in the General - Environmental Standards for Municipal Solid Waste Management Facilities / Systems regarding Legislative Authority; the Certificate of Approval Process; Approval for Other On-Site Activities; Public Notification; and Financial Assurance/ Environmental Insurance applies to Material Recovery Facilities.

A Certificate of Approval to construct and operate a Materials Recovery Facility 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 for all aspects of the facility 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.

4.1 Other On-Site Activities

Approval from the Department is also required for any activities other than recovery of dry recyclable materials.

5.0 ENVIRONMENTAL STANDARDS

The following section outlines requirements for the siting, design, construction, operation, and decommissioning of a Material Recovery Facility. Further information is available in the General Environmental Standards for MSW Waste Management Facilities/ Systems.

Alternate facility designs and technologies that provide for an equivalent or higher level of environmental protection will be assessed on technical merit and evaluated on a case by case basis. However, the assessment of alternate designs may require more time.

5.1 Site Selection

Table I provides some of the Recommended Separation distances for Material Recovery Facility. Separation distances are necessary in order to minimize potential environmental conflicts between non-compatible land uses and the facility. It is advised to exceed these recommendations wherever possible to minimize the possibility of public complaints and environmental issues. The Department may vary requirements depending on the type of material to be recovered, operational procedures, environmental sensitivity and other site-specific conditions.

Table 1: Recommended separation distances for Material Recovery Facilities

Land Use	MRF sites shall not be sited in environmentally sensitive areas (parks, nature reserves, areas where there may be endangered species of plants or animals, wildlife migration corridors, wetlands, etc). Sites shall be established in accordance with municipal zoning requirements.	
Access and Road Restrictions	Access roads shall be accessible year round by the weight and type of vehicles anticipated.	
Flood Plain	The site shall not be located within a 100 year flood plain or in any area which has greater than 1% chance of flooding in any year. Flood risk mapping shall be consulted if available.	
Watersheds	A MRF site shall not be located in a protected water supply area or a protected well field.	
Hydrogeology	Areas where there is a reasonable depth of native soils and no useful groundwater resources are preferred.	
Recommended Separation Distances from the MRF Property Boundary	**Feature**	**Separation Distances (m)**
	Receiving Area	30
	The area (the 15 m closest to the property boundary must be reserved for natural or landscaped screening (berms or vegetative screens))	30
	Residential and Institutional Properties (Examples: public schools, hospitals, churches, public parks and playgrounds)	300
	Industrial and Commercial Property	150
	Right-of Way of a Public Road	100
	The High Water Mark of any Water Course, River, Stream, Water Body, Lake, Pond, Marsh, Bog, Swamp, Tidal Flat, or Similar Area	150
	Drinking Water Supply (Well or Surface Water)	300
Unstable Area	Sites are not to be located within 100 metres of an unstable area.	
Airports	The 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.	
Fire Break	Distance to be approved in consultation with the Fire Commissioner's Office.	

5.2 Site Investigation: Hydrology, Surface Water and Groundwater

Site investigations are undertaken to provide an environmental baseline on regional and local hydrogeology, surface water and groundwater quality/conditions for the proposed site. A summary of site characteristics as they relate to potential transport of contaminants in the environment is required prior to any approval for construction. The factors addressed include: soil and bedrock composition, the hydraulic conductivity, depth to groundwater, direction of groundwater flow, and use of the aquifer for drinking water supplies. Surface water resources are also discussed where relevant and include: the location of on-site and off-site surface water bodies and the use of surface water for drinking water and other purposes. The presence of wetlands, floodplains and sensitive environmental features is also addressed.

Further detail on the content of a site investigation is contained in Section 5.2 of the General Environmental Standards for Municipal Solid Waste Management Facilities and Appendix C

5.3 MSW – Materials Recovery Site/Facility Location and Facility Design

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, showing the location of all on-site facilities and infrastructure.
- 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.
- Consideration shall be given to the amount of material to be processed, the proximity of the facility to collection routes and markets and the availability of transportation. Preferred locations are nearby existing waste disposal sites, or other brownfield sites.

Facility Design

The layout shall include the location of the tipping floor and areas for material handling such as pre-sorting, sorting and storage. The site plan shall indicate roadways, direction for traffic flow, parking areas and buffer zones. There shall be sufficient area for weigh scales for incoming materials and for queuing of trucks at both the weigh scales and at the facility (e.g. in receiving and loading areas).

The facility design shall allow for changes in the interior layout, the addition of new equipment to accommodate population growth in the area served, or program expansion.

The full design of a material recovery facility shall be shown on plans certified by a Professional Engineer and described in written form as per the general environmental standards for MSW management facilities, to allow evaluation and determination of compliance.

6.0 CONSTRUCTION

The Materials Recovery Facility, is required to meet the general environmental standard for construction including an approved design, quality control / assurance protocol and environmentally sound construction practices.

Prior to opening the material recovery facility, the owner and/or operator shall provide to the Department, documentation in the form of a Certificate of Completion, that the site has been constructed as per the approved design, that all facilities and systems are in place and functional, and the site is ready to receive dry recyclables.

7.0 QUALITY CONTROL/ASSURANCE

A description of the quality control/assurance program to be carried out on all aspects of the waste management facility/ system integral to environmentally sound design and performance is required. This requirement includes both construction and operations phases of the facility.

8.0 RECEPTION OF MATERIALS

8.1 Receiving, Inspection and Monitoring

All vehicles delivering material to the site shall be screened to ensure that they are carrying acceptable materials, and weighed if required to determine material quantities for accounting purposes. A waste transport vehicle shall be refused access to the site and facility if it is known to contain unacceptable, hazardous or suspected hazardous material/ waste.

A trained operator shall oversee the unloading of dry recyclables that are delivered to the receiving area and identify any unacceptable materials. Unacceptable materials shall be immediately segregated and removed from the site.

Ideally dry recyclables shall be incorporated into the recovery process on the day of delivery. A maximum of two days processing capacity of materials shall be stored in an enclosed area at any one time. Procedures for receiving and documenting sources, quantities and types of dry recyclables, and directing vehicles to the appropriate area of the site shall be outlined in the operations manual.

8.2 Hazardous or Suspected Hazardous Waste

Suspected hazardous material shall be kept in a designated holding area to facilitate storage, handling, removal and disposal according to regulations.

Details of non-compliant material brought to the facility shall be recorded including: date received; type, quantity, source and owner of the material; name of transport company, contact information and transport vehicle identification.

8.3 Acceptable Dry Recyclables

The material recovery facility shall only accept dry recyclable materials as outlined in the facility Certificate of Approval to operate. The owner/operator shall provide details of the types and quantities of material to be handled at the facility, including the proportions of dry recyclables from residential and industrial, commercial, institutional sources.

Any changes or modification to operations shall be approved by the Department. Any residual products associated with the operation shall be disposed of in a manner acceptable to the Department.

9.0 Facility Operations – Design Considerations

9.1 Facility Sizing and Process Flow

The facility size (dimensions), processing systems, including room for expansion over the anticipated lifespan shall be described. Appropriate systems and protocols shall be in place to manage, monitor and control the material recovery operation. It may be useful to provide a mass balance diagram showing input and output, for example: capacity of the facility, characterization/separation of the waste stream(s), materials flow, final products, distribution of processed materials and residual waste.

The facility design shall include a plan to progressively upgrade process management.

Buildings and access shall be appropriately sized and designed to accommodate throughput, and anticipated traffic.

9.2 Environmental control systems

Design features are required to maintain acceptable air quality, to minimize dust and odour generation, to reduce noise levels and control nuisance such as rodents, flies and litter.

Environmental design controls may include the following:

- prevention of water pooling at the site (ensure proper drainage);
- installation and maintenance of ventilation equipment and air emissions controls; including fans and negative air pressure inside the building;
- provision for water mist for dust suppression; and
- a sprinkler system in case of fire (if needed).

Complementary operational controls would include:

- regular maintenance of the site, systems and equipment;
- good housekeeping practices;
- provision of training and personal protective equipment for employees;
- provision for air quality monitoring and analysis; and
- Effective contingency plans.

9.3 Access Requirements

Material recovery facilities shall be designed to accommodate the type and volume of vehicle traffic anticipated such as heavy equipment, trucks and public vehicles that deliver material and other on-site activities. Access roads shall be maintained (surfaced and drained) to prevent rutting and excessive erosion. The site shall have controlled site entry and exit points to control the types of material received at the site and vehicle movement.

9.4 Receiving Areas

Details of material receiving and storage, including infrastructure such as weigh scales, roadway and parking areas and any facilities for temporary on-site storage shall be clearly described. Consideration shall be given to designing a facility which minimizes long wait times for vehicles delivering material to the site.

Weigh scales are to be approved and functioning pursuant to Weights and Measures Canada Standards for the purpose of weighing the material as it is delivered to the site.

- The receiving and tipping areas shall be within an enclosed building and the tipping floor shall be made of an impermeable, sealed concrete, asphalt or other material as approved by the Department. The floor shall be designed to prevent subsurface soil and potential groundwater contamination and to contain and collect runoff, leachate or drainage of liquids. The floor shall be designed of sufficient thickness and strength to withstand the wear of the hauling / transport vehicles, other heavy equipment and the accumulated recovered materials.

- The receiving area and tipping floor shall be appropriately sized to accommodate extra materials for the second operational shift (for operations running 2 shifts per day) and at least 2 days of incoming waste, without restricting vehicle or equipment movement.

- The floors of the receiving and tipping areas shall be inspected regularly and repaired as needed, consistent with good housekeeping practices.

9.5 Pre-Processing Requirements

The pre-processing requirements and equipment to be used at the facility shall be described. Pre-processing or pre-sorting, includes the receipt and storage of material and preparation of material for sorting.

Material preparation would include, mechanically or manually opening bags to remove material, movement of recyclables over conveyer belts to various areas for manual and or mechanical sorting (use of trommels and magnets, inspection and shredding.

Methods for collection, storage and disposal of residual wastes (bags, plastics, fragments, unrecyclables etc.) resulting from pre-processing shall also be described.

9.6 Post-Processing Requirements

Post-processing operations and any specialised equipment required shall be described. Post-processing of material includes packaging, baling, storage and any other preparations for transport to off-site locations.

9.7 Storage of materials

Designated areas are required for storage of materials that have been received and processed, awaiting delivery to markets. Adequate storage also protects the product from degradation and product contamination. Preferably all materials awaiting transport to market should be stored in an enclosed building or at least under cover to avoid the absorption of moisture (especially fibre materials).

Outside storage of materials should be as brief as possible and done in a way that minimizes contamination (e.g. separated from other materials that could cause contamination, protected from accumulation of dirt and mud). Materials in storage for extended periods of time (greater than one month) should be stored inside.

The size and location of storage areas must not inhibit the flow of traffic or operation of equipment. The storage areas shall be kept free of unprocessed materials and accumulated supplies and equipment.

9.8 Litter Control and Housekeeping

A litter control program shall be implemented which includes regular litter collection on and around the entire site. Open truck loads of dry recyclables transported to and from the site shall be covered by tarpaulin, or a similar material, to prevent loss of material at the site and during delivery. Proper housekeeping practices shall be in place to prevent litter and nuisance problems at the facility. Site location may require that a treed or bermed buffer zone be established between the property boundary and the facility to improve aesthetics.

9.9 Animal, Rodent and Vector Control

An approved rodent, bird, animal and vector control program shall be in place for the lifespan of the facility. The control program shall be approved by the Department.

9.10 Dust and Noise Control

Dust produced by operations such as shredding, baling and screening of recovered waste materials shall be controlled by the installation of dust collection and control equipment such as fans and air scrubbers.

All roads on site shall be properly maintained to minimize the potential for the tracking of dust, mud or wastes from the facility onto access, public or private roads. Suitable dust and noise control measures and systems shall be included in the design and operation of the site.

10.0 OPERATIONS PLANS

10.1 Operations and Maintenance Manual

An operations and maintenance manual shall be developed that will be kept on site and be readily available for use by staff and regulators. The manual shall be prepared by the owner and/or operator and approved by the Department. It shall include the general operations, policies, procedures, monitoring requirements, maintenance and legal requirements of the facility. The facility shall operate in compliance with the provisions of the Certificate of Approval and this manual.

See Section 10.0 of the General Environmental Standards for MSW Management Facilities for further details on the expected content of an Operations and Maintenance Manual/Plan.

10.2 Environmental Health and Safety Contingency Plan

The owner/ operator shall have up-to-date contingency plans in place to effectively handle all reasonably foreseeable emergencies which could result in disruption of facility operations and/or environmental damage. The plan shall describe appropriate mitigation measures required to prevent damage to the waste management facility and the environment.

Bound copies of the contingency plan(s) shall be kept at the facility (ies) with the Operations Manual. Employees shall be familiar with the contingency plan(s) and participate in regular practice response exercises.

Employees 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 developed in consultation with the local Fire Department shall be in place on a continual basis. The Department of Natural Resources shall also be advised in areas where there is a forest fire risk.

The owner and/or operator shall review the contingency plan annually and revise it as required.

11.0 RECORDS AND REPORTING REQUIREMENTS

The General Environmental Standards for MSW Management Facilities describes the variety of records and reporting requirements associated with the construction and operation of a facility. Documentation for a Regional Waste Management Facility/Site would be in a standard format to facilitate reporting. 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.

Operations management reports on daily activity(ies) at a Materials Recovery facility would include the following information:

- identification of generators and transporters of the dry recyclables;
- the origin and quantity of the dry recyclables received, (mass and/or volume);
- the quantity of dry recyclable material stored and processed;
- the type and amount of residual material sent for disposal and the disposal method; and,
- the amount and types of materials sold/redistributed;
- a description of any complaints received; and
- any incident requiring contingency plan implementation.

An annual report shall be prepared by the owner/operator and submitted to the Department. The expected content of an annual report is outlined in the General Environmental Standards for MSW Management Facilities.

Environmental monitoring and reporting requirements are also outlined in the General Environmental Standards and would be set out in the terms and conditions of the Certificate of Approval.

Regional Service Boards may opt to consolidate the reporting requirements for facilities they administer and submit one annual report and or environmental monitoring report(s) to the Department.

Records shall be kept on site for a minimum of two years. All records shall be available for inspection by the Department during the lifespan of the facility.

12.0 Site Safety and Security

A more explicative, but non-exhaustive list of factors important to safe and secure operation of a waste management facility/site is provided in the General Environmental Standards for MSW Management Facilities.

In brief, controlled access, clear signage, and having a sufficient number of well trained personnel in place when the site/facility is open to the public are seen as the central components of safe operations. Adherence to the Operations and Maintenance Manual and Reporting Requirements will also ensure safe practices at the facility/ site.

Working conditions shall always meet or exceed Occupational Health and Safety Guidelines/Standards, and sufficient good quality personal protective equipment shall be provided. Environmental Health and Safety Emergency Contingency Plans shall be well known and practiced by employees. Ongoing public education and awareness will also serve to improve facility efficiency, and decrease overall risk.

13.0 ENVIRONMENTAL MONITORING

An appropriate environmental monitoring program shall be developed as part of the Certificate of Approval process for the facility/ site. The requirements shall be based on an assessment of site investigations, including the hydrogeologic and surface water investigation, and proposed facility operations. Where groundwater and/ or surface water monitoring is required, the monitoring program, shall be designed and conducted by a suitably Qualified Professional and approved by the Department prior to implementation. The Department may develop or adjust the list of parameters and/or monitoring schedule on a site-specific basis.

The General Environmental Standards for MSW Facilities provide further information on possible monitoring requirements which may or may not apply to the Materials Recovery Facility.

All surface water (storm water runoff, or leachate) discharged from the site shall comply with the *Environmental Control Water and Sewage Regulations*, 2003. Additionally, liquid effluents shall not be acutely lethal as determined by the suite of biological Test Methods developed by Environment Canada for this purpose. The Department of Environment and Conservation Policy PD:PP2001-01: *Use of Accredited and Certified Laboratories* applies for sampling analysis.

13.1 Odour management program

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

- identify sensitivity and location of facility users and occupants of adjacent and nearby properties;
- population density;
- planned development in the immediate area;
- climatic features such as prevailing winds direction and speeds, annual rainfall, average seasonal temperatures, humidity and pressure conditions;
- description of the local air shed (the geographic area of potential impact from odours); and,
- geographic features of the proposed site.

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.

The Department may require that a dust and noise monitoring program be implemented at the site.

14.0 DECOMMISSIONING PLAN

The owner/operator shall submit a preliminary decommissioning plan to the Department when applying for a Certificate of Approval. Factors to be considered include site cleanup, repair and rehabilitation, and removal or securing of infrastructure, equipment and access. Controls/contingencies for nuisance including wind-blown debris, litter, rodents, other vectors and illegal dumping may also be required. A detailed decommissioning plan shall be submitted prior to the closure of the site.

The design of the material recovery facility shall take into consideration the requirements of proper closure and decommissioning, and future use of the facility/ site of the site. The plan must be updated whenever significant changes are made to the MRF and submitted to the Department for approval.

The General Environmental Standards for MSW Management Facilities provide further information on required notifications and the expected content of a decommissioning plan. Decommissioning requirements include informing site users and regulators, and installing signage. A decommissioning report and final inspection by the Department is required. Post-decommissioning monitoring, maintenance and reporting shall also be required depending on the final condition of the site upon closure and the proposed future use.

REFERENCES FOR SOLID WASTE MATERIAL RECOVERY FACILITIES

- *Maine Solid Waste Management Rules: Chapter 409 - Processing Facilities*, Maine Department of Environmental Protection.
- *Materials Recovery Facility Processing Cost Model, final Report*, Prepared for the Ontario Ministry of the Environment and Energy and the Environment and Plastics Institute of Canada, Proctor and Redfern Ltd. January 1995.
- *Municipal Decision Maker's Guide to Solid Waste Management, Chapter 6 - Recycling*, United States Environmental Protection Agency, Second Edition August 1995.
- *Municipal Planning Guide for a Successful Waste Reduction and Recycling Program*, Alberta Department of Environmental Protection.
- *Municipal Solid Waste Management Assistance Program Evaluation*, Saskatchewan Department of Environment and Resource Management.
- *Ontario Regulation 103/94*, Industrial, Commercial and Institutional Recycling Programs.
- *Ontario Regulation 101/94*, Recycling and Composing Municipal Waste.
- *Prince Edward Island Environmental Protection Act*, Waste Resource Management Regulations Sections 65 - 67, Recycling Plants.
- Solid Waste Management In New Brunswick - Recycling, New Brunswick Department of Municipal Affairs and Environment.
- *Status Report on MRF Development in Ontario*, R. Graham P. Eng. Director of Engineering RIS Ltd. - Presentation to the Association of Municipal Recycling Coordinators of Ontario, 1994.
- *Municipal Decision Maker's Guide to Solid Waste Management, Chapter 6 - Recycling*, United States Environmental Protection Agency, Second Edition August 1995.
- Design of a Material Recovery Facility (MRF) for Processing the Recyclable Materials of New York City's Municipal Solid Waste, A.J. Dubanowitz. May 2000.
- SHB 2960 Report. Washington's Solid Waste Permit System. Washington State Department of Ecology, November 1998.