

**SAINT LUCIA**

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No. 8 of 2004

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I ASSENT

[L.S.]

PEARLETTE LOUISY,  
*Governor-General.*

*20th April, 2004.*

## **SAINT LUCIA**

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**No. 8 of 2004**

**AN ACT** to provide for the management of waste in conformity with best environmental practices and to provide for matters incidental thereto.

[ ON ORDER ]

BE IT ENACTED by the Queen's Most Excellent Majesty, by and with the advice and consent of the House of Assembly and the Senate of Saint Lucia, and by the authority of the same, as follows :

PART I  
PRELIMINARY

**Short title and commencement**

1. This Act may be cited as the Waste Management Act, 2004 and shall come into force on a day to be fixed by the Minister by order in the *Gazette*.

**Interpretation**

2. In this Act —

“Authority” means the Saint Lucia Solid Waste Management Authority established under section 3;

“authorized officer” means any person appointed under Section 41;

“biomedical waste” includes any solid waste containing human or animal fluids, flesh, bones or other body parts except hair;

“commercial waste” means waste generated by an entity which conducts a business activity during which waste is generated;

“composting” means making the humus-like end-product of the decomposition of organic waste;

“corporation” means persons who conduct industrial, commercial and institutional operations in the course of which waste is generated;

“derelict vehicle” means —

(a) any abandoned or discarded motor vehicle and any part of such motor vehicle; or

(b) any motor vehicle stored or kept in a public place which is in such a dilapidated condition that it cannot be safely used for the purpose of transportation, and any part of such motor vehicle;

“dumping” means discharging wastes into the environment at a site or location other than one approved and permitted under this Act;

“hazardous waste” means any material that belongs to any category specified in Annex I of Schedule 1, unless it does not possess any of the characteristics specified in Annex II of Schedule 1;

“incineration” means the destruction of solid waste by high temperature burning in a furnace designed for such purpose whereby solid waste is essentially reduced to ash, carbon dioxide and water vapour;

“incinerator” means a facility for processing waste through incineration and which is designed and constructed so as to protect human health and the environment from adverse impacts associated with the specific types of waste that are incinerated at the facility, including any pollution control equipment associated with the facility;

“institutional waste” means waste generated from Ministries of Government, schools, health centres, post offices, fire stations and offices of statutory bodies;

“landfill” means a facility for the disposal of solid waste in or on the land and designed and constructed so as to protect human health and the environment from adverse impacts associated with the waste over time, including any pollution control equipment associated with the facility;

“litter” means any solid or liquid material or product or combination of solid or liquid materials or products including any bottles, cans, logs, saw-dust, silt, derelict vehicles, white goods, cartons, packages, packing materials, paper, glass, food, dead animals or carrion, garbage, debris, sand, gravel stone, dirt or any other waste material or any parts of such matter;

“Minister” unless otherwise stated, means the Minister responsible for Health;

“person” includes a body corporate;

“Planning Authority” means the Minister responsible for Physical Development;

“post-closure and remediation” means the process and its duration whereby a site, which has been, but is no longer, used for solid waste management purposes, is rendered fit for other uses;

“prescribed” means prescribed by regulation made under this Act;

“processing facility” means a facility where waste is processed for the purpose of-

(a) reducing the volume of the waste;

- (b) reducing the degree of hazard associated with the waste; or,
- (c) creating or recovering any secondary resource;

“public authority” means any entity specified in Schedule 7;

“public place” means any road, street, footpath, access way, alley, lane, court, thoroughfare, beach, park, garden, river, sea, natural water courses, drain, wharf, pier, jetty, forest, burial ground and any other place in the open air to which the public has access with or without payment;

“quarantine waste” includes any waste imported into or landed in the country by any ship or aeroplane that comprises, or which contains, any food, vegetable, meat or dairy product, or any part of such matter;

“radioactive waste” includes any waste that is radioactive;

“recycling” means the process by which a secondary resource is created from waste;

“reuse” means the use of waste in any manner that does not present a threat to human health, safety or the environment, but does not include the use of waste in any manufacturing process whereby a secondary resource is created;

“Scheduled agencies” means the agencies specified in Schedule 2;

“scrap metal” includes old or scrap copper, brass, wire rope or cable, batteries, metal debris, or junked, dismantled, or wrecked or derelict motor vehicles, or parts thereof, including any —

- (a) iron, steel, or other old or scrap ferrous or nonferrous material,
- (b) substance which contains any such material;

“secondary resource” means the material or matter which results from any process by which waste is rendered into any form that is suitable for use providing that the rendered material or matter, or use of such material or matter does not present a threat to human health, safety or the environment;

“ship” means any —

- (a) seagoing vessel of any type whatsoever; and
- (b) floating craft, with the exception of an installation or device engaged in the exploration and exploitation of the resources of the seabed and the ocean floor and the subsoil thereof;



“ship-generated waste” means any waste generated on a ship or other sea-going craft;

“solid waste” includes garbage, refuse, organic waste, scrap metal, silt, back filling material, construction and demolition material and other solid materials discarded from-

- (a) residential, industrial, commercial or government establishments or operations; and
- (b) public or community activities,

*but* does not include solid or dissolved material in domestic sewage, or other substances in water sources, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants;

“waste” unless otherwise stated, includes any material solid or liquid discarded by the owner of the material, whether or not the material is in the same form as it was when it came to be in the possession of the owner, and includes any derelict vehicle;

“waste management facility” means any licensed facility for managing waste by storing or processing, including a processing facility for the creation or recovery of a secondary resource, but does not include a location or facility where waste is stored for less than 5 days;

“waste management policy stakeholders” means any persons and organisations in Saint Lucia which are considered by the Planning Authority either as likely to be significantly affected by waste management policy or to be possessed of special expertise or qualifications which make them competent to advise on the development of waste management policy but does not include the authority and Ministries, departments or other units of the government;

“white goods” means disused and abandoned refrigerators, washing machines and other domestic appliances.

## PART II

### THE SOLID WASTE AUTHORITY

#### **Establishment of the Solid Waste Authority**

3.— (1) There is hereby established a body corporate to be known as the Saint Lucia Solid Waste Management Authority.

(2) The provisions of Part I of Schedule 3 shall have effect in relation to the constitution, duties and powers of the Authority and all matters incidental to the operations of the Authority.

**Vesting of solid waste management facilities in the Authority**

**4.**— (1) The solid waste management facilities specified in Schedule 4, including the estate and the rights of the Crown in the land on which it is situated, including the surrounding land used at the commencement of this Act for the purposes of those facilities shall, subject to subsection (2), be vested in the Authority from the commencement of this Act.

(2) The land shall vest in the Authority for so long only as the facilities continue to be used for the purposes of solid waste management and for the period of closure, post-closure and remediation on the cessation of use for those purposes.

(3) Subject to subsection (4), the Authority may not alienate any such land or create any right over such land, whether or not the alienation or transfer is for valuable consideration, save under the authority of a Cabinet Conclusion approving that alienation or transfer, and any such Conclusion may require that all or any part of any valuable consideration for the alienation or transfer shall be paid over into the Consolidated Fund.

(4) The Authority may, for the better discharge of its functions and without the authority of a Cabinet Conclusion, grant permission revocable at will, for the use of land vesting in it and may confer, for valuable consideration, contractual rights to use the land, but such permission or contractual rights shall not endure longer than the period of the vesting of the land in the Authority.

**PART III**

**WASTE MANAGEMENT PLANNING**

**Formulation of solid waste inventory and National Waste Management Strategy**

**5.** — (1) Within three months of the commencement of this Act, the Authority shall compile an inventory and characterisation of the solid waste generated in Saint Lucia according to —

- (a) type;
- (b) volume; and
- (c) sector of generation.

- (2) The solid waste inventory and characterisation shall —
- (a) identify the types and characteristics of waste generated in Saint Lucia;
  - (b) identify the total tonnage of solid waste generated in Saint Lucia;
  - (c) identify the proportions of waste according to specific classifications of solid waste;
  - (d) estimate the proportion of total solid waste generated by the residential sector, the tourist sector, and, the industrial, commercial and institutional sector exclusive of tourism.

(3) The solid waste inventory and characterisation shall be revised at least once every five years.

(4) The Authority shall within one year of the commencement of this Act, prepare a National Waste Management Strategy.

(5) The Authority shall ensure the broadest consultation in the preparation of the National Waste Management Strategy, and in particular, shall consult with the Scheduled agencies and with waste management policy stakeholders to the extent that their interests are, in the opinion of the Minister, likely to be affected.

#### **Content and structure of National Waste Management Strategy**

6. — (1) The National Waste Management Strategy shall include —
- (a) a summary of the waste inventory and characterisation of waste compiled pursuant to section 5;
  - (b) an evaluation of historic, current or proposed activities that impact upon the volume or type of waste generated in Saint Lucia;
  - (c) a review of national waste diversion and reduction options;
  - (d) an evaluation of national environmental and pollution control policies that may impact upon the nature or volume of waste generated in Saint Lucia;
  - (e) an implementation programme outlining mechanisms, programmes, policies, and strategies that are to be established to ensure that waste management is carried out in such a manner so as not to adversely impact on human health or the environment;

- (f) a national emergency plan in conformity with the requirements of the National Disaster Preparedness Plan under the Disaster Preparedness Act No. 13 of 2000 or any enactment replacing it;
  - (g) any other matter which in the opinion of the Authority is relevant to the effective management of waste.
- (2) The implementation programme developed under subsection (1)(e) shall amongst other things establish —
- (a) standards, requirements and procedures for the management of all waste, including the generation, handling, storage, treatment, transport and disposal of all types of waste;
  - (b) requirements and procedures for the issuance, monitoring and enforcement standards for the construction or operation of waste management facilities or equipment;
  - (c) physical infrastructure requirements to provide waste management services;
  - (d) measures for addressing dumping of litter, wastes and derelict vehicles;
  - (e) outline financing and cost recovery mechanisms to ensure the financial viability of all waste management activities;
  - (f) outline measures for effective training of staff involved in solid waste management and effective public education and awareness regarding solid waste management.
- (3) The National Waste Management Strategy shall, in particular —
- (a) establish standards and procedures to be implemented in the reduction, recycling of, recovery, reclaiming and re-use of waste and the use of recycled substances;
  - (b) identify methods by which hazardous and bio-medical wastes and other specified classes of solid waste substances are to be managed;
  - (c) identify methods by which solid waste is to be transported in such a way that it does not present a threat to human health, safety or the environment;
  - (d) establish standards and procedures for the location of waste disposal sites and plants;

- (e) establish standards and procedures for the safe removal, and disposal of litter;
- (f) classify, for the purpose of waste management, premises from which waste is generated;
- (h) classify, for the purposes of disposal and treatment, different types of waste;
- (i) establish targets for the reduction of waste to be achieved and commencement dates, with the objective of-
  - (i) reducing by 20 percent all solid waste by January 1, 2010, through source reduction, recycling and composting activities;
  - (ii) providing further reductions in solid waste at rates of no less than 5% per decade after the year 2010 until such time as a 50% reduction is achieved through source reduction, recycling and composting activities;
- (j) design waste management measures in such a manner that the costs arising from pollution are met by the polluters;
- (k) subject to paragraph (i), design waste management measures in such a manner as to recover costs from those who benefit from those measures; and
- (l) identify suitable enforcement mechanisms and appropriate mechanisms to ensure the implementation of the National Waste Management Strategy, including, where appropriate, the use of economic instruments.

(4) In preparing the National Waste Management Strategy, the Authority shall undertake an evaluation of the social, environmental and economic impacts of the Strategy, and the findings of such an evaluation shall be contained in the Strategy submitted to Cabinet for approval pursuant to section 7.

**Approval of National Waste Management Strategy**

7. — (1) The Authority shall first submit the National Waste Management Strategy for public review and comment, and for this purpose shall —

- (a) by notice in the *Gazette* and by placement of a notice for two consecutive weeks in at least two newspapers published regularly in Saint Lucia;

- (b) by broadcast for at least three occasions on at least two radio stations and one television station based in Saint Lucia,

invite any member of the public to submit views on the strategy and advise the public —

- (i) where copies of the National Waste Management Strategy may be obtained for review;
- (ii) the address to which any comments on the National Waste Management Strategy may be submitted; and
- (iii) the closing date for making any submissions.

(2) The Authority shall allow a period of at least thirty days and no more than forty-five days for the receipt of comments on the National Waste Management Strategy under subsection (1).

(3) After receipt of comments from the public, and any changes made which the Authority considers desirable, the Authority, through the Planning Authority shall submit the National Waste Management Strategy to Cabinet for approval.

(4) Cabinet may either —

- (a) approve the National Waste Management Strategy, with or without amendments; or
- (b) refer the Strategy back to the Authority with a recommendation to correct any deficiency.

(5) Where Cabinet refers the Strategy back to the Authority, the Authority shall take all necessary measures to give effect to the recommendations of Cabinet within such time as Cabinet may specify for that purpose.

(6) The National Waste Management Strategy, once approved by Cabinet, shall be binding on any person or authority discharging a function under this Act and such person or authority shall comply with the requirements of the Strategy.

(7) The National Waste Management Strategy, once approved by Cabinet, shall provide the basis for evaluating —

- (a) waste management options relating to all development approvals, and

(b) the licensing of waste management facilities under this Act.

**Amendment of National Waste Management Strategy**

**8.** — (1) The Authority shall before any component or part of the National Waste Management Strategy is amended, publish a notice of intention to amend the Strategy, specifying –

- (a) the area in respect of which the Strategy is intended to be amended;
- (b) the reasons for such amendment;
- (c) that submissions on the amendment may be made in writing by any person.

(2) In addition to the placement of any public notice as provided under subsection (1), the Authority may establish a consultative process with the Scheduled agencies and waste policy stakeholders

(3) A notice published pursuant to subsection (1) shall be published in like manner as a notice published for purposes of section 7.

**Review of National Waste Management Strategy**

**9.**— (1) The Planning Authority shall, in consultation with the Authority and the Minister keep the National Waste Management Strategy under review and, in any event, shall undertake a comprehensive review of the Strategy within five years of its approval by Cabinet to ensure that —

- (a) it complies with obligations under relevant international and regional agreements;
- (b) it is responsive to the needs of Saint Lucia in waste management;
- (c) it is within the technical, financial and human resources and capabilities of Saint Lucia;
- (d) it includes consultation with the waste management policy stakeholders, to the extent that their interests are, in the opinion of the Planning Authority, likely to be affected;
- (e) it contributes to a net improvement in the quality of life and in the quality of the environment.

(2) Any review of a National Waste Management Strategy undertaken under this section, shall be through broad-based consultations with the public and waste management policy stakeholders, to the extent that their interests are, in the opinion of the Planning Authority, likely to be affected.

#### PART IV

##### WASTE MANAGEMENT FACILITIES – LICENSES

###### **Approval process for establishment of waste management facilities**

**10.**— (1) Any person desirous of establishing a waste management facility shall apply, in the prescribed manner, to the Planning Authority for —

- (a) an approval in principle;
- (b) a full approval,

prior to the commencement of the construction of the facility.

(2) This section shall not apply to a waste management facility to which section 22 applies.

###### **Appraisal process**

**11.**— (1) Upon receiving an application for an approval in principle, the Planning Authority shall commence the appraisal process by referring the notification to the Scheduled agencies and by undertaking a preliminary screening to determine whether an environmental impact assessment is required and the scope of such an assessment.

(2) Within ninety days of receiving an application under this section, the Planning Authority shall, after considering any comments from the Scheduled agencies, in appraising and determining whether —

- (a) there are issues which require further information to be provided by the applicant;
- (b) an environmental impact assessment is to be required, and
- (c) whether that assessment is to comprise a comprehensive environmental impact assessment report.

(3) Where the Planning Authority determines that further information is required, the Planning Authority shall advise the applicant in writing of the further information required, and any response of the applicant



purporting to supply that further information shall be treated as a continuation of the proposal and additional ninety days shall be permitted for the evaluation by the Planning Authority following the receipt of the additional information from the applicant.

(4) Following the completion of the appraisal process, the Planning Authority shall advise the applicant whether a comprehensive environmental impact assessment report is required.

(5) If a comprehensive environmental impact assessment report is required, the Planning Authority shall provide the applicant with Terms of Reference for the report, and thereafter the applicant shall undertake, at his or her own expense, a study and produce a report which complies with such Terms of Reference.

**Review of environmental impact assessment reports**

**12.**— (1) The applicant shall submit, within any time frame stipulated in the Terms of Reference, the comprehensive environmental impact assessment report to the Planning Authority for review.

(2) In reviewing the report, the Planning Authority shall consult with the Scheduled Agencies and may, where necessary, request the applicant to submit additional information.

(3) Having reviewed the report and any additional information that may be submitted, the Planning Authority may either —

- (a) accept the report, with or without conditions or amendments;
- (b) require the applicant to complete additional work on the environmental impact assessment to meet specific concerns the Planning Authority identifies; or
- (c) reject the report if the applicant has not adhered to the Terms of Reference provided by the Planning Authority.

(4) Where required, the applicant shall undertake additional work to meet the concerns of the Planning Authority and submit it to the Planning Authority.

(5) Where the Planning Authority accepts a report, it shall inform the applicant in writing and advise him or her to apply in the prescribed form for a Full Planning Approval.

**Granting of Full Planning Approval**

**13.**— (1) Upon receipt of an application for Full Planning Approval, the Planning Authority may —

- (a) approve the proposed development, with or without conditions; or
- (b) reject the proposed development.

(2) The conditions which the Planning Authority may impose on the applicant and provided for in the environmental impact assessment report may include —

- (a) a monitoring programme;
- (b) a protection plan;
- (c) mitigation measures.

**Monitoring and enforcement of the conditions of Full Approval**

**14.**— (1) It shall be the responsibility of the applicant to implement any monitoring programme, protection plan, or mitigation measure constituting a condition of a full approval granted under section 13.

(2) The Planning Authority or any person authorised by it shall conduct any inspection necessary to determine whether the design, development, construction, operation, or abandonment of any undertaking or activity is undertaken in accordance with a monitoring programme, protection plan, or mitigation measure constituting a condition of any approval granted under section 13, and may issue an order to rectify any deficiency which may exist.

(3) Where an inspection reveals any deficiency, the Planning Authority or person authorised by it, may issue the applicant an order requiring him or her to —

- (a) stop work on any undertaking or activity;
- (b) restore the site to its original condition with a further order for costs to be borne by the applicant;
- (c) carry out any improvement or remediation work on the site with a further order for costs to be borne by the applicant.

(4) Every person who —

- (a) undertakes or constructs any facility prior to obtaining Full Approval under section 13;
- (b) contravenes a condition of approval under section 13;
- (c) contravenes any order made under this section,

commits an offence and is liable on summary conviction to a fine of not more than one hundred and twenty thousand dollars, or imprisonment for a term of not more than two years.

**Environmental impact assessment guidelines**

**15.** The Planning Authority may issue guidelines —

- (a) on the procedures for screening applications for purposes of sections 11, 12, 13 and 14, and in particular for carrying out an environmental impact assessment;
- (b) for the development of Terms of Reference for any environmental impact assessment under this Act;
- (c) on the procedures for undertaking any monitoring programme, protection plan or mitigation measures, in relation to an application for Full Approval under this Act.

**Waste management plans required for development applications**

**16.—** (1) In its consideration of any development proposal other than a proposal under section 10, the Planning Authority shall in addition consider issues relating to waste generation and waste management and the requirements of the National Waste Management Strategy under this Act.

(2) In furtherance of section 18, the Planning Authority shall require the applicant in any development proposal, to estimate the amount of waste expected to be generated during pre-construction, construction and in the course of its operation when constructed.

(3) When submitting an application for a commercial development, the applicant shall, in addition, be required to identify action to be taken to minimize waste generation, and to maximize reuse, recycling and composting, during pre-construction and construction of the facility and in the course of its operation when constructed.

(4) A specific management plan will be required for any hazardous wastes which may be generated during construction or operation of any facility.

**Prohibition on unauthorized disposal of waste**

**17.**— (1) No person shall —

- (a) deposit or knowingly cause to deposit waste, including *silt, construction* and demolition material in or on any land, foreshore, rivers or river banks in contravention of this Act;
- (b) construct or operate any waste management facility without a Waste Management Facility License; or
- (c) treat, keep or dispose of waste in a manner likely to cause pollution of the environment or harm to human health.

(2) Any person who contravenes this section, commits an offence and is liable on summary conviction —

- (a) in the case of an individual, to a fine of not more than fifty thousand dollars or imprisonment for not more than two years;
- (b) in the case of a corporation, to a fine of not more than two hundred and fifty thousand dollars.

**Prohibition on unauthorized removal of waste**

**18.**— (1) A person —

- (a) who removes any waste from a sanitary landfill or from a place under the control of the Authority commits an offence;
- (b) who interferes or tampers with the operation of any sanitary landfill or any place where waste is stored or kept by the Authority commits an offence;
- (c) to whom a request to produce a document or to enter an appearance and make and sign a statement or furnish information who fails without reasonable excuse to comply with such requisition commits an offence;
- (d) who knowingly supplies any false or misleading information with respect to any levy or fee payable under this Act commits an offence.

(2) A person who commits an offence under subsection (1) shall be liable on summary conviction —

- (a) in the case of an individual to a fine of five thousand dollars or imprisonment for a term of six months;
- (b) in the case of an agent or employee of a company to a fine of ten thousand dollars or imprisonment for a term of one year.

#### **Waste Management Facility License**

**19.**— (1) Subject to section 21, no person shall operate a waste management facility unless that person is a holder of a Waste Management Facility License issued in accordance with this Act.

(2) Any person who desires to operate a waste management facility shall, in addition to complying with sections 10 to 14, apply to the Planning Authority for a Waste Management Facility License in accordance with section 20.

(3) In addition to the requirements of subsection (1), an applicant shall submit together with their application, a disaster preparedness response plan indicating the actions that the applicant will take, during the construction or operation of the facility, in the event of an accident, a spill or a natural disaster.

(4) An applicant who submits a disaster preparedness response plan shall, at least not later than March of every year following the year of submission, review the disaster preparedness response plan to ensure that it remains in conformity with this Act.

#### **Application for a Waste Management Facility License**

**20.**— (1) An application for a Waste Management Facility License shall be made to the Planning Authority in the prescribed form and shall, in addition to the documents referred to in section 19 be accompanied by —

- (a) the prescribed fee; and
- (b) an environmental protection plan, addressing each of the issues set out in Schedule 5.

(2) The Planning Authority shall grant the Waste Management Facility License applied for within sixty days of the date on which all information necessary to process the application is received unless the Planning Authority is satisfied that denying the application —

- (a) is necessary for the purpose of preventing pollution of the environment, harm to human health, or serious detriment to the amenities of the locality;
- (b) if, in conformity with the National Waste Management Strategy, the Planning Authority considers that the approval may result in the proliferation of waste management facilities in excess of the needs of Saint Lucia.

(3) The Planning Authority may, refuse to issue a license for the operation of a landfill or incinerator for the purpose of accepting or processing waste on contract if he or she considers that such facilities ought to be reserved for operation by the Authority.

(4) The Planning Authority shall, before issuing a license under this section —

- (a) refer the application to the Scheduled agencies within fifteen days of receiving it, for written comments;
- (b) consider any submission or representation made by the Scheduled agencies on the application;
- (c) ensure as far as practicable that affected landowners have been consulted and that there is consent to those aspects of the proposed activities or development which may require such consent.

(6) A Waste Management Facility License shall expire on such date, not being later than one year after the date of issue, as the Planning Authority may specify and is renewable, and, an application for renewal shall be made in accordance with this section.

**Existing facilities deemed to be Licensed**

**21.**— (1) Subject to subsection (2) and without prejudice to the requirements of any other law which may be applicable to the owner of an existing waste management facility, such owner shall be deemed at the date of the commencement of this Act to hold a Waste Management License as if issued under this Act.

(2) A license referred to in subsection (1) shall expire one year after the commencement of this Act.

**Conditions of Waste Management Facility License**

**22.**— (1) A Waste Management Facility License shall be issued subject to the following conditions —

- (a) it shall specify the parcel of land on which the holder is licensed to operate a waste management facility; specify as a condition of the License the land on which the licensee is licensed to operate a waste management facility, and the licensee shall apply for a separate license in respect of any land on which he or she may wish to establish other waste management facilities;
- (b) the holder shall comply with the general design and operating standards for waste management facilities specified in Schedule 5, 6, 8 and 9;
- (c) to such conditions as appear to the Planning Authority to be appropriate for the purpose of conformity with the National Waste Management Strategy under this Act.

(2) A Waste Management Facility License issued for use on land on which a planning permission is required under any enactment is conditional on the grant of such a planning permission.

(3) The Planning Authority may, in issuing a Waste Management Facility License, specify conditions for the management of waste during the construction, operation or decommissioning of any facility.

(4) A Waste Management Facility License shall specify in respect of each of the conditions specified in the License, the authority responsible for monitoring compliance with the conditions by the holder.

(5) Subject to sections 27(7) and 28, a holder who fails to comply with the conditions of the License under this section, commits an offence and is liable on summary conviction to a fine of not more than one hundred and twenty thousand dollars or imprisonment for not more than two years.

**Inspection of Waste Management Facility License**

**23.** A holder of Waste Management Facility License shall on request by the Planning Authority or any authorised officer produce his or her licence for inspection.

**Waste Haulage License**

**24.**— (1) Subject to subsection (2) and to section 28, no person shall transport waste for reward unless that person is a holder of a Waste Haulage License issued by the Authority.

(2) The provisions in subsection (1) do not apply to the transportation of —

- (a) household waste, including bulky items such as white goods, by the owner or tenant of the said property where the waste was generated;
- (b) waste generated by activity in the vehicle in which the waste is being transported;
- (c) waste under such other exempted circumstances as may be prescribed by Regulation.

(3) An application for a Waste Haulage License shall be made to the Authority in the prescribed form and accompanied by the prescribed fee.

(4) The Authority shall consider and may issue a Waste Haulage License within sixty days of the date on which the application is received, unless the Authority is satisfied that denying the application is necessary for the purpose of preventing —

- (a) pollution of the environment;
- (b) harm to human health or safety; or
- (c) any danger or hazard to public highways or traffic.

(5) The Authority shall, before issuing a Waste Haulage License —

- (a) immediately refer the application to the Scheduled agencies for written comments and the Scheduled agencies shall respond within 30 days; and
- (b) consider any submission or representation made by the Schedule agencies in relation to the application.

(6) A Waste Haulage License shall be issued subject to such conditions as appear to the Authority to be appropriate for the purposes of conformity with the National Waste Management Strategy under this Act including —



- (a) requirements relating to the maintenance of vehicles and all equipment utilized in waste haulage in a suitable and satisfactory operating condition;
- (b) requirements for the management of wastes during transportation to ensure the coverage of waste in the vehicle at all times sufficient to ensure that waste cannot blow out, fall or otherwise leave the vehicle except when deliberately deposited at a waste management facility permitted to accept the waste;
- (c) requirements concerning the maintenance of appropriate vehicle insurance;
- (d) requirements concerning the maintenance of insurance sufficient to provide for the cleaning up of spills or other polluting accidents that might occur;
- (e) minimum requirements for driver qualification;
- (f) minimum requirements for training of drivers in the management of accidents and disasters.

(7) In addition to the provisions of subsection (6), a Waste Haulage License shall specify as a condition of the licence, the waste management facility or facilities to which the transportation of waste is permitted.

(8) A Waste Haulage License shall expire on such date, not being later than one year after the date of issue, as the Authority shall specify and is renewable and, an application for renewal shall be made in accordance with this section.

(9) Nothing in this Act exempts the owner or operator of any vehicle from the requirements of any other enactment.

(10) Any holder of a Waste Haulage License who fails to comply with the conditions of the Waste Haulage License commits an offence and is liable on summary conviction to a fine of not more than fifty thousand dollars or imprisonment for not more than six months.

(11) The Authority shall annually publish or cause to be published in the *Gazette* the names of the holders of Waste Haulage License.

**Waste Haulage License to be displayed**

**25.** Every holder of a Waste Haulage License shall keep it on the vehicle in such a position that the License may be easily seen from the exterior of the vehicle.

**Suspension and cancellation of Licenses**

**26.** — (1) In this section, “off-License period” means, the period during which a License is suspended or cancelled, but such period ceases on the expiry of a suspension.

(2) The Planning Authority or the Authority may suspend or cancel a Waste Management Facility License or a Waste Haulage License as the case may be, in the event of a violation of a condition of such License, which violation poses an imminent danger of environmental damage.

(3) The Planning Authority or the Authority may give notice to a holder of a Waste Management Facility License or Waste Haulage License requiring the holder to remedy the violation within a period of fifteen days and during that period, the holder’s License shall be suspended and, at the expiry of such period, the Planning Authority or the Authority as the case may be, may cancel a License, if the holder fails to remedy the violation.

(4) Where a Waste Management Facility License is suspended or cancelled by the Planning Authority, the holder of the License shall be responsible, during the off-License period, for the security of all waste, property and equipment affected by the suspension or cancellation of the License, and the authorisation of waste management under the suspended or cancelled License shall apply notwithstanding the suspension or cancellation.

(5) The Planning Authority may at any time during the period of suspension or after the cancellation of a License require the holder to allow the collection of any waste as directed.

(6) A holder of a suspended or cancelled License who fails to secure waste, property or equipment or who fails to allow the collection of waste commits an offence and is liable on summary conviction to a fine of not more than one hundred thousand dollars or imprisonment for not more than two years or both.

(7) Where the Authority suspends or cancels a Waste Haulage License, the Authority shall give directions as to the waste management facility at which any waste shall be deposited and the holder of such suspended or cancelled License as the case may be, shall comply with those directions.

(8) A holder of a suspended or cancelled license who fails to comply with directions of the Authority or to allow the collection of waste commits an offence and is liable on summary conviction to a fine of not more than thirty-five thousand dollars or imprisonment for not more than six months or to both.

#### **Contingency Plans**

**27.**— (1) The Authority shall, subject to the directions of the Planning, Authority prepare and maintain contingency plans for —

- (a) the restoration of waste management services following a hurricane or fire;
- (b) actions to be taken in the event of landfill flooding, waste haulage vehicle accident, spillage of waste, and other disruptions to daily waste management services.

(2) In preparing the contingency plans, the Authority shall seek to ensure that those plans are in conformity with the National Disaster Preparedness Response Plan under the Disaster Preparedness Act No. 13 of 2000 or any enactment replacing it.

#### **Liability in the event of accidents**

**28.**— (1) In the event of any harm to human health, safety or the environment caused through the failure of a holder of a Waste Management Facility License or Waste Haulage License to exercise due diligence in the management or transportation of any waste, that holder shall be liable at the suit of —

- (a) any person injured, for damages; and
- (b) the Crown for -
  - (i) compensatory damages for loss to Crown property; and
  - (ii) compensation to the Crown for its expenses in mitigating the harm to human health, safety or the environment.

(2) In the event of any harm to human health, safety or the environment caused through failure of the holder of any Waste Management License or Waste Haulage License to exercise special care in the management or transportation of any waste during a situation caused by any accident or in times of emergency, that holder of a License or permit shall be liable in the manner stated in subsection (1).

(3) The onus of proving the exercise of due diligence or special care, as the case may be, under this section lies on the holder of the License.

(4) In the event of a spillage of waste in the course of the transportation of that waste by the holder of a Waste Haulage License that holder shall promptly have the spillage cleaned up and transported to a waste management facility permitted to accept the waste.

(5) If no waste management facility is available which is permitted to accept the waste, the operator of any waste management facility to which the holder of the Waste Haulage License transports the waste shall co-operate with that holder to ensure the safe storage of the spilled material and the management of the spilled material until a waste management facility becomes available which is permitted to accept the waste.

(6) Any costs reasonably incurred by the operator of the waste management facility who temporarily stores waste under this section shall be met by the holder of the Waste Haulage License.

(7) Any action by the operator of a waste management facility under subsection (5), shall be deemed to comply with the terms of the Waste Management License under which that waste management facility is operated.

#### **Powers of Planning Authority during Emergency**

**29.**— (1) During any state of emergency declared under the Constitution of Saint Lucia, the Planning Authority may require any person to take any action that the Planning Authority considers reasonably necessary for the safe management of waste.

(2) Whether or not a state of emergency exists, in the event that at any time there is no holder of a Waste Management Facility License or Waste Haulage License, as the case may be, available for the

management or transportation, as the case may be, of any solid waste needing such management or transportation, the Planning Authority shall be responsible for ensuring the management or transportation, as the case may be, of such waste, and any person acting under the authority of the Planning Authority shall while so acting, be authorised to manage or transport, as the case may be, any solid waste.

(3) Any person acting pursuant to a requirement under subsection (1) or the authorisation under subsection (2) is entitled to recover from the Crown expenses reasonably incurred by that person in so acting.

## PART V

### WASTE MANAGEMENT OPERATIONS

#### **Prohibition on the importation of wastes**

**30.**— (1) No person shall import into Saint Lucia any waste other than —

- (a) waste governed by the Marine Pollution Management Act, 2003, imported under conditions authorised by that Act;
- (b) waste generated on board any aircraft landing in Saint Lucia no earlier than twenty-four hours before the time of such landing;
- (c) any secondary resource which is imported under conditions prescribed by regulation for the purposes of any manufacturing process.

(2) Any person who imports any waste contrary to this section commits an offence and is liable —

- (a) on summary conviction to a fine of not more than two hundred and fifty thousand dollars; or
- (b) on indictment to imprisonment for not more than five years and a fine of not more than one million dollars;

(3) No person shall import into Saint Lucia any hazardous waste other than waste governed by the Marine Pollution Management Act, 2003.

#### **Liability for and ownership of waste**

**31.**— (1) Where waste, is moved from a place occupied by the owner of the waste to a place occupied by another person with the consent of

the owner of the waste and of that other person, ownership and possession of the waste passes, in the absence of agreement to the contrary, to that other person at the time when the waste is moved from the property of the original owner of the waste.

(2) Where waste which is in any container, is moved from that container or detached and placed in or on, as the case may be, another person's container or property with the consent of the owner of the waste and of that other person, ownership and possession of the waste passes, in the absence of agreement to the contrary, to that other person at the time when the solid waste is moved from the original container.

(3) When waste is being transferred from any property or container, the person undertaking the transfer of the waste shall —

- (a) ensure that the transfer is undertaken in such a manner so as to prevent the risk of harm to human health, safety or the environment; and
- (b) be liable for any harm to human health, safety or the environment that results from the transfer of the solid waste.

**Requirements for waste handling, separation and processing**

**32.—** (1) Every occupier of land and every person in control of a vehicle shall comply with any requirements —

- (a) for waste handling, separation and processing; and
- (b) prohibiting the disposal of specific types of waste for which a reuse, recycling or composting alternative is available,

which may be prescribed under this Act or regulations made under the Act —

- (i) by the Minister or
- (ii) by the Planning Authority.

(2) Any person who fails to comply with any requirement prescribed under this Act, or regulations made under the Act, or imposed by the Minister or the Planning Authority, commits an offence and is liable on summary conviction to a fine of not more than fifty thousand dollars or to imprisonment for not more than one year or to both.

**Industrial, commercial and institutional waste**

**33.**— (1) Any person who conducts industrial, commercial or institutional operations in the course of which waste is generated shall make his or her own arrangements for waste management, and shall ensure that any waste generated does not present a risk to human health, safety or the environment.

(2) Any person who conducts industrial, commercial, institutional operations in the course of which waste is generated is prohibited from the use of waste storage containers provided for use by households and agencies approved by the St. Lucia Solid Waste Management Authority.

(3) For the purpose of giving effect to the requirements of subsection (1), a person who conducts industrial, commercial or institutional operations in the course of which waste is generated may, in addition to or instead of contracting with holders of Waste Haulage Licenses transport waste to a waste management facility themselves, subject to meeting the following requirements —

- (a) relating to the maintenance of vehicles and all equipment utilized in waste haulage in suitable and satisfactory operating condition;
- (b) for the management of wastes during transportation to ensure the coverage of waste in the vehicle at all times sufficient to ensure that waste cannot blow out, fall or otherwise leave the vehicle except when deliberately deposited at a waste management facility permitted to accept the waste;
- (c) concerning the maintenance of appropriate vehicle insurance;
- (d) concerning the maintenance insurance sufficient to provide for the cleaning up of spills or other polluting accidents that might occur;
- (e) for minimum driver qualification;
- (f) for minimum training of drivers in management of accidents and disasters.

(3) Any person who, contrary to this section dumps or causes to be dumped waste, commits an offence and is liable on summary conviction to a fine of five hundred thousand dollars or imprisonment for five years or both.

(4) In the event that appropriate facilities are not available in Saint Lucia for managing any waste including hazardous waste, persons who conduct industrial, commercial or institutional operations in the course of which waste is generated shall be responsible for the safe management of the waste and for the export of the waste to a facility approved by the Planning Authority.

**Waste storage requirements**

**34.**— (1) Every occupier of premises in which waste is at any time stored shall store that waste in containers that prevent the escape of wastes, liquids or objectionable levels of odour, and which prevent infestation by pests or vermin.

(2) Any occupier of premises on which waste is generated shall comply with such schedule as may be prescribed by regulation for making that waste available for collection for transportation to a waste management facility.

(3) A holder of a motor omnibus license issued under the Motor Vehicles and Road Traffic Act No. 10 of 2003 or any enactment replacing it, shall ensure that any litter generated on his or her omnibus is properly disposed of.

(4) For purposes of subsection (3), the holder of a motor omnibus license —

- (a) may prohibit eating and drinking on the omnibus;
- (b) shall provide or cause to be provided receptacles into which any litter is to be deposited or stored before proper disposal at a waste management facility.

(5) A holder of a vendor's License issued under the Castries Corporation Act No. 22 of 1967 or any enactment replacing it, shall ensure that any litter generated in or near their trading place is properly disposed of.

(6) For purposes of subsection (5) the holder of a vendor's License shall provide or cause to be provided receptacles into which any litter is to be deposited or stored before proper disposal at a waste management facility.



(7) Any person who contravenes this section commits an offence and is liable on summary conviction to a fine of five thousand dollars and in the case of a subsequent offence to a fine of ten thousand dollars or to imprisonment for six months or to both.

#### **Management of used oil**

**35.**— (1) Within twelve months after the commencement of this Act, the Authority shall prepare a scheme, in consultation with importers and distributors of oil, for the establishment of a used oil management system to provide for the environmentally-secure management of used oil generated in Saint Lucia.

(2) The Authority shall submit the scheme prepared pursuant to subsection (1) to the Planning Authority for approval.

(3) The Planning Authority may approve the scheme, with or without amendment and thereafter the scheme shall be incorporated into the National Waste Management Strategy developed pursuant to section 5.

(4) With effect from one year after the scheme is approved, the operator of any garage, facility selling motor oil and petroleum products or service station, shall provide used oil storage facilities and equipment for pumping out used oil, which equipment shall meet any prescribed standards.

(5) After the scheme is approved and incorporated into the National Waste Management Strategy, the Planning Authority shall not grant development approval for the construction of any garage, facility selling motor oil and petroleum products, or service station which does not have in its plans, construction for used oil storage facilities and equipment for pumping out used oil, which equipment shall meet any prescribed standards.

#### **Littering and illegal dumping of wastes**

**36.**— (1) Any person who throws down, drops or otherwise deposits or causes to deposit any litter in or on any public place contrary to the provisions of this Act, commits an offence and is liable to a fine of not more than five thousand dollars or imprisonment for not more than one month or a period of three months community service.

(2) A person who purposely aids, instigates or encourages another person to contravene any of the provisions of this section commits an

offence and is liable on summary conviction to a fine of five thousand dollars or in default of payment to imprisonment for one month.

(3) A person who, having been convicted of an offence under this section, is again convicted of an offence under this section, shall, on each subsequent conviction, be liable on summary conviction to a fine of ten thousand dollars or in default of payment to imprisonment for two months.

(4)(a) Without prejudice to any proceedings for an offence committed under any other enactment, where litter is left or caused to be kept in or on any premises, an authorized officer may give notice in writing to the person so leaving or causing any litter to be so left or to the owner or occupier of such premises requiring him or her—

- (i) forthwith, in the case of dead animals, carrion or other litter considered to be dangerous or offensive to health;
- (ii) within such time as may be stipulated in the notice not being less than three days,

to remove the litter so as to restore the premises to a satisfactory condition.

- (b) A notice under this section may be served on a person either personally or may be sent by post to his or her last known business or private address or may be posted up in some conspicuous place on the premises on which the litter has been left.
- (c) A notice sent by post shall be deemed to have been served, in the case of persons resident in Saint Lucia not later than the fifth day succeeding the day it was posted, and in the case of persons not so resident, not later than the fifteenth day succeeding the day on which the notice was posted and in proving such service it shall be sufficient to prove that the letter containing the notice was properly addressed and posted.
- (d) A person who fails to comply with the requirements of a notice under subsection (1), commits an offence and is liable on summary conviction to a fine of five thousand dollars and to a further fine of five thousand dollars for every day during which the offence is continued after conviction.
- (e) The authorised officer may enter the premises and remove the litter so left or caused to be left and may recover summarily as a civil debt the expenses reasonably incurred in so doing from the person who has failed to comply with the notice.

**Waste storage at public events**

**37.**— (1) Any person who holds any gathering, meeting or an event open to the public shall —

(a) prior to the gathering, meeting or event, submit a waste management plan to the Authority for review and approval; and

(b) supply sufficient litter bins for the gathering, meeting or event, and shall ensure that all litter on the site is properly collected and disposed at an approved landfill site within twenty-four hours of the gathering, meeting or event.

(2) An organiser who fails to comply with the provisions of subsection (1), commits an offence and is liable on summary conviction to a fine of not more than fifteen thousand dollars plus the cost of clearing up after the gathering, meeting or event reasonably incurred by the Authority or any other party who cleans up.

(3) In addition to the penalty under subsection (2) an organiser shall be liable to not more than three months of community service as the court may order.

**Derelict motor vehicles, white goods and other scrap metal**

**38.**— (1) The owner of a derelict vehicle, white goods or any other type of scrap metal, shall take the derelict vehicle, white good or other type of scrap metal to an approved landfill site or other site approved for the management of derelict vehicles, white goods or any other type of scrap metal.

(2) Where an authorized officer is reasonably of the view that —

(a) the location of a derelict vehicle, white good or other type of scrap metal or white goods detracts from the quality of the amenities enjoyed by any other person not being the owner of the vehicle; or

(b) the derelict vehicle, white goods or other type of scrap metal in its location constitutes a nuisance or is a hazard to human health or the environment,

the authorized officer shall, after due notice, order the owner of the derelict vehicle to remove it.

(3) For purposes of this section, notice shall be served on an owner of a derelict vehicle, white goods or any other type of scrap metal by affixing the notice of removal to the derelict vehicle, white goods or any other type of scrap metal in a conspicuous place.

(4) The owner of a derelict vehicle, white goods or any other type of scrap metal shall remove the derelict vehicle, white goods or any other type of scrap metal within seven days of the notice or, in the event of failure to so remove, the authorized officer shall cause the derelict vehicle, white goods or any other type of scrap metal to be removed and the owner shall be liable for any costs, reasonably incurred in connection with the removal.

(5) No liability shall attach to an authorized officer for the performance of his or her duties under this section.

(6) The owner of the derelict vehicle, white goods and other type of scrap metal, who fails to comply with a notice under subsection (3), commits an offence and is liable on summary conviction to a fine of five thousand dollars and to a further fine of five hundred dollars for every day during which the offence is continued after conviction.

(7) An authorised officer may at any time without giving any notice remove the derelict vehicle, white goods or any other type of scrap metal left or caused to be left and may recover from the owner thereof the expenses reasonably incurred in connection with such removal.

(8) The expenses determined under subsection (4) and (7) shall be deemed a judgement debt in favour of the Accountant General and shall be payable to the Accountant General together with interest at six percent per annum computing from the date of the removal.

(9) Where an authorized officer directs the removal of any derelict vehicle, white goods or other type of scrap metal from any private property or public place in pursuance of the foregoing provisions of this section, no action or other cause shall lie against him or her unless it is shown that such removal was in bad faith.

(10) For purposes of this section, an authorised officer may conclude that a vehicle is a derelict vehicle from —

- (a) the fact that any part of the vehicle including the wheel, the engine or seats have been removed;

- (b) any other factor taken together with the fact that the vehicle is not currently licensed, or has not been licensed in the last six months prior to a notice under this Act.

**PART VI**  
FISCAL AND OTHER INCENTIVES

**Incentives**

**39.** The Minister responsible for Finance may make Regulations to provide for the establishment of fiscal incentives and other inducements required to implement the National Waste Management Strategy and the provisions of this Act.

**PART VII**  
MONITORING AND ENFORCEMENT

**Monitoring and audits**

**40.**— (1) Any authority charged with monitoring any aspect of compliance with the conditions of a License under this Act may enter into an agreement with the holder of the License, to allow a third party, considered by the authority to be suitably qualified, experienced and independent, to monitor such compliance on behalf of both the holder of the License and the authority.

(2) In cases of inspections by a third party pursuant to subsection (1), the third party shall submit all reports simultaneously to both the holder of the License and the authority.

(3) Any authority charged with monitoring any aspect of compliance with a License under this Act may engage by contract any person, considered by the authority to be suitably qualified, experienced and independent, to monitor any aspect of the compliance by the holder of the License.

**Authorised officers**

**41.**— (1) The Minister in consultation with the other agencies may designate public officers and officers of government agencies as authorised officers for the purposes of this Act.

(2) A public authority may, subject to approval by the Minister, appoint in writing as it thinks fit such number of persons as may appear to it to be necessary or expedient as authorized officers for purposes of this Act.

(3) Authorized officers may be appointed for such period as may be determined by the Minister.

(4) A public authority shall pay any authorised officers appointed by it such remuneration whether by way of salary, fees, travelling or other allowance as the public authority may determine.

(5) The Minister shall supply to each authorized officer an identity card bearing the name and photograph of the holder and, the identity card shall be sufficient proof of the appointment.

(6) An authorized officer shall on the termination of his or her appointment, whether by removal from office or by resignation, surrender to the Minister his or her identification card and any uniform or badge of office that may have been issued to him or her.

(7) The Minister shall cause to be published in the *Gazette* the names of all authorized officers designated or appointed under this Act;

(8) In addition to officers of the Saint Lucia Solid Waste Management Authority, the following persons shall, by virtue of their office, be deemed to be authorized officers for the purposes of this Act —

- (a) a member of the Royal Saint Lucia Police Force;
- (b) a special reserve police, special constable and rural constable appointed under the Police Ordinance No. 30 of 1965 or any enactment replacing it;
- (c) an environmental Health Officer and Public Health Inspector appointed for purposes of the Public Health Act No. 8 of 1975 or any enactment replacing it and every person authorized by the Minister under the said Act;
- (d) a Forest Officer appointed for the purposes of the Forest, Soil and Water Conservation Ordinance (Cap 25) or any enactment replacing it.

**Powers and duties of authorized officers**

**42.** An authorised officer shall have the power to —

- (a) enter and inspect any waste management facility to verify compliance with this Act;

- (b) enforce the provisions of this Act;
- (c) prevent and detect offences under this Act;
- (d) arrest without a warrant any person who within view of such authorized officer commits any offence under this Act;
- (e) arrest without a warrant any person whom he or she has reasonable cause to suspect of having committed or being about to commit any offence under this Act;
- (f) generally take such action as is reasonable and lawful for securing compliance with this Act.

(2) An authorized officer may, in order to verify possession of and compliance with any condition of a Waste Haulage License stop and inspect any vehicle reasonably believed to be transporting waste.

(3) An authorised officer may inspect any aeroplane or ship to —

- (a) verify whether the aeroplane or ship has waste on board; and
- (b) take the measures necessary to ensure that any waste on board is not off-loaded contrary to the requirements of this Act or any other law.

(4) An authorised officer, other than a police officer in uniform, shall produce his or her identity cards on demand before conducting any inspection under this section.

(5) Any person who —

- (a) wilfully obstructs an authorized officer in the execution of his duties under this Act;
- (b) impersonates or falsely pretends to be an authorized officer;
- (c) unlawfully assaults an authorized officer;
- (d) makes use of any abusive, insulting, obscene, threatening or profane language to any authorized officer;
- (e) wilfully, and unlawfully removes, destroys or damages any receptacle used for the purposes of this Act;

commits an offence and is liable on summary conviction to a fine of ten thousand dollars or to imprisonment for six months or to both.

**Due diligence defence**

**43.**— (1) The Planning Authority may by Order list any published compilation of waste management standards as a recognised compilation of standards for the purpose of measuring the standard of due diligence under this Act.

(2) In the event of failure by a holder of a Waste Management License to comply with the conditions of the License, it shall suffice for the purposes of establishing due diligence, for the holder to show compliance with a compilation of standards under this section.

**PART VIII**  
MISCELLANEOUS

**Offences**

**44.**— (1) Any person who commits an offence under this Act or any Regulations made under it, for which no penalty is specified, shall be liable on the first conviction, to a fine not exceeding seventy-five thousand dollars or imprisonment for not more than one year, and for a second or a subsequent conviction to a fine not exceeding one hundred and fifty thousand dollars or imprisonment for not more than two years.

(2) Any offence under this Act, including an offence under any Regulations made under it, which is a continuing offence may be charged as a separate offence for each day for which the offence continues.

**Power to institute proceedings**

**45.** The Planning Authority, a member of the police force, the Minister, the Authority or any other person authorised in writing by the Minister may, institute proceedings in a court in respect of any offence under this Act.

**No statutory authorization of nuisance**

**46.** A License granted under this Act does not authorise the commission of any nuisance.

**Amendment of Schedules**

**47.** The Minister may by Order in the *Gazette* amend the Schedules.



**Register of Licenses and permits**

**48.**— (1) The Planning Authority shall maintain a register of all Licenses granted under this Act.

(2) The register shall be available for public inspection on the payment of such reasonable fee as may be prescribed by the Planning Authority.

**Act binds the Crown**

**49.** This Act binds the Crown.

**Repeal**

**50.** The following Acts are repealed —

- (a) The Litter Act No. 24 of 1983 is hereby repealed.
- (b) The Saint Lucia Waste Management Act No. 20 of 1996 is hereby repealed.

**Regulations**

**51.**— (1) The Planning Authority in consultation with the Minister may make regulations for —

- (a) the development and updating of the National Waste Management Strategy;
- (b) implementing any waste diversion and waste reduction policy as set out in the National Waste Management Strategy;
- (c) regarding waste management operations;
- (d) establishing the licensing system for the regulation of waste management facilities or equipment and waste haulage;
- (e) the conduct of environmental impact assessments for waste management facilities;
- (f) the enforcement mechanisms for prohibitions against dumping and littering;
- (g) establishing standards and requirements for waste handling, separation and processing;
- (h) regulating or restricting the import of used, second-hand, refurbished or reconditioned materials or goods;

- (i) prescribing fees for the issue of licenses, inspections and other services related to waste management provided pursuant to the provisions of this Act;
- (j) the training of human resources for the purposes of this Act;
- (k) the conduct of public education in waste management and the production of secondary resources.

(2) The Minister in consultation with the Planning Authority may make regulations for the —

- (a) collection, transportation, treatment, recycling and disposal of waste;
- (b) management of sanitary landfills;
- (c) collection and treatment of hazardous waste;
- (d) collection and disposal of derelict vehicles; and
- (e) reduction, re-use and recycling of solid waste.

(3) The Planning Authority may, in consultation with the Minister make regulations generally to give effect to the provisions of this Act and for the better performance of the duties of the Authority under this Act.

#### **Transitional**

**52.** Notwithstanding the repeal under section 51, all functions performed by the Saint Lucia Waste Management Authority under the repealed Acts shall, on the commencement of this Act continue to be performed by the Saint Lucia Solid Waste Management Authority under this Act.

**Schedule 1**

(Section 2)

**Wastes Classified as Hazardous Wastes****ANNEX 1***Waste Streams*

- Y1 Clinical wastes from medical care in hospitals, medical centres and clinics
- Y2 Wastes from the production and preparation of pharmaceutical products
- Y3 Waste pharmaceuticals, drugs and medicines
- Y4 Wastes from the production, formulation and use of biocides and phyto-pharmaceuticals
- Y5 Wastes from the manufacture, formulation and use of wood preserving chemicals
- Y6 Wastes from the production, formulation and use of organic solvents
- Y7 Wastes from heat treatment and tempering operations containing cyanides
- Y8 Waste mineral oils unfit for their originally intended use
- Y9 Waste oils/water, hydrocarbons/water mixtures, emulsions
- Y10 Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)
- Y11 Waste tarry residues arising from refining, distillation and any pyrolytic treatment
- Y12 Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish
- Y13 Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives
- Y14 Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known
- Y15 Wastes of an explosive nature not subject to other legislation
- Y16 Wastes from production, formulation and use of photographic chemicals and processing materials
- Y17 Wastes resulting from surface treatment of metals and plastics
- Y18 Residues arising from industrial waste disposal operations
- Y19 Wastes, from banned or expired agro-chemicals

*Wastes Having as Constituents:*

- Y20 Metal carbonyls
- Y21 Beryllium; beryllium compounds
- Y22 Hexavalent chromium compounds
- Y23 Copper compounds
- Y24 Zinc compounds
- Y25 Arsenic; arsenic compounds
- Y26 Selenium; selenium compounds
- Y27 Cadmium; cadmium compounds
- Y28 Antimony; antimony compounds
- Y29 Tellurium; tellurium compounds
- Y30 Mercury; mercury compounds
- Y31 Thallium; thallium compounds
- Y32 Lead; lead compounds
- Y33 Inorganic fluorine compounds excluding calcium fluoride
- Y34 Inorganic cyanides
- Y35 Acidic solutions or acids in solid form
- Y36 Basic solutions or bases in solid form
- Y37 Asbestos (dust and fibres)
- Y38 Organic phosphorous compounds
- Y39 Organic cyanides
- Y40 Phenols; phenol compounds including chlorophenols
- Y41 Ethers
- Y42 Halogenated organic solvents
- Y43 Organic solvents excluding halogenated solvents
- Y44 Any congener of polychlorinated dibenzo-furan
- Y45 Any congener of polychlorinated dibenzo-p-dioxin
- Y46 Organohalogen compounds other than substances referred to in this Annex (e.g. Y39, Y41, Y42, Y43, Y44).
- Y47 Wastes collected from households
- Y48 Residues arising from the incineration of household wastes

*Other*

Radioactive Wastes

**ANNEXII****LIST OF HAZARDOUS CHARACTERISTICS****UN CLASSCODE CHARACTERISTICS****1 H1 Explosive**

An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or wastes) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such speed as to cause damage to the surroundings.

**3 H3 Flammable liquids**

The word “flammable” has the same meaning as “inflammable”. Flammable liquids are liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc., but not including substances or wastes otherwise classified on account of their dangerous characteristics) which give off a flammable vapour at temperatures of not more than 60.5 degrees C. closed cup test, or not more than 65.6 degree C. open-cup test. (Since the results of open-cut tests and of closed-cup tests are not strictly comparable and even individual results by the same test are often variable, regulations varying from the above figures to make allowance for such differences would be within the spirit of this definition).

**4.1 H4.1 Flammable solids**

Solids, or waste solids, other than those classed as explosives, which under conditions encountered in transport are readily combustible, or may cause or contribute to fire through friction.

**4.2 H4.2 Substances or wastes liable to spontaneous combustion**

Substances or wastes which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up on contact with air, and being then liable to catch fire.

**4.3 H4.3 Substances or wastes which, in contact with water, emit flammable gases**

Substances or wastes which by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

**5.1 H5.1 Oxidising**

Substances or wastes which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion of other materials.

**5.2 H5.2 Organic peroxides**

Organic substances or wastes which contain the bivalent-O-O-structure are thermally unstable substances which may undergo exothermic self-accelerating decomposition.

**6.1 H6.1 Poisonous (Acute)**

Substances or wastes liable either to cause death or serious injury or to harm human health if swallowed or inhaled or by skin contact.

**6.2 H6.2 Infectious substances**

Substances or wastes containing viable micro organisms or their toxins which are known or suspected to cause disease in animals or humans.

**7 H7 Radioactive Materials**

Substances or material which spontaneously emit a significant radiation and of which the specific activity is greater than 70kBq/kg (2nCi/g).

**8 H8 Corrosives**

Substances or wastes which, by chemical action, will cause severe damage when in contact with living tissue, or in the case of leakage, will materially damage, or even destroy, other goods or the means of transport; they may also cause other hazards.

**9 H10 Liberation of toxic gases in contact with air or water**

Substances or wastes which, by interaction with air or water, are liable to give off toxic gases in dangerous quantities.

**9 H11 Toxic (Delayed or chronic)**

Substances or wastes which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity.

**9 H12 Ecotoxic**

Substances or wastes which, if released, present or may present immediate or delayed adverse impacts to the environment by means of bio-accumulation and/or toxic effects upon biotic systems.

**9 H13**

Capable, by any means, after disposal, of yielding another material e.g. leachate, which possesses any of the characteristics listed above.

**SCHEDULE 2**

(Section 2)

**Scheduled Agencies**

1. Ministry of Health
2. Ministry of Agriculture
3. Department of Fisheries
4. Division of Maritime Administration

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**SCHEDULE 3**

(Section 3)

**PART 1****Saint Lucia Solid Waste Management Authority**

1. In this Schedule —
  - “Authority” means the Saint Lucia Solid Waste Management Authority established under section 3;
  - “Board” means the Board of the Authority established under paragraph 6;
  - “Castries Corporation” means the Castries Corporation established by the Castries Corporation Act, No. 22 of 1967;
  - “Financial year” means such period of twelve months as the Authority with the approval of the Minister of Finance, determines to be its financial year; but the first financial year of the Authority shall commence after this Act comes into force and shall end on such day as shall be determined by the Authority;
  - “General Manager” means General Manager of the Authority appointed under paragraph 12, and includes any person for the time being performing the functions of the General Manager;
  - “member” means a member of the Board and “members” shall be construed accordingly;
  - “Minister” unless otherwise stated, means the Minister responsible for Physical Development, Environment and Housing;
2. The Authority established under section 3 of the Act shall be a body corporate to which, subject to this Act, section 19 of the *Interpretation Act*, No. 18 of 1968 applies.

3. (1) The Authority shall for the purposes of the Act, provide coordinated and integrated systems for the collection, treatment, recycling and disposal of solid waste, including hazardous waste, and establish and manage sanitary landfills throughout Saint Lucia, as appropriate.
- (2) Without prejudice to the generality of subparagraph (1), the Authority shall –
  - (a) manage, regulate, control and treat waste either alone or in conjunction with private companies or organizations;
  - (b) establish, maintain, improve and regulate the use of sanitary landfills and facilities, in accordance with established scientific principles and practices;
  - (c) establish and manage facilities for the collection and treatment of waste including hazardous waste;
  - (d) establish and maintain transfer stations;
  - (e) establish and promote a resource recovery system;
  - (f) oversee scheduling, safety and maintenance issues associated with solid waste management;
  - (g) promote and oversee public education related to solid waste management in collaboration with the relevant Ministries;
  - (h) develop a network to receive, monitor and respond to public complaints.
- (3) Subject to subparagraphs (1) and(2) the Authority shall perform such other duties as the Minister may direct from time to time or as contained in any other enactment.
4. (1) The Minister may, after consultation with the Board, give to the Authority directions of a general character as to the policy to be followed in the performance of its duties in relation to matters appearing to the Minister to concern the public interest.
- (2) The Authority shall furnish the Minister with such returns, accounts and other information as he or she may require with respect to the property and activities of the Authority, and shall afford him or her facilities for verifying such information in such manner and at such times as he or she may require



- 1.(1) The Authority shall be administered by a Board which shall be constituted as follows —
    - (a) the Permanent Secretary, Ministry of Physical Development, Environment and Housing who shall be the Chairperson;
    - (b) the Permanent Secretary of the Ministry of Health shall be the Deputy Chairperson;
    - (c) the Director of Finance or his or her nominee;
    - (d) the Permanent Secretary, Ministry of Social Transformation;
    - (e) the Attorney General or his or her nominee;
    - (f) a representative of the Saint Lucia Chamber of Commerce;
    - (g) a representative of the Association of Professional Engineers;
    - (h) a representative of the Saint Lucia Hotel and Tourism Association; and
    - (i) three persons appointed by the Minister who in his or her opinion represent any interests connected with or related to, the collection, disposal or recycling of waste.
  - (2) The persons appointed by the Minister shall hold office for a period not exceeding three years and shall be eligible for re-appointment.
  - (3) A member of the Board who cannot attend a meeting of the Board on account of illness or other illness or other temporary cause or who will be temporarily absent from the state shall inform the Chairperson.
  - (4) A member appointed by the Minister who absents himself without the leave of the Chairperson from three consecutive meetings of the Board shall cease to be a member.
  - (5) Where a member is absent on account of illness or other temporary cause or who is temporarily absent from the State, the Minister may appoint another person to be a temporary member for the period such illness or absence continues.
  - (6) The Board may regulate its own procedure.
- 6.(1) The Chairperson or in his or her absence, the Deputy Chairperson shall preside at meetings of the Board.
  - (2) The Board shall meet at such times as may be necessary or expedient for the transaction of business, and such meetings shall be held at such place and times as the Board determines.

- (3) At any meeting of the Board, six members shall form a quorum, but where any member is disqualified from taking part in any deliberation or decision of the Board with respect to any matter, he or she shall be disregarded for the purpose of constituting a quorum for deliberation on or deciding that matter.
  - (4) Subject to subparagraph (5), the Chairperson may at any time call a special meeting of the Board and shall however call a special meeting of the Board within seven days of a requisition for that purpose addressed to him or her by any three members to consider the matters pertaining to such requisition.
  - (5) The Chairperson shall call a special meeting of the Board if directed to do so by the Minister.
  - (6) A decision of the Board with regard to any question shall be determined by a majority vote of all the members present at the meeting of the Board, and in any case where the votes of the members present in regard to any question are equally divided, the Chairperson presiding at the meeting shall have a casting vote in addition to his or her own vote.
  - (7) The Board may co-opt any one or more persons to attend any particular meeting of the Board for the purpose of assisting or advising the Board, but no such co-opted person shall have any right to vote.
  - (8) Minutes of the proceedings of each meeting of the Board shall be kept in such manner as the Board determines and must be confirmed by the Chairperson as soon as practicable thereafter at a subsequent meeting.
7. (1) The Chairperson shall designate an employee of the Board to be the Secretary to the Board.
  - (2) The Secretary shall perform such duties, in relation to meetings of the Board, as the Chairperson determines.
8. (1) The Board may appoint committees of the Board to examine and report to it on any matter arising out of or connected with any of its duties under this Act.
  - (2) Any such committee shall consist of at least one member of the Board together with such other persons, whether members of the Board or not, whose assistance or service the Board requires.
  - (3) The Board may, by resolution, reject or adopt a report of a committee —
    - (a) either in whole or in part; or

- (b) with such modifications, additions or adaptations as the Board considers appropriate.
9. No personal liability shall attach to any member of the Board with respect to anything done or caused to be done in good faith under this Act and any damages, compensation or costs, that are ordered to be paid by court of a competent jurisdiction by any such member shall be paid out of the funds of the Authority.
1. (1) The Board shall, with the approval of the Minister, appoint a suitably qualified person to be the General Manager of the Authority on such terms and conditions as the Board determines.
- (2) The General Manager shall exercise all such powers and duties that are vested in him or her by this Act and regulations made thereunder and shall be present at all meetings of the Board unless he or she is instructed by the Chairperson to withdraw from any meeting or he she has obtained leave of absence from the Chairperson or is incapacitated by illness or other cause from attending any meeting.
- (3) Where the General Manager is absent from office due to illness or otherwise, the Board may, with the approval of the Minister, appoint a suitably qualified person to act as General Manager on such terms and conditions as the Board determines.
11. (1) The Authority shall have such officers and staff as are appointed by the Board on such terms and condition as it determines and as it deems necessary for the proper carrying out of the functions of the Authority.
- (2) The persons appointed under subsection (1) shall perform such duties as may be assigned to them by the General Manager.
12. (1) Subject to the National Insurance Corporation Act No. 18 of 2000 or any enactment replacing it, the Authority may with the approval of, and subject to general policy directions by the Minister provide for the establishment and maintenance of a pension scheme for the benefit of its officers and staff.
- (2) Without prejudice to the generality of subparagraph (1), the pension scheme may empower the Authority to –
- (a) grant gratuities, pensions or superannuation allowances to the widows, families or dependents or its officers and staff;
  - (b) establish contributory and superannuation funds for the benefit of its officers and staff; and

- (c) enter into and carry into effect agreements with any general insurance company or other institution for the purpose of effecting the pension scheme.
13. (1) The funds of the Authority shall consist of —
- (a) sums vested in or granted to, the Authority by the Government or international body or governmental agency;
  - (b) sums collected by the Authority in respect of the levy and fees imposed by this Act.
  - (c) sums borrowed by the Authority;
  - (d) sums, becoming payable to or vested in the authority in respect of any matter that is incidental to its powers under this Act; and
  - (e) sums received by the Authority from any short-term investment of the funds of the Authority.
- (3) The funds of the Authority, in any financial year, shall be applied with respect to the payment of the following —
- (a) interest, principal and other charges in connection with the repayment of any loan obtained by the Authority;
  - (b) remuneration, fees and allowances payable under this Act;
  - (c) compensation, damages and fees ordered by a court of competent jurisdiction to be paid by any employee of the Authority; and
  - (d) salaries, remuneration, allowances, pensions, gratuities, provident fund and other superannuation benefits, of the officers and staff, employed in or in connection with the activities carried on by the Authority.
14. (1) The Authority may from time to time secure short term investment of its funds that are not required for the purposes of meeting its obligations or discharging its functions, under this Act.
- (2) The income derived from any investment under subparagraph (1) shall be paid to the credit of the Authority.
- (3) Any investment under this paragraph shall be subject to the approval of the Minister.
1. (1) The Authority may from time to time borrow money —
- (a) from the Government; or
  - (b) with the approval of the Minister, from any other source.

- (2) The power to borrow money under this paragraph may be exercised—
  - (a) by the creation of debentures or other security over the assets of the Authority;
  - (b) by the creation and issue of debentures;
  - (c) by way of re-financing;
  - (d) by conversion, whether by arrangement with the holders of the existing debentures or debenture stock or other security out of moneys raised by the sale of the debentures or debenture stock or other security or partly in one way or partly in another; or
  - (e) by the way of a guarantee provided by the Government.
- (3) The power to borrow under this paragraph shall not be exercised unless a written proposal is first submitted to and approved by the Minister showing –
  - (a) the amount and particulars of the proposed loan;
  - (b) the rate of interest payable on the loan;
  - (c) the source from which the loan is to be obtained;
  - (d) the purposes to which the loan is to be applied; and
  - (e) the manner in which the loan is to be repaid.
2. (1) The Minister, may, with the approval of Parliament, guarantee in such manner and on such conditions as he or she considers appropriate, the repayment of the principal, interest and other charges with respect to any authorized borrowing by the Authority.
- (2) Where the Minister is satisfied that there has been default in the repayment of any such principal, interest or other charges guaranteed under this paragraph, he or she shall give written directions that such payments be made out of the Consolidated Fund of the amount in respect of which there is a default.
- (3) Subject to subparagraph (4), the Authority shall make payments to the Accountant General, at such times and in such manner as the Minister may direct, of such amounts as may be so directed in or towards the repayment of any sums paid in fulfillment of any guarantee given under this paragraph, and payment of interest on what is outstanding for the time being in respect of any sums so issued at such rate as the Minister directs.
- (4) The Minister may for the purposes of subparagraph (3), direct that different rates of interest shall be payable with respect to different sums and for different periods.

- 17.(1) The Authority shall establish and maintain a Reserve Fund which shall be dealt with and applied as the Authority determines.
- (2) The Reserve Fund shall be derived from the surplus of the Authority and shall be such percentage thereof as the Minister directs in writing.
  1. Any balance remaining at the end of the financial year which results from the exercise of the powers and duties of the Authority shall, after the deduction of an amount for the purposes of paragraph 17, be paid into the Consolidated Fund.
19. (1) The Authority shall cause a budget to be prepared with respect to the ensuing financial year.
  - (2) The budget so prepared shall be submitted to the Board for approval.
  - (3) A copy of the budget approved by the Board shall be submitted to the Minister by the Board within seven days after such approval.
- 20.(1) The Authority shall keep proper books of account in which shall be recorded all its transactions to the satisfaction of the Board and shall prepare and retain financial statements in respect of each financial year.
  - (2) The financial statement shall represent the true and fair financial position of the Authority and of the results of the operations of the Authority.
- 21.(1) The Accounts of the Authority shall be audited in each financial year by an independent, qualified and experienced accountant or firm of accountants appointed by the Board.
  - (2) The Board, and the officers and staff of the Authority shall make available to the Accountant all books, ledgers, deeds, contracts, accounts, vouchers and other documents which are required for the purposes of subparagraph (1), and the accountant may require any person holding or accountable for any such document to appear before him or her and give a signed statement or information in relation to any such document.
22. The accountant shall as soon as practicable, but not later than three months after the end of each financial year, send copies of the audited financial statement and report thereon to the Authority.
23. (1) The Authority shall as soon as practicable but not later than one month after the receipt of the audited financial statement and report under paragraph 22, submit a separate report to the Minister containing –

- (a) the audited financial statement and the report thereon received from the accountant; and
  - (b) a review of the activities of the Authorities during the preceding financial year in such form as the Minister directs or approves.
- (2) The Minister shall cause a copy of the audited financial statement and report thereon together with the review to be laid in both Houses of Parliament within one month of the receipt thereof.
- (3) In this paragraph Minister means the Minister of Finance.
- (4)(1) An environmental levy is hereby imposed on all visitors at such rate as the Minister by order prescribes, with respect to each visit to Saint Lucia.
- (2) The environmental levy shall be collected by the Saint Lucia Air and Seaports Authority or by such agent of the Authority and paid over to the Authority at such time and in such manner as the Minister directs.
- (3) For the purpose of this section “visitor” means a person who arrives in Saint Lucia, whether by air or by sea, for the purpose of business or vacation and is so admitted to remain in Saint Lucia whether for a day, or part thereof, or longer.
- (4) The Minister shall cause a notice of the appointment of any person or entity, as an agent of the Authority, to be notified in the Gazette.
- (5)(1) Where the proceeds of the levy in respect of any month are collected under subparagraph (2), they shall be paid over by the Saint Lucia Air and Seaports Authority to the Authority on or before the twenty-first day of the month following which such proceeds were collected.
- (2) The Saint Lucia Air and Seaports Authority shall at the time of such paying over under subparagraph (1) submit to the Authority such records or other documentation concerning the collection of the levy for the period to which the proceeds of the levy relates.
- (6)(1) There shall be a fee to be known as a “haulage fee” which shall be paid by a person who requests the Authority to haul or transport solid waste to a sanitary landfill or elsewhere.
- (2) The haulage fee shall be charged on the basis of the weight of the solid waste at such rate as the Minister prescribes by Order.
- (3) The haulage fee payable under this section shall be paid to the Authority on or before the twenty-first day of the month following which the service was rendered; and any unpaid haulage fee that remains so unpaid for a period of thirty days from the due date becomes an unpaid debt to which section 31 applies.

- (7) (1) There shall be a fee to be known as a “tipping fee” which shall be paid by a person who requests that Authority to unload any container containing solid waste by mechanical means.
  - (2) The tipping fee shall be charged on the basis of the weight of the contents of the container that contains the solid waste and shall be at such rate as the Minister prescribes by order.
  - (3) The tipping fee payable under this section shall be paid to the Authority on or before the twenty-first day of the month following which the service was rendered by the Authority; and any tipping fee that remains unpaid for a period of thirty days from the due date becomes as unpaid debt to which section 31 applies.
24. (1) Service of any notice, order, or other document required or authorized under this Act or any regulation to be served on any person by the Authority may be effected by –
- (a) delivering it to that person;
  - (b) leaving it at the usual or last known place of abode of that person; or
  - (c) sending it by registered post addressed to the person at his or her usual or last known address.
- (2) Service of any notice, order, writ or other document required or authorized under this Act or any regulation to be served on the Authority may be effected by–
- (a) delivering it to the General Manager;
  - (b) sending it by registered post addressed to the General Manager at the office of the Authority.
- 25.(1) Where for a period of thirty days any debt, by way of levy, fees or otherwise, is owed to the Authority, such a debt may be certified in relation to that person by the General Manager or other officer of the Authority in a certificate, called an unpaid debt certificate in the form prescribed in the Schedule 3 Part II.
- (2) An unpaid debt certificate for the purposes of this paragraph shall be of no effect unless it is sworn to before the Registrar of the Supreme Court and bears the stamp or seal of that office duly affixed.
  - (3) An unpaid debt certificate shall be filed in triplicate, in the Land Registry or in the Registry of Deeds and Mortgages by the Authority and when so filed shall be deemed to be a judgement and shall take effect upon such registration in favour of the Authority against the person named in the certificate for the amount specified plus —



- (a) interest on such amount at the rate of five percent per annum or such other rate as may be prescribed for such purpose, whichever is the lesser; and
  - (b) reasonable costs and disbursements attendant upon the registration of the certificate.
- (4) Where an unpaid debt certificate is filed in accordance with this section, the person filing such certificate shall forthwith deliver a copy of the certificate, bearing the stamp of the Land Registry or the Registry of Deeds and Mortgages, as the case may be, in which it is filed, to the person named in the certificate; but if a copy of the certificate is not delivered within fourteen days of such filing, then subparagraph(2) shall cease to have effect with respect to the unpaid debt certificate.
- (5) Where an unpaid certificate has been satisfied, the General Manager or other officer of the Authority shall cause a certificate of payment in the form prescribed in Schedule 3 Part III, to be registered in the Land Registry or the Registry of Deeds and Mortgages; but such a certificate shall be of no effect unless it is sworn before the Registrar of the Supreme Court and bears the stamp or seal of that office.
- (6) A certificate of payment registered in accordance with subparagraph (4) shall have the effect of discharging a judgement under this section.
26. Notwithstanding anything contained in any enactment to the contrary, where a judgement exists by virtue of paragraph 5(1), against any person in respect of any levy or fees, the Authority may proceed to execute and enforce that judgement in accordance with the relevant rules of court.
- 27.(1) The Cabinet may by order vest any parcel of Crown Lands in the Authority in order to enable the Authority to give effect to its duties under this Act.
- (2) Any land vested in the Authority shall be free from incumbrances.
  - (3) An order under this paragraph shall be subject to an affirmative resolution of Parliament.

**Part II**

**UNPAID PREMIUM CERTIFICATE**

*Waste Management Act, 2003*

I, \_\_\_\_\_ of \_\_\_\_\_ holding the post of \_\_\_\_\_ at the Solid Waste Management Authority (*the Authority*) hereby certify that the sum of \_\_\_\_\_ is owed to the Authority with respect to \_\_\_\_\_ as set out in the attached Statement of Claim.

I further certify that the above-mentioned sum is owed to the Authority for a period of more than thirty days.

Sworn to at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 200

**BEFORE ME:** \_\_\_\_\_  
*Registrar of the Supreme Court*

**FILED** in the \_\_\_\_\_ Land Registry/Registry of Deeds and Mortgages  
this \_\_\_\_\_ day of \_\_\_\_\_, 200

\_\_\_\_\_  
*Registrar of Lands/Registrar  
of Deeds and Mortgages*

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**STATEMENT OF CLAIM**

**Part III**

**CERTIFICATE OF PAYMENT**

**Waste Management Act, 2003**

I, \_\_\_\_\_ of \_\_\_\_\_ holding the post of \_\_\_\_\_ at the Solid Waste Management Authority (*the Authority*) hereby certify that the unpaid Debt Certificate filed on \_\_\_\_\_ against \_\_\_\_\_ of \_\_\_\_\_ was fully discharged on the \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_.

Sworn to at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_

**BEFORE ME:** \_\_\_\_\_  
*Registrar of the Supreme Court*

**FILED** in the \_\_\_\_\_ Land Registry/Registry of Deeds and Mortgages  
this \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_

\_\_\_\_\_  
*Registrar of Lands/Registrar of Deeds and Mortgages*

**Schedule 4**

(Section 4)

**Solid Waste Management Facilities Vested in the Authority**

1. Deglos Landfill Site at Deglos in the quarter of Bexon
2. Aupicon Disposal site at Vieux Fort

**SCHEDULE 5**

(Section 20)

**List of Issues to be Covered in any Environmental Plan submitted with Application for Waste Management License**

Requirements for Conduct of Environmental Impact Assessments (EIAs) and Environmental Plans (EPs) in Support of A Waste Management Facility

This Annex identifies general procedures for undertaking environmental impact assessments (for new facilities) and environmental plans (for existing facilities) in support of waste management facility siting, construction and operation. In addition, it identifies environmental issues that should be specifically addressed with respect to the following types of solid non-hazardous waste management facility:

1. Landfills
2. Transfer stations
3. Composting facilities
4. Facilities for processing recyclable materials
5. Steam Sterilization (Autoclaving Facilities)
6. Incinerators and Thermal Treatment Facilities

The requirements identified in this Annex should be entered into regulation.

**General Procedures For Undertaking EIAs and Eps**

EIAs and EPs are intended to identify potential negative impacts associated with facilities and to identify measures for mitigating those impacts. The distinction between the two types of study is that EIAs are performed on proposed facilities; these studies should consider a wider range of options than EPs for mitigating potential negative impacts since these measures can be designed into the proposed facility. EPs consider the actual or potential negative impacts of existing facilities. Although the range of issues to be considered is similar to the range of issues to be considered in performing an EIA, the range of measures that are considered is more restricted since the facilities already exist and a variety of mitigating measures that might be feasible for a proposed facility (and therefore considered under an EIA) are not feasible for existing facilities and therefore cannot be considered under an EP.

EIAs and EPs are essential to defining the permit requirements for the siting, construction and operation of waste management facilities, and are therefore integral to the permitting system proposed under this policy. Consistent with national policy and/or legislation regarding planning and environment, the following procedure should be undertaken in execution of EIAs and EPs:

1. A description of the proposed or actual facility should be provided, noting the scale and hours of operation of the facility, transportation requirements into and from the facility, emissions (e.g. gaseous, liquid or solid waste, noise, odour, dust) from the facility, and potential of facility operations to impact health or the economy (e.g. through attraction of vermin, discharge of leachate or other liquids, introduction or release of new species etc).
2. A description of the environment in which the facility is or is proposed to be located should be provided. This should address the general topography of the location, surface/subsurface and marine water regimes, general atmospheric and wind conditions, fauna/flora and critical habitat (and particularly with respect to possible presence of threatened or endangered species), presence of archaeological or cultural resources, actual land use and potential for other land uses (not to be considered for EPs).
3. Possible or actual facility impacts should be determined associated with each of siting, construction and operation. Mitigation measures should be identified for negative impacts and the extent of residual negative impact should be determined. Impact analysis should consider both direct impacts (i.e. those impacts that the facility will have as a direct consequence of its location and operation) and indirect impacts (i.e. impacts that may be facilitated as a consequence of the siting or operation of a facility, but for which there may be other contributing factors). The financial, social and environmental implications of implementation of mitigation measures should be detailed.
4. EIAs in support of proposed new publicly-owned facilities should consider alternative general processes (e.g. implementation of waste diversion strategies instead of a waste disposal facility) to the proposed facility that would have lesser impacts or a lower cost than the proposed facility. Analysis of alternatives is not feasible for existing facilities simply because they already exist; nor is analysis of alternatives feasible for privately-owned proposed facilities because the private owner is engaged in a business in which they have specialist expertise and business opportunity and who do not therefore have choices open to them regarding alternatives to what they propose.
5. Public consultation should be undertaken as a required task of an EIA. Focus should be placed on explaining the purpose of the new waste management facility, the benefits of the proposed facility, potential negative impacts associated with the facility and measures that are proposed to mitigate negative impacts. The perspectives of stakeholders should be assessed and incorporated into the proposed new facility, as possible and desirable. Information may also be available from residents regarding the local environment that is not available from other sources,

and which may therefore contribute to analysis of impacts and mitigation measures.

6. EIAs should conclude with recommendations regarding: (i) whether there are preferred alternatives to the proposed facility; (ii) the social and environmental suitability of the site on which the proposed facility is proposed to be located; (iii) the mitigation measures that should be incorporated in the design, construction and operation of the facility in order to mitigate potential negative impacts; (iv) the costs associated with application of the proposed facility. EPs should address items (iii) and (iv) of these points; and those elements of point (iii) that are relevant to the facility in question.

New facilities should be allowed to proceed only if: (i) a preferred alternative is not identified; and (ii) the proposed location is environmentally and socially suitable, or can be made so in a fashion consistent with the sustainability of environmental and social systems. The mitigation measures associated with proposed new or existing facilities should become conditions on the permits issued to the facilities, and should be enforced.

#### **Direct Facility-Specific Environmental Impacts**

Table C-1 identifies environmental issues specific to different types of waste management facility. Cells identified with a “**X**” represent issues that should generally be addressed in detail in any EIA or EP for the type of facility in question; these issues typically have serious negative impacts in all cases unless mitigation measures are sufficiently developed. Cells identified with a “x” represent issues that are typically less significant for the facility in question; however, site specific factors may result in these issues being as potentially serious as those indicated with a “**X**”. Open cells identify that the issue is not typically associated with the facility.

The issues identified in Table C-1 are briefly annotated below:

- Habitat removal
- Source reduction
- 
- Education

**Table C-1****Direct Impacts Typically Addressed In Environmental And Social Impact Assessments Of Waste Management Facilities**

	Impacts of Natural Disaster	Cultural/Archaeological Resources	Flora/Fauna	Land Use (Existing or Proposed)	Critical Habitat	Expropriation/Resettlement	Social Fabric	Air Emissions
<b>Landfill</b>	X	X	X	X	X	X	X	X
<b>Autoclave</b>	X	x	x	x	x	x	X	
<b>Centralized Composting</b>	X	x	x	X	x	x	X	X
<b>Recycling Facilities</b>	x	x	x	x	x	x	x	x
<b>Transfer Stations</b>	X	x	x	x	x	x	X	x

	Surface Water	Ground Water	Marine Waters	Access Road	Dust/Litter	Noise	Traffic	Vector Vermin	Species Introduction	Process Residues
<b>Landfill</b>	X	X	X	X	X	X	X	X	X	X
<b>Autoclave</b>	x	x	x	x	x	X	X	X	x	X
<b>Centralized Composting</b>	X	X	X	X	X	X	X	X	X	X
<b>Recycling Facilities</b>	x		X	x	X	X	X	X		X
<b>Transfer Stations</b>	x		X	x	X	X	X	X		x

**NOTE:** The symbol “X” indicates that this issue is to be addressed in environmental impact assessments of the waste management facilities identified. The symbol “x” indicates that it may be appropriate to address this issue in environmental impact assessments of the facility identified depending on the specific location and/or operations of the proposed facility. An empty cell indicates that it is not necessary to address that issue in an environmental impact assessment for the facility identified.



Landfill

Landfills require large areas relative to other waste management facilities and environmental and social issues in the siting of these facilities are all of high importance. Landfills preclude any other use of the land while the landfill is in operation, and may limit options on immediately adjacent land. Landfilling profoundly disturbs the land on which the landfill is located, and typically results in the loss of all surface and immediate sub-surface resources associated with the land. Operationally, landfills have potential to result in wide and serious environmental and social impacts.

Autoclave/Incinerators

Biomedical waste treatment facilities are proposed for several OECS countries. Incineration of solid, non-hazardous waste may also be undertaken but requires a constant supply of waste, high energy demands to sustain, incurs very high capital and operational costs when operated to modern environmental standards (even when energy recovery is undertaken), cannot treat all wastes and does not remove the need for subsequent landfilling; although these types of facility may play a role in future waste management systems in OECS countries, they are not proposed for implementation in the current project.

Incinerators are typically located in industrial or commercial zones for economic reasons, since these zones are generally those that are best equipped with the infra-structural requirements of an incinerator. The siting impacts of incinerators are therefore typically modest, although in any specific instance serious siting issues may emerge; these are often driven more by social issues than technical issues. Operationally, however, incinerators may have serious environmental and social consequences, particularly with respect to air emissions. Dioxins, furans and heavy metals are all emitted by incinerators and are subject to very stringent controls in industrialised countries because of their potential to impact human health and the environment. In areas of poor air circulation or which are prone to air inversions, overall air quality can be seriously impaired by incinerators, although this is not typically an issue with biomedical waste incinerators. Process residues (ash) require landfilling, wastes must be promptly incinerated to avoid attraction of vermin/vectors and measures should be taken to ensure adequate control of noise and traffic.

Centralized Composting

Centralized composting at the scale proposed in OECS countries has a small-to-intermediate land requirement and consequently does not tend to have the same level of siting impacts as a landfill. Operationally, centralized composting may have a wide range of negative impacts as landfilling, and the design and operation of centralized composting facilities should be carefully planned and undertaken to ensure that these impacts are eliminated or reduced to an acceptable level; although composting is environmentally advantageous, composting that is undertaken without due care to the issues identified in Table

C-1 can be environmentally damaging. Operational concerns associated with composting arise primarily from the degradation of organic materials, but “low-Tech” solutions exist for all the concerns identified.

#### Recycling Facilities

Recycling facilities are industrial operations that should be located in industrial or commercial zones if they are not located at a landfill site. Their siting and operational impacts are typically modest and are similar to other types of industrial or commercial operation.

#### Transfer Stations

Transfer stations involve the bulking of waste into larger quantities in order to reduce haulage costs over long distances. Small areas of land are required and their siting impacts are therefore modest. Issues associated with the operation of transfer stations revolve around the handling of waste, odours and litter that this may generate, and traffic management. For the most part, these issues impact on communities rather than on the environment.

#### **Indirect Impacts**

Indirect impacts associated with waste management facilities are facility-dependent, but might include some or all of the following, and other impacts: (i) urban or peri-urban growth; (ii) increased pressure on local natural areas; (iii) impacts on adjacent land values; and (iv) impacts on environmental receptors (e.g. coral) remote from the waste management facility (through transportation of contaminants away from the waste management facility). The indirect impacts associated with waste management facilities should be identified and mitigation measures should be undertaken to address these; often, appropriate mitigation measures involve policy or planning actions by government.

**Schedule 6**

(Sections 23)

**General Siting, Design and Operating Criteria for Waste Management Facilities and Haulage Systems**

This Annex presents general criteria that should be used in the siting, design and operation of the following waste management facilities: (i) landfills; (ii) composting facilities; (iii) facilities for processing recyclable materials; and (v) steam sterilization (autoclave) facilities.

Different types of waste management facilities have different types of design and operating criteria associated with them and criteria that are appropriate for one type of facility are often not relevant for another type of facility. In addition, criteria for some facilities may be site specific and although a design or operating parameter may be identified in this Annex the value that is associated with the parameter may depend on site specific circumstances. Where this is the case, the parameter is identified in this document and guidance is provided regarding how specific values should be developed for the parameter.

Although there is no single source of international standards for waste management facilities and operations, the standards presented in this Annex are consistent with international practice. In all cases, the standards identified in this Annex should be considered minimum standards, Countries may wish to adopt more stringent standards in accordance with their own priorities.

**LANDFILLS**

Of all waste management facilities, landfills are generally the most complex to site and also have stringent design and operating criteria associated with them. Community and social issues associated with landfills may be difficult to address to the satisfaction of all parties, and are often more difficult to resolve than engineering and other technical issues.

**Landfill Siting**

*Negative Impacts Associated With Landfill Site Locations.* The siting of landfills and associated infrastructure (e.g. access roads) may have the following negative impacts:

1. Use of land previously under some other use or with potential for some other use.
2. Destruction of natural habitat.
3. Impact on threatened or endangered species.

4. Encroachment on communities.
5. Requirement for purchase or expropriation of private property.
6. Resettlement of squatters.
7. Impact on archaeological or other heritage resources

It is frequently the case that it is not possible to identify a suitable land area required for a landfill or associated infrastructure without incurring one or more of these impacts. Landfill siting criteria should therefore be established at the outset of a landfill siting initiative that set out:

1. Whether there are any areas that will not be considered for a landfill even though they may be socially, geologically and financially suitable. Such areas might include: (i) those in which threatened or endangered species live; (ii) habitat essential to the survival of threatened or endangered species; or (iii) areas in which irreplaceable archaeological or cultural resources are located. Generally, international financial institutions and donor countries will not provide financing to landfills that negatively impact threatened or endangered species. Landfills requiring forced resettlement may also not be eligible for financing from such institutions or countries.
2. The relative importance of geologic, economic, environmental, social and other factors in determining where new landfill and associated infrastructure should be located. Proven engineering solutions usually exist to mitigate all negative impacts that would otherwise be associated with a new landfill, except for those associated with habitat or species loss or loss of archaeological or cultural resources. In this sense, resolving landfill siting issues can be seen as an economic issue and the relative importance assigned to landfill siting factors may reflect the costs of mitigating negative impacts associated with siting a landfill in a location that is less than ideal.

Landfill Siting Criteria. The following landfill siting criteria are recommended for adoption:

The siting of a landfill in the following locations will be prohibited:

1. Areas that impact threatened or endangered flora or fauna.
2. Areas that disturb habitat on which such flora or fauna are dependent.
3. National parks or other areas reserved to preserve or conserve natural, cultural or archaeological heritage.

To the extent possible, landfills and associated infrastructure will be located in areas that meet the following criteria:

1. Soils underlying the landfill will have a minimum depth of 3 feet and a uniform water permeability of  $10^{-6}$  cm/second or less.

2. Topography will minimize the extent of civil works necessary to prepare the landfill.
3. Land on which the landfill will be located will have been previously used for waste disposal.
4. The landfill will be located in proximity to the centre of waste generation within the region served by the landfill in order to minimize the costs of waste haulage.
5. Landfills will be adjacent to a road suitable for heavy vehicle use in all seasons.
6. Landfills will be in rain shadows or other areas of low rainfall.
7. Landfills will be in an areas where the prevailing winds are of low velocity and blow offshore.
8. Areas not susceptible to wind or water damage as a result of a hurricane or storm will be favoured for landfill location.
9. Areas not traversed by rivers and streams, or in the 100 year flood plain of a river or stream will be favoured for landfill location.
10. Areas not underlain by an aquifer, and particularly one that is used for drinking water or watering of livestock, will be avoided in siting landfills.
11. Landfills will be located in areas that offer a spatial buffer of at least 100 metres from any community, national park or other area reserved to preserve or conserve natural, cultural or archaeological heritage.
12. The nearest point of the fill area will not be closer than 50 yards to a home or hospital;
13. Landfills will be located in areas that do not impinge unreasonably on existing or planned economic activities, such as on land used for agriculture or on or adjacent to land with potential for tourism development.
14. Areas that require the forced resettlement of individuals will not be favoured for landfill.

As indicated above, it is likely that the siting of a landfill will not be possible without contravening one or more of these siting criteria. The criteria should therefore be weighted according to both the significance of government policies affecting each (to the extent that such policies exist) and according to the economic cost of mitigating the negative impacts of criteria that are insufficiently addressed. This process will tend to discourage the siting of a landfill in a location that results in impingement on government policy and in locations that will incur unreasonably high costs to mitigate the natural and social insufficiencies of the location. Public input into this process of weighting siting criteria may be useful and may result in increased public buy-in to the siting process. Potential landfill locations can then be evaluated against the weighted siting parameters and the preferred location can be identified.

**Design Standards**

Following the siting of a landfill, design standards are necessary to minimise the impact of a landfill on the adjacent environment. Design standards that are adopted in any particular instance will be a function of the extent to which a landfill site satisfies the siting criteria set out above and the sensitivity of environmental and community receptors to negative impacts caused by a landfill. The following design philosophies and standards should be adopted as minimum requirements associated with landfill design.

*General Considerations.* All landfill facilities and components should be designed to minimize negative impacts on the environment and communities during construction. Zones of land disturbance should not extend beyond the area occupied by the landfill and associated buffer, and should not extend beyond the ditches that may be constructed to either side of the access road.

*Specific Considerations.* The following specific design standards and design philosophies should be established:

1. *Storm water control.* Storm water control refers to the management of surface water flowing into or over a landfill site. Storm water entering a landfill can disrupt landfilling operations, flood the landfill, carry detritus from the landfill and increase leachate quantities. Landfill designs should ensure that drainage works are incorporated into landfill design to: (i) intercept any watercourses (permanent or seasonal) that cross the landfill site; and (ii) catch and divert surface water that may enter the landfill during or following a precipitation event whether or not such water is in a “watercourse”. Drainage works should be sized to ensure that surface water will not enter the landfill even under the most extreme conditions under which the landfill will operate, which may be defined to equate to a once in 25 years storm. Drainage works carrying storm water from a landfill site should discharge to a watercourse or the marine environment. If this is not feasible, storm water should be discharged into the natural environment in such a way that the velocity and quantity of water so discharged does not result in erosion of the land onto which the discharge takes place. A storm water retention pond should typically be included in the stormwater management system to regulate the rate of discharge of stormwater to the receiving environment, and to allow the settling of sediments carried by stormwater.
2. *Leachate collection.* Leachate is the term used to describe the liquid generated by landfill sites. Leachate generation is a function of two factors: (i) the decomposition of waste in the landfill, and (ii) precipitation draining through the landfill. Leachate typically is characterised by elevated levels of a variety of environmental contaminants, particularly those creating high biological oxygen demand (BOD) levels and levels of heavy metals, that may cause extensive impairment of water quality and populations of natural organisms. The negative effect of landfill leachate may be mitigated

by natural soil processes and dilution. The probable impact of leachate on the environment may be modelled to determine the likely impact of leachate on receptors. The reliability of such modelling has often not been high; however, when data inputs are based on assumptions for want of reliable, time-series data. As a consequence, jurisdictions in North America and Europe are increasingly adopting specific leachate quality criteria and regulatory design criteria.

In order to protect against the uncontrolled release of leachate, the permeability of the landfill base should be no greater than  $10^{-6}$  centimetres/second throughout the top 3 feet of the ground immediately beneath the base of the engineered fill if there are receptors down gradient from the landfill that are sensitive to high BOD levels or any of the parameters recommended to be monitored, see below. There should be no cracks or porous zones within this depth. Achievement of this standard may require the placement of natural or artificial materials. Alternatively, a synthetic landfill liner may be installed to prevent the escape of leachate. Such a liner should have flexibility to absorb the pressures of landfilling that will be undertaken in the landfill and should be installed according to engineering specifications recommended by the supplier and verified by a qualified engineer.

The base of all cells in a landfill should be designed with a minimum 3 percent slope. Leachate collection pipes or drains should be installed at the downhill end of the slope and should be designed to carry leachate to a retention pond. Subject to site specific recommendations of a design consultant, the leachate retention pond should be sized to accommodate leachate generation associated with the wettest one month period in 25 years and should preferably be located at the lowest point of the landfill site.

3. *Leachate treatment.* The extent of appropriate leachate treatment is a function of the sensitivity of receptors to leachate. "Conventional" leachate treatment employs similar processes to sewage treatment. However, this may be unaffordable. Alternatives include: (i) re-circulation of landfill leachate onto the covered surface of the landfill - this may result in development of a salt hardpan on the soil surface, necessitating periodic scarifying of soils; (ii) creation of artificial wetlands to treat landfill leachate, an approach that may be highly effective in OECS countries; and (iii) extended aeration and mixing.
4. *Landfill gas collection.* Landfill gas is a collective description of the gases produced by decomposition processes in a landfill; these gases include methane (an explosive gas), odorous gases and gases that are toxic to vegetation if they reach the roots of the vegetation. In the absence of an ability to vent to the atmosphere, landfill gases may migrate from the

area of the landfill into adjacent soils, where they may kill vegetation or vent through buildings, causing unpleasantness and/or risk of explosion. To counter this problem, landfill designs should include the installation of gas vents that allow landfill gas to escape to the atmosphere. The effective number and configuration of the vents will be a function of the landfill site and filling sequence.

5. *Erosion control.* All interim and final contours should be required to be seeded or planted with dense, but shallow, rooted species to hold soils in place without disturbing buried waste. Final slopes should not normally be steeper than 3:1.
6. *Noise control.* Noise associated with landfill operations may be minimised by a physical barrier between the landfill and adjacent lands at similar elevation. If no natural barrier is present, a berm of up to 3 metres in height may be effective.
7. *Litter control.* The escape of litter from a landfill site can be prevented through erection of a 1.8 metre (minimum) high perimeter fence, combined with effective operational controls (see below).
8. *Site security.* In some instances, the physical features associated with the location of a landfill may result in high levels of site security; for example, a landfill located in a quarry in which rock faces effectively prevent entry by unauthorized persons. Wherever physical characteristics of a landfill site do not prevent entry of unauthorized persons, a 1.8 metre (minimum) chain link fence should be erected around the perimeter of the landfill. This fence will meet the requirement for litter control, see above.

Entry to the landfill should be controlled by a staffed gatehouse located at the entry to the landfill; no other entry point to the landfill should exist. A lockable gate should be used to prevent entry during times that the landfill is closed. Days and hours of landfill operation should be stated in clear lettering on a sign measuring 1 metre by 0.7 metres (minimum dimensions).

9. *Flexibility of operation.* Waste management operations other than landfilling may be appropriately conducted within a landfill site property. In particular, these operations include centralized composting, separation/processing of recyclable wastes and storage of wastes that may require ultimate management elsewhere. Landfills should be designed to accommodate the range of facilities that may appropriately be sited at the landfill location.
10. *Access roads.* Access to the landfill should be by all weather road designed and constructed to carry heavy-duty vehicles. Crossings of watercourses should be by culvert or by single-span structures; structures should not



be built in watercourses. Watercourse crossings should be designed to withstand flood conditions (once in 25 year storms).

11. *Closure plan.* The preparation of designs for a landfill should identify the steps and measures to be taken to close the landfill at the end of its useful life in order to ensure that the landfill does not result in negative environmental and social impacts following its use.

### **Operating Standards**

Operating standards ensure that following the design and construction of a landfill, operations are conducted in such a way as to ensure that the landfill operates with a minimum of negative impact on the environment and on adjacent communities. The following operating standards should be adopted as minimum standards for the operation of landfills.

1. *Acceptable waste types.* Only wastes for which a landfill is designed should be accepted at the landfill site. Where facilities other than those associated with landfilling are implemented at a landfill site (e.g. centralized composting, separation/processing of recyclable wastes etc), management and operational procedures should be put in place to ensure that particular loads of waste are directed to the appropriate location within the landfill site area.
2. *Site security.* All vehicles entering the landfill should be recorded and should be required to produce a valid permit for the waste that they haul, consistent with country requirements for such permits. Any vehicle operator that produces a permit that is not valid for the vehicle that is being operated should be reported immediately to the senior operational officer of the national waste management entity. However, the vehicle should be permitted entry to the landfill site for the purpose of discharging the waste. All vehicles entering the site should be required to travel as directed by the landfill attendant, and should be required to deposit their waste only where and when directed by the attendant. Vehicles should be required to proceed as directed by the attendant for the purposes of recording the weight of waste in the vehicle, billing arrangements etc.

No person should be allowed to enter the landfill site unless they are a duly authorized employee working or with business at the landfill site, a person who wishes to deposit waste, or other person with the written permission of the senior operational officer of the waste management entity to enter the site. Any individual or group of individuals permitted entry who is not an employee at the site or in the business of depositing waste should be accompanied on-site by a site employee for the purpose of ensuring the safety of the individual while on-site. Any individual on-site without authority should be requested to leave unless they have legitimate business at the site; the assistance of the police should be requested if the individual is uncooperative.

3. *Landfill cells.* Landfills should be operated on the basis of cells that should be constructed and implemented according to a pre-determined sequence and according to the rate of filling of previous cells. The location of future cells may be used for parallel activities such as centralized composting or aspects of waste processing that do not require fixed facilities until such time as the future cell requires construction. At that time, the activities that had been undertaken on the land required for the new cell may be moved to the cell that has been closed.
4. *Storm water management.* Temporary storm water management systems, such as ditches, should be installed to prevent the entry of storm water falling on the site to areas where waste is being actively managed. Temporary storm water management facilities should tie into the facility's stormwater retention pond. The pond should be dredged periodically, as necessary to ensure that the capacity of the pond is maintained; sediment may be used as landfill cover. The banks of the pond and permanent ditches should be vegetated with plants characterised by dense root mats to prevent erosion. The point of discharge from the pond as well as all ditches should be checked periodically and after major storms and debris should be removed.
5. *Leachate management.* Any valves associated with the leachate collection system should be periodically checked and maintained as necessary, together with any pumps and other movable pieces of equipment. Manholes should be checked and sediment should be removed periodically. Entry into manholes should not be undertaken, as landfill gas may have built up creating conditions dangerous to human health; work in manholes should be undertaken with caution due to the risk of explosion if landfill gas concentrations have built up. Leachate collection piping should be flushed annually.
6. *Landfill gas management.* Landfill gas vents should be installed according to the schedule established in the design of the landfill. The vents should be clearly marked so that they are not damaged by heavy equipment. Three options exist for landfill gas management; (i) the vents can passively allow the escape of landfill gas to the atmosphere; (ii) the gas can be flared, which burns the methane (a major "greenhouse gas") in landfill gas and greatly reduces the contribution of the gas to the "greenhouse effect"; or (iii) the landfill gas can be collected and used to run a turbine to generate electricity.
7. *Application of cover materials.* Waste should be covered at the end of each working day. If soil is used, at least 10 centimetres of soil should be used to cover the waste. Use of soil results in loss of landfill capacity. A geosynthetic material may be applied as an alternative, and removed the following day.

A completed cell should have an additional 15 centimetres (minimum) of interim cover material added to it if a waste lift is to be constructed above the cell in future. A final cover of 1 metre (minimum), of which the top 15 centimetre (minimum) should be topsoil, should be applied to the final contours of the landfill. Interim and final covers should be planted or seeded with species that have dense, but shallow, root mats in order to prevent erosion of the cover material while at the same time not disturbing the buried waste.

8. *Access roads.* Access roads should be maintained in good year round repair suitable for use by heavy vehicles. Ditches should be kept free of debris.
9. *Access to working face.* Temporary roads should be constructed on-site to allow access to the working face of the landfill. These roads should be made of granular materials and graded to encourage the shedding of water. Where roads cross steep slopes, such as the working face or for access to upper waste lifts, the roads should be constructed to follow a diagonal route across the slope. When the roads are no longer needed, the materials should be excavated to construct new roads, as necessary, and the route of the old road should be excavated to a depth of 1 metre and backfilled with coarse material to ensure the downward migration of leachate towards the leachate collection system.
10. *Site facilities.* All site structures should be maintained in good repair. All signs should be maintained in good repair and should be clearly and easily legible.
11. *Equipment.* Site equipment should be maintained in a state of good working order. Maintenance schedules should be adhered to, no unauthorized use - on-site or off-site - of equipment should be entertained, and necessary repairs should be promptly undertaken by qualified staff. Equipment should be securely stored in a weatherproof building.
12. *Dust control.* Water should be applied to working surfaces as necessary to control dust. Stockpiles of cover material should be compacted and, if not to be used for a period of at least 6 months, should be seeded with a suitable groundcover to control dust. The access road should be kept swept so that dust is not thrown up by heavy vehicles.
13. *Litter control.* All vehicles hauling wastes should be required to cover their loads. Portable litter control fences of approximately 3.5 metres high should be placed immediately downwind of the working face of the landfill to catch any litter that is blown by the wind. The perimeter fence will catch litter that escapes the litter control fence. Litter should be removed from both fences daily or as needed to maintain sanitary conditions at the site.

After significant wind events, areas immediately beyond the landfill should be checked to determine if litter has escaped the landfill and any such litter should be collected. The size of the working face should be minimized and waste deposited at the working face should be promptly covered. All waste deposited should be covered at the end of the working day.

14. *Noise control.* Noise at the landfill property boundary should not exceed 70 decibels for more than 5 minutes at a time during the working hours of the landfill; if residential neighbourhoods are located in close proximity, efforts should be made to reduce this level further. All motors should be equipped with sound muffling devices in good working order. The landfill should normally be operated only between the hours of 09:00 and 17:00.
15. *Odour control.* The working face of the landfill should be kept as small as possible and waste should be covered at the earliest opportunity; all waste should be covered at the end of the working day. Particularly odorous wastes should be covered immediately. Cover should be inspected periodically to identify gaps in cover, washouts, uncapped wells or boreholes or other routes by which odour might escape from the buried waste. If odour is detected at the leachate retention pond, the pond should be agitated; if odour persists, the pond should be equipped with aerators.
16. *Vector/vermin control.* Vectors are attracted by standing water and all potential causes of standing water should be removed, except for the storm water retention pond and leachate retention pond. If either of these attract vectors they should be treated with the minimum amount of insecticide necessary to remedy the problem, but not so much as to interfere with biological function in the receiving water course or environment. Surfaces within the landfill should be filled or graded to prevent the ponding of water. Materials in which water may pond should not be exposed to wet weather in such a way as to allow accumulation of water at the site.

Vermin are attracted to rotting or decaying waste and should be controlled by application of many of the procedures associated with odour control (see 15 above). A persistent vermin problem should be addressed by a licensed pest control officer or exterminator.
17. *Bird control.* Cover materials should be promptly applied to the waste deposited at the landfill. In the event of continuing bird problems, bird scare techniques such as use of a device to issue periodic, random loud noise bursts may be used, provided such devices do not unreasonably interfere with adjacent populations of wild animals and birds.
18. *Worker health and safety.* Protective clothing to be worn at the site should include hearing protection to be worn by equipment operators and those working in the vicinity of heavy equipment, hard hats, gloves, safety glasses or goggles, safety vest, steel-capped safety boots, and, for those operating

heavy equipment or working on or in the vicinity of the landfill, dust mask. This equipment should be issued to employees and it should be a condition of employment that it is worn during working hours.

All local occupational health and safety requirements should be observed. In addition, to the extent they are not explicitly covered by such requirements, the following should be undertaken: (i) rejection of all prohibited wastes from disposal; (ii) inspection of all loads of waste tipped at the working face and separation of any suspicious wastes of unknown origin; (iii) driving only on designated landfill roads; (iv) use of safety cones and signage to clearly direct traffic movements; (v) assurance of immediate deep burial at least 2 metres deep of quarantine waste; (vi) maintenance of clear separation distance between heavy equipment and the unloading of waste at the working face of the landfill; (vii) ensure that no loitering takes place at the working face; (viii) ensure that only those actively unloading waste leave their vehicle and then only for the purpose of unloading the waste.

Heavy equipment should be inspected for visible signs of wear and tear before use each day. If there is evidence of wear and tear that may compromise the safety of the equipment, the problems should be documented, reported and the equipment repaired before use. Equipment should travel slowly, not normally exceeding 5 mph. Loader buckets should be carried low and all heavy equipment should be fitted with a back-up warning signal and strobe light for automatic use when proceeding in reverse. No equipment should be used that has not been maintained according to its maintenance schedule. Clear separation of at least 5 yards should be maintained between vehicles depositing waste at the tipping face and heavy equipment.

19. *Emergency Response.* The landfill operator will maintain fire-extinguishing capacity sufficient to extinguish small fires, and will activate that capacity as necessary. Fires will be reported by the landfill operator to the Fire Department, if one exists, immediately.

Spills of flammable, hazardous or environmentally-contaminating materials will immediately be contained. The following absorbent materials will be used to clean up spills of liquids, all of which should be stored at the landfill in sufficient quantity to absorb a minimum of 200 litres spilled: (i) oil spill pads for clean up of motor oil; (ii) soda ash or lime for clean up of acids; (iii) boric acid crystals for clean up of caustic spills; (iv) sorball, vermiculite, peat moss or other similar absorbent material for other and general purpose spill clean up. Clean up materials contaminated with these substances should be managed as hazardous waste. All spills will be documented by the landfill manager regarding: (i) the material spilled; (ii) the cause of the spill; (iii) action taken to clean up the spill; and (iv) measures proposed to ensure similar circumstances do not arise in future

to cause a spill. A copy of the spill report will be forwarded to the General Manager of the Solid Waste Management operator.

A detailed contingency plan will be prepared by the operator in the event of a major fire, spill of hazardous waste or other hazardous material or natural disaster. The contingency plan will be filed with the national disaster preparedness (or equivalent) office.

20. *Complaints.* All complaints received from the public will be noted and action taken in response to each complaint will be documented.

Odour will be monitored periodically at the site boundary. Frequent levels of offensive odours will be cause for an on-site audit of operational practices to determine the cause of odour.

21. *Monitoring.* The rate of landfill filling will be determined at least 2 times per year in order to revise estimates regarding the remaining life of a cell and the landfill as a whole.

During landfill operations and for a period of 10 years following the closure of the landfill groundwater quality and surface water quality should be monitored to verify the integrity of the base of the landfill to contain leachate. Groundwater and surface water should be sampled two times per year and analyzed by a competent laboratory; one sample should be obtained during the dry season and one sample should be obtained during the rainy season.

Samples of groundwater should be obtained from monitoring wells located by, and installed under the supervision of, a hydrogeologist. At least one sample should be taken from each of groundwater and adjacent surface water immediately upgradient/upstream from the area to be landfilled. At least 3 samples of groundwater should be taken from the downgradient boundary of the landfill property. At least one sample of surface water should be taken from either: (i) within 50 downstream metres of the point at which leachate is discharged into the watercourse; or, if leachate is not discharged into the watercourse, (ii) from the point in an adjacent watercourse generally in line with the downstream boundary of the landfill boundary. Each time sampling is undertaken a sample should be obtained from each monitoring well using a protocol to ensure the provision of untainted samples, and which protocol is accepted by the laboratory that will analyze the samples.

Samples should be analyzed for, at a minimum, the parameters identified in Table D.1. Quality criteria for each parameter in Table D.1 should be established having consideration for the use to which ground or surface water will be put and the sensitivity of the receiving environment to contaminants. Guidelines published by the World Health Organization

and those of other countries that have received international recognition (e.g. those of Environment Canada) may be helpful in these regards. Exceedances of criteria may require application of remedial measures, such as installation of a cut-off collector to intercept contaminated groundwater that escapes from the site.

Conformance with the conditions of operation cited on the License to operate the landfill should be continually monitored to ensure compliance with License conditions.

22. *On-site documentation.* Copies of the following documentation should be retained on-site: (i) the License to operate the facility; (ii) the operating procedures for the facility; (iii) complaint monitoring forms; (iv) emergency response plans, procedures and monitoring forms; (v) monitoring forms for all monitoring activities identified above; (vi) vehicle maintenance and inspection report forms.

**Table D.1**  
**Groundwater and Surface Water Monitoring Parameters**

Calcium	Sulphate
Sodium	Carbonate
Potassium	Bicarbonate
Iron	Alkalinity
Magnesium	Biological Oxygen Demand
Chloride	Ammonia
Nitrate	Conductivity
Nitrite	pH
Heavy metals	

Every two years analysis should be undertaken for volatile organic compounds (VOC's) in groundwater.

**COMPOST FACILITIES**

Composting is undertaken in facilities that range in size from backyard in scale to those that compost tens of thousands of tonnes of material per year. Larger facilities have greater potential negative impacts associated with them than smaller facilities. Accordingly, four levels of compost facilities are recognised for the application of compost facility standards, with different types and levels of standards applied to each:

1. *Backyard.* Backyard composting is undertaken on the land occupied by a householder or a business. If the backyard composting facility is at a place of business (e.g. a hotel), the facility will be considered a “backyard composting facility” only if the waste to be composted is yard and brush waste; if any other waste are included in the composting, the facility will be regulated as an “on-site IC&I facility”. No regulatory standards are associated with backyard composting, although public education should educate residents about good backyard composting practices.
2. *On-Site IC&I composting facilities.* These facilities compost organic wastes other than, or in addition to, yard and brush wastes generated by the IC&I establishment on whose site the composting facility is located. In addition, and by definition, on-site IC&I composting facilities receive not more than 2,000 tonnes of compostable waste per year. The verification that such facilities do not receive more than this quantity can be based on the provision of a reasonable estimate by the generator of the annual amount of organic waste they intend to compost at the facility.
3. *Neighbourhood composting facilities.* Neighbourhood composting facilities are those which receive materials for composting from a neighbourhood, or from a number of small communities, or from a number of commercial generators, or some combination of these. In addition, and by definition, neighbourhood composting facilities receive not more than 2,000 tonnes of compostable waste per year. The verification that such facilities do not receive more than this quantity can be based on the average amount of organic waste generated per household in the area served by the facility, and by requiring large commercial generators to provide a reasonable estimate of the annual amount of organic waste they intend to deliver to the facility.
4. *Centralized composting facilities.* These facilities receive more than 2,000 tonnes per year of organic materials for composting.



**Siting Standards**Backyard

Although no regulatory standards are associated with the siting of backyard composting facilities public education should stress that they should be located with sensitivity to neighbours and adjacent public areas.

On-Site IC&I Composting Facilities

On-site IC&I composting facilities should be located:

1. At least 25 metres from the nearest watercourse.
2. On land that is not within a flood plain as measured by a once in 25 year storm.
3. At least 5 metres from the nearest residence or building that is a place of work.
4. Adjacent to a road with an all-weather surface.

Neighbourhood Composting Facilities

Neighbourhood-scale composting facilities should be located:

1. At least 25 metres from the nearest watercourse.
2. On land that is not within a flood plain as measured by a once in 25 year storm.
3. At least 50 metres from the nearest residence or building that is a place of work.
4. Adjacent to a road with an all-weather surface.
5. Facilities should be secured so as to prevent entry by animals.

Centralized Composting Facilities

There are two basic types of centralized composting facility: (i) systems that conduct the composting process utilizing open windrows; and (ii) those that employ mechanical, enclosed technology. Mechanical, enclosed systems are capital and energy intensive and not considered to constitute appropriate technology for OECS countries. Accordingly, the standards and guidelines below relate to open-windrow systems, which may be more appropriately implemented in OECS countries.

To the extent possible, open windrow composting systems should be located:

1. On soils with a minimum depth of 3 feet and a uniform water permeability of  $10^{-6}$  cm/second or less.
2. Within topography that minimizes the extent of civil works necessary to prepare the composting site.

3. On land previously used for waste disposal.
4. In rain shadows or other areas of low rainfall.
5. In areas where the prevailing winds are of low velocity and blow offshore.
6. In areas not susceptible to wind or water damage as a result of a hurricane or storm.
7. In areas that do not require the forced resettlement of individuals.
8. At least 50 metres from the nearest watercourse or salt water.
9. On land that is not within a flood plain as measured by a once in 25 year storm.
10. At least 50 metres from the nearest residence or building that is a place of work.
11. Adjacent to a road with an all-weather surface.
12. Facilities should be secured so as to prevent entry by animals.

Open windrow composting systems sited within a landfill area will be deemed to meet these siting requirements. Where such composting facilities are not located within a landfill area, suitable composting locations should be determined through the weighting of these criteria and their application according to their weighted significance. The weighting of criteria should be undertaken with public input.

### **Design Standards**

#### Backyard Composting

No regulatory design standards apply to backyard composting. Materials for composting can be piled in a heap. Alternatively, a compost container can be employed. A suitable container would be made from building blocks or wood and would measure approximately 1 metre x 1 metre x 1 metre. A lid is optional. The sides should, ideally, be constructed to allow the passage of air, but this is not essential if bulky materials are periodically added to the compost pile to allow aeration. On the front of the structure, a space should be left at the bottom to allow the removal of finished compost.

#### On-Site IC&I Composting Facilities

The size and nature of feedstock associated with on-site IC&I composting facilities, together with the proximity of these facilities to residential buildings and places of work, requires that this type of composting be conducted in an enclosed structure. The structure may be as described above for backyard composting, and several such structures may be placed in a cluster to accommodate the quantity of materials generated. Facilities should be secured so as to prevent entry by animals and unauthorized individuals.

#### Neighbourhood Composting Facilities

As with on-site IC&I composting, the size and nature of neighbourhood composting facilities requires application of precautions to ensure that the composting is undertaken in ways that are protective of the environment and adjacent residents. The type of container described for backyard composting (see above) may be used, grouped as necessary to accommodate the amount of material to be composted. Alternatively, windrows (see “Operating Standards - Centralized Composting” point 2, below) may be used, in which case greater reliance will be placed on operating practices to control potential negative impacts on the environment and adjacent communities. In either case, neighbourhood composting facilities should be secured to prevent entry by animals and to educate individuals on the correct composting procedures.

#### Centralized Composting Facilities

The scale and nature of centralized composting facilities may result in significant potential negative impacts. Accordingly, design requirements associated with centralized composting facilities are more stringent than those associated with other types of composting. In many cases, similar design standards to those of a landfill are required. However, if the centralized composting facility is located within a landfill location, the composting facility should be deemed to have met the design standards that follow:

1. *Storm water control.* Storm water control refers to the management of surface water flowing into or over a landfill site. Storm water entering a centralised composting facility can disrupt composting operations, flood the facility, carry detritus from the facility and increase leachate quantities. Designs should ensure that drainage works are incorporated to: (i) intercept any watercourses (permanent or seasonal) that cross the site; and (ii) catch and divert surface water that may enter the site during or following a precipitation event whether or not such water is in a “watercourse”. Drainage works should be sized to ensure that surface water will not enter the site even under the most extreme conditions under which the facility is likely to operate, which may be defined to equate to a once in 25 years storm. Drainage works carrying storm water from the site should discharge to a watercourse or the marine environment. If this is not feasible, storm water should be discharged into the natural environment in such a way that the velocity and quantity of water so discharged does not result in erosion of the land onto which the discharge takes place. A storm water retention pond should typically be included in the stormwater management system to regulate the rate of discharge of stormwater to the receiving environment, and to allow the settling of sediments and suspended solids carried by stormwater.
2. *Leachate collection.* In order to protect against the uncontrolled release of leachate, the permeability throughout the top 3 feet of ground beneath the compost area should be no greater than  $10^{-6}$  centimetres/second if

there are receptors downgradient from the compost facility that are sensitive to any of the parameters recommended to be monitored in Table D-1. There should be no cracks or porous zones within this depth. Achievement of this standard may require the placement of natural or artificial materials. Alternatively, a synthetic landfill liner may be installed to prevent the escape of leachate; such a liner should have flexibility to absorb the pressures of composting and should be installed according to engineering specifications recommended by the supplier and verified by a qualified engineer to preserve the integrity of the liner.

The base under a centralized composting facility should be designed with a minimum 3 percent stable slope. Leachate collection pipes or drains should be installed at the downhill end of the slope and should be designed to carry leachate to a retention pond. Subject to site specific recommendations of a design consultant, the leachate retention pond should be sized to accommodate leachate generation associated with the wettest one month period in 25 years and should preferably be located at the lowest point of the composting site.

3. *Management of collected leachate.* Collected leachate should be re-circulated through the composting material. Composting typically involves a net loss of moisture, and the re-circulation of leachate in this way can speed up the composting process, as well as provide effective treatment of leachate.
4. *Litter control.* The escape of litter from a centralized composting facility can be prevented through erection of a 1.8 metre (minimum height) high perimeter fence, combined with effective operational controls (see below).
5. *Site security.* In some instances, the physical features associated with the location of a centralized composting facility may result in high levels of site security; for example, a facility located in a quarry in which rock faces effectively prevent entry by unauthorized persons. Wherever physical characteristics of a composting site do not prevent entry of unauthorized persons, a 1.8 metre (minimum height) chain link fence should be erected. This fence will also be effective for control of litter, see above.

Entry to the composting facility should be controlled by a staffed gatehouse located at the entry to the facility; no other entry point to the facility should exist. A lockable gate of heavy duty construction should be used to prevent entry during times that the facility is closed. Hours of compost facility operation should be stated in clear lettering on a sign measuring at least 1 metre x 0.7 metres

6. *Access roads.* Access to the composting facility should be by all weather road designed and constructed to carry heavy-duty vehicles. Crossings of watercourses should be by culvert or by single-span structures;

structures should not be built in watercourses. Watercourse crossings should be designed to withstand flood conditions (once in 25 year storms).

7. *Facility Closure.* Closure plans should be developed as a component of facility design. These plans should specify the actions that will be taken to close the facility in such a way as to ensure that negative environmental and social impacts associated with the closure phase and beyond are adequately mitigated.

### **Operating Standards**

#### Backyard Composting

No regulatory design standards are associated with backyard composting. However, public education in support of backyard composting should effectively convey the following points:

1. Backyard composting is primarily a means of managing yard waste and kitchen vegetable and fruit wastes. No meat, meat products, fats or dairy products should be placed in a backyard composting system. These materials attract rodents/vermin.
2. Some materials take longer than others to compost. Very fibrous materials (e.g. coconut husks), rigid materials (e.g. egg shells, coconut shells) and wood (e.g. branches) may take a longer time to compost than other materials.
3. Materials should be piled as they are generated to a height of not more than about 1 metre.
4. Backyard compost piles should be moist for rapid composting; the speed of composting may decrease during extended dry periods.
5. If the compost pile emits strong offensive odours, this is probably caused by insufficient air reaching all parts of the compost pile. The compost pile should be aerated by turning and adding bulky material, such as sticks, and should be covered with 10 centimetres of soil.

#### On-Site IC&I Composting Facilities

On-site IC&I composting facilities should be required to maintain the following operational standards:

1. No meat, meat products, fats or dairy products should be placed in an on-site commercial composting system. These materials attract rodents/vermin.
2. If the compost pile emits strong offensive odours, this is probably caused by insufficient air reaching all parts of the compost pile. If offensive odours occur, the operator should immediately aerate the compost pile by turning and adding bulky material, such as sticks, and should immediately cover the pile with 10 centimetres of soil or finished compost.

### Neighbourhood Composting

Neighbourhood composting facilities should be required to maintain the following operational standards:

1. No meat, meat products, fats or dairy products should be placed in a neighbourhood composting system. These materials attract rodents/vermin.
2. If the compost pile emits strong offensive odours, this is probably caused by insufficient air reaching all parts of the compost pile. If offensive odours occur, the operator should immediately aerate the compost pile by turning and adding bulky material, such as sticks, and should cover the pile with 10 centimetres of soil.
3. The composting mass should be turned approximately every week until heat is no longer generated within the composting material. Following each turning, the composting material should be covered with at least 10 cm. of soil or finished compost.

### Centralised Composting

The following operating standards should be adopted at all centralized composting facilities, whether or not they are located within a landfill area:

1. *Acceptable waste types.* All organic waste materials may be accepted at a centralized windrow composting facility, except that no meat, meat products, fats or dairy products should be placed in a windrow-based centralized composting system. These materials attract rodents and vermin.
2. *Size of windrow.* A windrow is a linear pile of material that is triangular in cross section. Windrows for composting may be as long as is convenient. At the base, the windrow should be approximately 3.0 - 3.5 metres; the vertical distance from ground to apex in cross section should be approximately 2.5 - 3.0 metres.
3. *Temperature monitoring.* As materials compost the temperature of the compost mass increases. The temperature in the interior of the compost should be monitored daily with a temperature probe; temperature should be monitored every 3 metres for the length of the windrow. Readings should be recorded for each temperature reading station. A minimum temperature of 55°C should be achieved for 3 continuous days during the composting process.
4. *Turning of compost.* The windrow should be turned after the temperature in the compost mass has reached 55°C for 3 consecutive days. Achievement of 55°C for 3 consecutive days is important if the application to which the compost will be put requires a high level of certainty that any pathogens in the compost have been killed. Immediately following the turning, the temperature of the compost will be lower than prior to the

turning; however, the compost will begin to heat again. The compost should be periodically turned when the temperature monitoring shows that the temperature of the mass begins to fall. If the temperature reaches 70°C the compost should be turned in order to lower the temperature. One week following the stabilization of the compost mass, the compost should be moved to a curing/storage location.

5. *Application of cover materials.* Organic materials to be composted should be covered with at least 10 cm of soil or finished compost immediately following their placement for composting and following the turning of the compost in order to control any odour that may be associated with the compost windrow.
6. *Moisture content of compost.* The organisms that are responsible for composting activity are most active when the moisture content of the compost is in the vicinity of 60%, and effort should be made to maintain this moisture level for most efficient composting.
7. *Odour control.* Cover should be inspected periodically to identify gaps in the cover or other routes by which odour might escape from the composting materials. Soil or finished compost should be used to fill any gaps in the cover materials that are identified.
8. *Curing/Storage.* Following temperature stabilisation, compost should be stored. During the storage period, the compost may continue to undergo a low level of biological action, termed “curing” before becoming completely stabilized.
9. *Quarantine wastes.* No wastes which are “quarantine wastes” should be accepted for composting.
10. *Site facilities.* All site facilities should be maintained in good repair. All signs should be maintained in good repair and should be clearly and easily legible. Sufficient space should be available between windrows to allow a front-end loader access to the windrows.

The following standards should be considered if the centralized composting facility is located outside a landfill. If the centralized composting facility is located in a landfill, the composting facility should be deemed to have met the design standards that follow.

1. *Site security.* All vehicles entering the centralized composting site should be recorded and should be required to produce a valid permit for the waste that they haul, consistent with country requirements for such permits. Any vehicle operator that produces a permit that is not valid for the vehicle that is being operated should be reported immediately to the operations manager of the national waste management entity. However, the vehicle

should be permitted entry to the centralized composting site for the purpose of discharging the waste. All vehicles entering the site should be required to travel as directed by the site attendant, and should be required to deposit their waste only where and when directed by the attendant. Vehicles should be required to proceed as directed by the attendant for the purposes of recording the weight of waste in the vehicle, billing arrangements etc.

No person should be allowed to enter the centralized composting site unless they are a duly authorized employee working or with business at the site, a person who wishes to deposit waste, or other person with the written permission of the operations manager of the waste management entity to enter the site. Any individual or group of individuals permitted entry who is not an employee at the site or in the business of depositing waste should be accompanied on-site by a site employee for the purpose of ensuring the safety of the individual while on-site. Any individual on-site without authority should be requested to leave unless they have legitimate business at the site; the assistance of the police should be requested if the individual is uncooperative.

2. *Storm water management.* Temporary storm water management systems, such as ditches, should be installed to prevent the entry of storm water falling on the site to areas where waste is being actively composted. Temporary storm water management facilities should tie into the facility's stormwater retention pond. The pond should be dredged periodically, as necessary to ensure that the capacity of the pond is maintained; sediment may be used as compost cover. The banks of the pond and permanent ditches should be vegetated with plants characterised by dense root mats to prevent erosion. The point of discharge from the pond as well as all ditches should be checked periodically and after major storms and debris should be removed.
3. *Leachate management.* Any valves associated with the leachate collection system should be periodically checked and maintained as necessary, together with any pumps and other movable pieces of equipment. Leachate collection piping should be flushed annually. Collected leachate should be re-circulated through the composting mass.
4. *Access roads.* Access roads should be maintained in good year round repair suitable for use by heavy vehicles. Ditches should be kept free of debris.
5. *Dust control.* Water should be applied to working surfaces as necessary to control dust. Stockpiles of cover material should be compacted and, if not to be used for a period of at least 6 months, should be seeded with a suitable groundcover to control dust. The access road should be kept swept so that dust is not thrown up by heavy vehicles.



6. *Litter control.* All vehicles hauling wastes should be required to cover their loads. The perimeter fence will catch litter, and litter should be collected from the fence as required to maintain a cleanly site condition.
7. *Noise control.* Noise at the landfill property boundary should not exceed 70 decibels for more than 5 minutes at a time during working hours; if residential neighbourhoods are located in close proximity, efforts should be made to reduce this level further. All motors should be equipped with sound muffling devices in good working order. The composting site should be operated only between the hours of 09:00 am and 17:00.
8. *Odour control.* If strong odour is detected at the leachate retention pond, the pond should be agitated; if odour persists, the pond should be equipped with aerators.

If strong odour is detected from the composting material, the window should be turned immediately, rebuilt and covered with at least 10 cm of soil or finished compost.

9. *Vector/vermin control.* Vectors are attracted by standing water and all potential causes of standing water should be removed, except for the storm water retention pond and leachate retention pond. If either of these attract vectors they should be treated with the minimum amount of insecticide necessary to remedy the problem, but not so much as to interfere with biological function in the receiving water course or environment. Surfaces should be filled or graded to prevent the ponding of water. Materials in which water may pond should not be exposed to wet weather in such a way as they allow accumulation of water at the site.

Vermin are attracted to uncovered rotting or decaying waste and should be controlled by application of many of the procedures associated with odour control and coverage of materials while they are composting. A persistent vermin problem should be addressed by a licensed pest control officer or exterminator.

10. *Bird control.* Cover materials should be promptly applied to the waste deposited at the composting site. In the event of continuing bird problems, bird scare techniques such as use of a device to issue periodic, random loud noise bursts may be used, provided such devices do not interfere with adjacent populations of wild animals and birds.
11. *Worker health and safety.* Protective clothing to be worn at the site should include hearing protection by equipment operators and those working in the vicinity of heavy equipment, hard hats, gloves, safety glasses or goggles, safety vest and steel-capped safety boots. This equipment should be issued to employees and it should be a condition of employment that it is worn during working hours.

All local occupational health and safety requirements should be observed. In addition, to the extent they are not explicitly covered by such requirements, the following should be undertaken: (i) rejection of all unsuitable materials from composting; (ii) inspection of all loads of waste deposited for composting and separation of any suspicious wastes of unknown origin; (iii) driving only on designated roads; (iv) use of safety cones and signage to clearly direct traffic movements; (v) maintenance of clear separation distance between heavy equipment and the unloading of waste at the working face of the landfill; (vi) ensure that no loitering takes place at the composting site; (vii) ensure that only those actively unloading waste leave their vehicle and then only for the purpose of unloading the waste.

Heavy equipment should be inspected for visible signs of wear and tear before use each day. If there is evidence of wear and tear that may compromise the safety of the equipment, the problems should be documented, reported and the equipment repaired before use. Equipment should travel slowly, not normally exceeding 5 mph. Loader buckets should be carried low and all heavy equipment should be fitted with a back-up warning signal and strobe light for automatic use when proceeding in reverse. No equipment should be used that has not been maintained according to its maintenance schedule. Clear separation of at least 5 yards should be maintained between vehicles depositing waste and heavy equipment.

12. *Emergency Response.* The landfill operator will maintain fire-extinguishing capacity sufficient to extinguish small fires, and will activate that capacity as necessary. Larger fires will be reported by the compost facility operator to the Fire Department, if one exists, immediately. A detailed contingency plan will be prepared by the operator in the event of a major fire or natural disaster; the contingency plan will be filed with the national disaster preparedness (or equivalent) office.
13. *Complaints and monitoring.* All complaints received from the public will be noted and action taken in response to each complaint will be documented.

Odour will be monitored periodically at the site boundary. Frequent levels of offensive odours will be cause for an on-site audit of operational practices to determine the cause of odour.

During operations groundwater quality and surface water quality should be monitored to verify the integrity of the base of the facility to contain leachate. Groundwater and surface water should be sampled two times per year and analyzed by a competent laboratory; one sample should be obtained during the dry season and one sample should be obtained during the rainy season.

Samples of groundwater should be obtained from monitoring wells located by, and installed under the supervision of, a hydrogeologist. At least one sample should be taken from each of groundwater and adjacent surface water immediately upgradient/upstream from the area to be compost facility. At least 3 samples of groundwater should be taken from the downgradient boundary of the property. At least one sample of surface water should be taken from either: (i) within 50 downstream metres of the point at which leachate is discharged into the watercourse; or, if leachate is not discharged into the watercourse, (ii) from the point in an adjacent watercourse generally in line with the downstream boundary of the landfill boundary. Each time sampling is undertaken a sample should be obtained from each monitoring well using a protocol to ensure the provision of untainted samples, and which protocol is accepted by the laboratory that will analyze the samples.

Samples should be analyzed for, at a minimum, the parameters identified in Table D.1. Quality criteria for each parameter in Table D.1 should be established having consideration for the use to which ground or surface water will be put and the sensitivity of the receiving environment to contaminants. Guidelines published by the World Health Organization and those of other countries that have received international recognition (e.g. those of Environment Canada) may be helpful in these regards. Exceedances of criteria may require application of remedial measures, such as installation of a cut-off collector to intercept contaminated groundwater that escapes from the site.

Conformance with the conditions of operation cited on the License to operate the centralized composting facility should be continually monitored to ensure compliance with License conditions.

14. *On-site documentation.* Copies of the following documentation should be retained on-site: (i) the License to operate the facility; (ii) the operating procedures for the facility; (iii) complaint monitoring forms; (iv) emergency response plans, procedures and monitoring forms; (v) monitoring forms for all monitoring activities identified above; (vi) vehicle maintenance and inspection report forms.

#### **RECYCLABLE MATERIALS PROCESSING FACILITIES**

Processing facilities for recyclable materials are industrial facilities whose impacts are similar to light manufacturing plants. Generally, they should be sited, designed and operated in a similar manner to light industrial plants.

##### Siting

Processing facilities for recyclable materials should be located at either a landfill site or in an industrial area; locations accessible by cargo vessel may be preferred if the materials to be processed are to be sold to overseas markets. Siting of

facilities for processing recyclable materials outside a landfill site area should be undertaken consistent with local procedures for siting of industrial facilities.

#### Design

If the recyclable materials processing facility is located at a landfill site area, several of the design considerations identified below will have been addressed in the design of the landfill site area. In the event that a recyclable materials processing facility is located outside a landfill area, each of the following design considerations will need to be addressed.

1. *General design considerations.* Recyclable materials processing facilities should be housed in weatherproof and hurricane-proof buildings with full access to electrical services and water supply compatible with the operations of the facility. The floor should be constructed of concrete slab. Specific criteria for general building requirements should be developed with consideration of local construction requirements for manufacturing facilities.
2. *Performance standards.* Recyclable materials processing facilities should process recyclable materials to the specifications demanded by the end-user of the materials. Specifications in these regards typically relate to the level of sorting of materials that is necessary, the density of materials and the format of delivery (e.g. bale or container size) to the end user.
3. *Storage of recyclable materials* Storage areas should be designed appropriate for the materials to be processed. Storage areas will be required for materials prior to processing and for materials awaiting transportation to an end-user. Operational considerations impacting on design in these regards are discussed under "Operations", below.
4. *Processing of recyclable materials.* Sufficient space should be designed into the recyclable materials processing facility to allow for the ready access and movement of light vehicles (e.g. forklift trucks) to move materials around, as necessary for the processing and storage of the materials. All processing equipment should be equipped with emergency stop mechanisms.
5. *Storm water management.* Storm water should be drained from the site of the recyclable materials processing facilities, and should not be permitted entry into the structures housing these facilities. Storm water should be discharged into the drainage system serving the area in which the facilities are located.
6. *Access roads.* Access to the facilities should be by all weather road designed and constructed to carry heavy-duty vehicles. Crossings of watercourses should be by culvert or by single-span structures; structures

should not be built in watercourses. Watercourse crossings should be designed to withstand flood conditions (once in 25 year storms).

7. *Site security.* Access to the site in which recyclable processing facilities are located should be controlled through a lockable gate installed in a chain link perimeter fence of a minimum height of 1.8 metres.

### Operations

If the recyclable materials processing facility is located at a landfill site area, several of the design considerations identified below will have been addressed in the design of the landfill site area. In the event that a recyclable materials processing facility is located outside a landfill area, each of the following design considerations will need to be addressed.

1. *Acceptable waste types.* Only materials included in a recycling program should be accepted at a processing facility for recyclable materials.
2. *Site security.* All vehicles arriving at a facility for processing recyclable materials should be recorded and should be required to produce a valid permit for the waste that they haul, consistent with country requirements for such permits. Any vehicle operator that produces a permit that is not valid for the vehicle that is being operated should be reported immediately to the senior operational officer of the national waste management entity. However, the vehicle should be permitted entry for the purpose of discharging the materials they are transporting provided that they are acceptable for recycling.

No person should be allowed to enter a facility for processing recyclable materials unless they are a duly-authorized employee working, or with business at the facility, or other person with the written permission of the senior operational officer of the waste management entity to enter the site. Any individual permitted entry who is not an employee at the facility or in the business of depositing materials should be accompanied on-site by a site employee for the purpose of ensuring the safety of the individual while on-site. Any individual on-site without authority should be requested to leave unless they have legitimate business at the site; the assistance of the police should be requested if the individual is uncooperative.

3. *Storm water management.* Storm water management systems, such as ditches, should be installed to prevent the entry of storm water falling on the site to areas where materials are being actively managed. Storm water should be discharged into drainage systems serving the general area in which the facility is located.
4. *Access roads.* Access roads to a recyclable materials processing facility should be maintained in good repair suitable for year round use by heavy vehicles. Ditches should be kept free of debris.

5. *Processing facilities.* Processing of recyclable materials should be undertaken in a weatherproof structure. All site structures should be maintained in good repair. All signs should be maintained in good repair and should be clearly and easily legible.
6. *Equipment.* Site equipment should be maintained in a state of good working order. Maintenance schedules should be adhered to, no unauthorized use - on-site or off-site - of equipment should be entertained, and necessary repairs should be promptly undertaken by qualified staff. Equipment should be securely stored in a weatherproof building.
7. *Dust control.* Water should be applied as necessary to control dust on unpaved outside areas. Care should be taken to ensure that water applied in this manner does not enter containers of materials either awaiting or following processing. The access road should be kept swept so that dust is not thrown up by heavy vehicles.
8. *Litter control.* All vehicles hauling materials to a recyclable materials processing facility should be required to cover their loads. The perimeter fence will catch litter that escapes within the recyclable materials processing facility compound. Litter should be removed from the fence daily or as needed to maintain sanitary conditions at the site. After significant wind events, areas immediately beyond the facility should be checked to determine if litter has escaped and, if so, the litter should be collected and recycled or disposed of, as appropriate.
9. *Noise control.* Noise at the facility property boundary should not exceed 70 decibels for more than 5 minutes at a time during the working hours of the facility; if residential neighbourhoods are located in close proximity, efforts should be made to reduce this level further. All motors should be equipped with sound muffling devices in good working order. The facility should normally be operated only between the hours of 09:00 and 17:00.
10. *Odour control.* The nature of recyclable materials processing facilities is such that strong objectionable odours from the facility should not occur. If objectionable odours are detected they will be caused by organic materials arriving at the facility in association with the recyclable materials. The following actions should be required in order to reduce objectionable odours: (i) the quality of materials arriving at the facility should be reviewed and action taken to reduce the amount of organic contaminants arriving at the facility; (ii) the schedule for emptying containers of solid waste generated at the facility should be reviewed and increased as necessary to ensure that odours are not created from the lengthy storage of solid wastes; (iii) solid waste containers should be cleaned as necessary to remove objectionable odours from wastes stuck to the sides of the containers; and (iv) lids for containers should be checked to ensure they are tight-fitting, and replaced as necessary.

11. *Wastewater.* Wastewater from facility operations should be discharged in accordance with local requirements. Facility feedstocks and operations should be reviewed; sediment traps and grates for removal of solid materials (e.g. paper, plastic etc) from wastewater should be required and should be installed as necessary with respect to the nature of facility operations.
12. *Management of reject materials.* Recyclable materials entering recyclable materials processing facilities will typically contain a small percentage of non-recyclable materials that require management as solid waste in a landfill site. The materials will be sorted from recyclable materials as a function of the processing of the recyclable materials. If the quantity of non-recyclable contaminant materials comprises more than 5 percent by weight of all materials entering the facility, steps should be taken to improve the recyclable materials collection system in order to reduce the quantity of non-recyclable contaminants.

Non-recyclable materials should be placed in solid waste containers meeting regulatory standards and should be hauled by a licensed waste hauler to a landfill for proper disposal.

13. *Materials storage.* Materials awaiting processing should be processed within one day of delivery to the facility. These materials should be stored so as to prevent: (i) blowing by wind; (ii) the entry of water into the stored materials if this will impact ability to process the materials; and (iii) the escape of odour. Generally, materials should be stored either inside or outside in containers with tight-fitting lids, wraps or tarpaulin covers. Some materials (e.g. glass) may normally be stored outside without cover since they are heavy enough not to blow away and are not impacted by rain.

Materials that have been processed should be stored in ways compatible with their sale and transportation to end-use markets. Generally, paper, plastic and metal cans should be baled and glass should be stored in a rigid container. Paper materials, in particular, should generally be stored out of the rain.

14. *Vector/vermin control.* Vectors are attracted by standing water and all potential causes of standing water should be removed. Surfaces should be filled or graded to prevent the ponding of water. Materials in which water may pond should not be exposed to wet weather in such a way as to allow accumulation of water at the site.

Vermin are attracted to rotting or decaying waste and should be controlled by application of many of the procedures associated with odour control. A persistent vermin problem should be addressed by a licensed pest control officer or exterminator.

15. *Worker health and safety.* Protective clothing to be worn at the facility should include hearing protection by equipment operators and those working in the vicinity of heavy equipment, hard hats, gloves, safety glasses or goggles, steel-capped safety boots, and dust mask. This equipment should be issued to employees and it should be a condition of employment that it is worn during working hours.

All local occupational health and safety requirements should be observed. In addition, to the extent they are not explicitly covered by such requirements, the following should be undertaken: (i) rejection of all loads which, upon visual inspection, appear to contain non-recyclable materials at levels beyond those specified by the facility; (ii) inspection of all loads of materials tipped at the facility and separation of any suspicious wastes of unknown origin; (iii) ensure that no loitering takes place at the working face; (iv) ensure that only those actively unloading waste leave their vehicle and then only for the purpose of unloading the waste.

Equipment should be inspected for visible signs of wear and tear before use each day. If there is evidence of wear and tear that may compromise the safety of the equipment, the problems should be documented, reported and the equipment repaired before use. Mobile equipment should travel slowly, not normally exceeding 5 mph. Loader buckets should be carried low and all heavy equipment should be fitted with a back-up warning signal and strobe light for automatic use when proceeding in reverse. No equipment should be used that has not been maintained according to its maintenance schedule. Clear separation of at least 5 yards should be maintained between vehicles depositing materials at the facility and mobile facility equipment.

16. *Emergency Response* The operator will maintain fire-extinguishing capacity sufficient to extinguish small fires, and will activate that capacity as necessary. Larger fires will be reported by the facility operator to the Fire Department, if one exists, immediately. A detailed contingency plan will be prepared by the operator in the event of a major fire or natural disaster; the contingency plan will be filed with the National Emergency Management (or equivalent) Office.

Spills of flammable, hazardous or environmentally-contaminating materials will immediately be contained. All spills will be documented by the facility manager regarding: (i) the material spilled; (ii) the cause of the spill; (iii) action taken to clean up the spill; and (iv) measures proposed to ensure similar circumstances do not arise in future to cause a spill.

17. *Complaints and monitoring.* All complaints received from the public will be noted and action taken in response to each complaint will be documented.



Conformance with the conditions of operation cited on the License to operate the landfill should be continually monitored to ensure compliance with License conditions.

18. *On-site documentation.* Copies of the following documentation should be retained on-site: (i) the License to operate the facility; (ii) the operating procedures for the facility; (iii) complaint monitoring forms; (iv) emergency response plans, procedures and monitoring forms; (v) monitoring forms for all monitoring activities identified above; (vi) vehicle maintenance and inspection report forms.

Biomedical waste biomedical waste treatment facilities are commonly located on the property of a hospital.

#### Design Standards

1. *General Design Considerations.* Biomedical waste biomedical waste treatment facilities should be housed in weatherproof and hurricane-proof buildings with full access to electrical and water services compatible with the requirements of the biomedical waste treatment facilities. The floor should be constructed of concrete slab. Specific criteria for general building requirements should be developed with consideration of local construction requirements for manufacturing facilities.
2. *Performance Standards.* The design of a biomedical waste biomedical waste treatment facilities should ensure that risks to human health and the environment are minimised. The effective operation of a biomedical waste biomedical waste treatment facilities is a function of:
  1. The operating temperature of the biomedical waste treatment facilities.
  2. The residence time of the waste and waste gases in the biomedical waste treatment facilities combustion chamber(s).
  3. The oxygen level in the equipment
  4. The combustion control system.
  5. Stack design, including pollution control equipment.

Different system designs can result in varying criteria associated with each of these parameters, but each design may be environmentally acceptable. All proponents should be required to supply information on these parameters to the Ministry of Health, and should also be required to provide full technical details on these matters regarding at least one facility similar in design and throughput to the one proposed. This information should be accompanied by the name and contact coordinates for the regulatory authority in which the referenced equipment are operational.

All biomedical waste biomedical waste treatment facilities should be required to meet the performance specification identified in Table D.2. The proponent should be required to demonstrate that a proposed biomedical waste biomedical waste treatment facilities will meet these performance criteria.

3. *Storage of waste.* Storage areas should be included in the design of biomedical waste incineration facilities. Storage areas should be equipped with locks and should be clearly labelled with the internationally-recognized biohazard symbol. Designs should provide for biomedical wastes to be stored at 4°C or colder. Entrance to the storage room should be designed to provide easy passage into and out of the storage room for the equipment that will be used to transport wastes within the biomedical waste treatment facilities building. It should not be necessary to travel outside in transporting the wastes from the storage room to the medical waste treatment equipment.
4. *Storm water management.* Storm water should be drained from the site of the biomedical waste equipment, and should not be permitted entry into the structures housing the equipment. Storm water should be discharged into the drainage system serving the area in which the equipment is located
5. *Access roads.* Access to the biomedical waste biomedical waste treatment facilities should be by all weather road designed and constructed to carry heavy-duty vehicles. Crossings of watercourses should be by culvert or by single-span structures; structures should not be built in watercourses. Watercourse crossings should be designed to withstand flood conditions (once in 10 year storms).
6. *Facility closure.* Closure plans should be developed as a component of facility design. These plans should specify the actions that will be taken to close the facility in such a way as to ensure that negative environmental and social impacts associated with the closure phase and beyond are adequately mitigated.

#### Operating Standards

1. *Acceptable waste types.* Only wastes for which a medical waste treatment equipment is designed should be accepted at the treatment site. All haulers bringing wastes to the site should be registered with the equipment operator, as should all generators of biomedical waste to be treated at the site. No waste should be accepted at the biomedical waste treatment facilities unless: (i) the hauler of the waste is registered with the biomedical waste treatment facilities operator and has a valid permit for hauling biomedical wastes; (ii) the source of waste generator is registered with the biomedical waste treatment facilities operator; and (iii) the waste is packaged as required by the biomedical waste transportation guidelines contained in this document or as those guidelines are amended by the regulatory authority.

In the event that either (i) or (ii) are contravened, the waste should be accepted only following verification that the waste is biomedical in nature. In the event (iii) is contravened, the driver should be required to return the waste to the generator to package the materials correctly. In all cases, contravention of these requirements should be reported to the Ministry of Health.

2. *Site security* No person should be allowed to enter the medical waste treatment building unless they are a duly authorized employee working or with business at the biomedical waste treatment facilities, a person who wishes to deposit waste, or other person with the written permission of the senior operational officer of the biomedical waste treatment facilities to enter the site. Any individual permitted entry who is not an employee at the site or in the business of depositing waste should be accompanied on-site by a site employee for the purpose of ensuring the safety of the individual while on-site. Any individual on-site without authority should be requested to leave unless they have legitimate business at the site; the assistance of the police should be requested if the individual is uncooperative.
3. *Access roads.* Access roads should be maintained in good year round repair suitable for use by heavy vehicles. Ditches should be kept free of debris.
4. *Site facilities.* All site structures should be maintained in good repair. All signs should be maintained in good repair and should be clearly and easily legible.
5. *Equipment.* Site equipment should be maintained in a state of good working order. Maintenance schedules should be adhered to, no unauthorized use - on-site or off-site - of equipment should be entertained, and necessary repairs should be promptly undertaken by qualified staff. Equipment should be securely stored in a weatherproof building.
6. *Storage and handling of wastes.* All biomedical wastes should be incinerated at the first opportunity. The maximum period of storage of biomedical waste (time in storage at point of generation plus time in transportation plus time in storage point of disposal) should not exceed 4 days. All storage must occur in a specially designated storage room or refrigerator at 4°C or cooler and wastes must be contained in containers meeting the requirements of these guidelines. A tracking system should be introduced such that all containers of waste entering the biomedical waste treatment facilities facility are recorded and tagged so as to identify the day by which the waste must be incinerated; a management system for handling the wastes should be developed that ensures that all wastes are incinerated within 4 days from the date of generation. At no point should wastes be exposed to the air. The storage room should remain locked unless wastes are being brought into or out of the room.

In the event of an emergency in which the incineration of wastes within 4 days is not possible or if it is not possible to maintain a maximum temperature of 4°C in the storage room, biomedical wastes should be hauled to a landfill and should be immediately deep-buried at a depth of at least 6 feet.

7. *Odour, Vector and Vermin Control.* The method of transporting and storing biomedical wastes and the priority on immediate disposal of wastes should ensure that no odour; vector or vermin problems arise. In the event of odour problems, the source and cause of the odour should be determined immediately and steps should be taken to correct the situation. In the event of vector or vermin problems, the cause of the problems should be immediately identified and corrected and a pest control expert should be retained to rid the facility of vectors and/or vermin.
8. *Worker health and safety.* Protective clothing to be worn at the site should include hearing protection in the vicinity of the biomedical waste treatment facilities, hard hats, gloves, safety glasses or goggles and steel-capped safety boots. This equipment should be issued to employees and it should be a condition of employment that it is worn during working hours.

All local occupational health and safety requirements should be observed. In addition, to the extent they are not explicitly covered by such requirements, the following should be undertaken: (i) rejection of all prohibited wastes from disposal; (ii) visual inspection of all loads of waste on an “as-delivered” basis and separation of any suspicious wastes of unknown origin; (iii) use of safety cones and signage to clearly direct traffic movements; (iv) ensure that no loitering takes place at following delivery of waste; (v) ensure that only those actively unloading waste leave their vehicle and then only for the purpose of unloading the waste.

Equipment should be inspected for visible signs of wear and tear according to a schedule provided by the supplier. If there is evidence of wear and tear that may compromise the safety of the equipment, the problems should be documented, reported and the equipment repaired before use. Mobile equipment should travel slowly, not normally exceeding 5 mph. All mobile equipment should be fitted with a back-up warning signal and strobe light for automatic use when proceeding in reverse. No equipment should be used that has not been maintained according to its maintenance schedule.

9. *Emergency Response.* The operator will maintain fire-extinguishing capacity sufficient to extinguish small fires, and will activate that capacity as necessary. A detailed contingency plan will be prepared by the operator in the event of: (i) a major fire; (ii) failure to maintain a maximum temperature of 4°C in the storage room; (iii) failure to incinerate biomedical waste within 4 days of generation of the waste; (iv) failure of the biomedical waste treatment facilities to perform to its operational or environmental specifications; and (v) a natural disaster. The contingency plan will be filed with the Ministry of Health and the national disaster preparedness (or equivalent) office.

Spills of flammable, hazardous or environmentally-contaminating materials will immediately be contained. The following absorbent materials will be used to clean up spills of liquids, all of which should be stored at the landfill in sufficient quantity to absorb a minimum of 200 litres of spilled: (i) oil spill pads for clean up of motor oil; (ii) soda ash or lime for clean up of acids; (iii) boric acid crystals for clean up of caustic spills; (iv) sorball, vermiculite, peat moss or other similar absorbent material for other and general purpose spill clean up. Clean up materials contaminated with these substances should be managed as hazardous waste. All spills will be documented by the landfill manager regarding: (i) the material spilled; (ii) the cause of the spill; (iii) action taken to clean up the spill; and (iv) measures proposed to ensure similar circumstances do not arise in future to cause a spill. A copy of the spill report will be forwarded to the senior operating officer of the waste management operator.

10. *Complaints and monitoring.* All complaints received from the public will be noted and action taken in response to each complaint will be documented.

Conformance with the conditions of operation cited on the License to operate the landfill should be continually monitored to ensure compliance with License conditions. Deviations from the environmental performance standards established for the facility, particularly those addressing atmospheric pollutants, will be investigated promptly and appropriate action taken to correct the deviations.

11. *On-site documentation.* Copies of the following documentation should be retained on-site: (i) the License to operate the facility; (ii) the operating procedures for the facility; (iii) complaint monitoring forms; (iv) emergency response plans, procedures and monitoring forms; (v) monitoring forms for all monitoring activities identified above; (vi) vehicle maintenance and inspection report forms.

**STEAM STERILIZATION (AUTOCLAVING) FACILITIES**

Steam sterilization (or autoclaving) of bio-hazardous waste utilizes saturated steam within a pressure vessel at temperatures sufficient to kill infectious agents present in the waste. Disinfection of the waste occurs primarily from steam penetration and steam generation within the water based organisms. The following siting, design and operating standards are developed for steam sterilization (autoclaving) of bio-hazardous waste. These standards are not necessarily appropriate for steam sterilization units intended to treat municipal non-hazardous refuse or industrial hazardous wastes of a non-biomedical nature; separate and additional standards may be necessary to treat these types of waste.

Siting Standards

Steam sterilization (autoclave) facilities may be sited in accordance with practices for other industrial buildings. The siting of a steam sterilization facility in reasonable proximity to a landfill site will result in minimising costs associated with the transport of treated waste from the facility to the landfill. It can however be located on the property of a hospital.

Design Standards

1. *General Design Considerations.* The facility should house a treatment centre; an area for unloading/loading of waste receptacles from vehicles; a storage area for waste receptacles prior to processing; an area for the washing of emptied receptacles. The steam sterilization unit (autoclave unit) should be housed in weather-proof, hurricane-proof and earthquake-proof buildings with full access to electrical and water services compatible with the requirements of the steam sterilizer (autoclave). The floor should be constructed of concrete slab to withstand equipment, containers and vehicles. The facility should be designed such that temperature is minimized by natural ventilation with screening to exclude insects. Design and construction should also minimize routine maintenance costs. The steam sterilization facility should comply with all relevant legislation and specific criteria for general building requirements and should be developed with consideration of local construction requirements for manufacturing facilities.
2. *Performance Standards.* The design of a steam sterilization unit (autoclave unit) should ensure that risks to human health and the environment are minimised. The plant should allow for minimal handling of waste during collection, treatment, and disposal. Because treatment of bio-hazardous waste is time and temperature dependent, the steam sterilization (autoclave) unit should operate at a temperature no less than 121 degrees and a pressure of 15 pounds per square inch (psi) for a minimum residence time of 30 minutes. Treatment should achieve a 6-log kill of viable bacterial spores (*Bacillus stearothermophilus* or *Bacillus subtilis*). A shredding system

prior to treatment, or during the sterilization process should be established to achieve 6 log kill for some dense waste streams (e.g anatomical). The sterilization process should reduce the original volume of the waste to a minimum of 80%. Waste should not be generally recognisable and should be suitable for transfer as solid waste for final landfill disposal. A shredding/maceration process during or after treatment would achieve this. The steam sterilization system should employ an automated loading system and computerised controls for time, temperature, and pressure. A printout should be available for each and every cycle undertaken and should include the following data as a minimum: date and time, duration of cycle, temperature/pressure achieved. Facilities for quality control testing by means of spore strips or equivalent methods and use of parametric monitoring should be available. A standard spare part inventory should be available.

3. *Storage of waste.* Storage areas should be included in the design of steam sterilization facilities. Storage areas should be equipped with locks and should be clearly labelled with the internationally-recognized biohazard symbol. Designs should provide for biomedical wastes to be stored at 4°C or colder. Entrance to the storage room should be designed to provide easy passage into and out of the storage room for the equipment that will be used to transport wastes within the steam sterilization facility. It should not be necessary to travel outside in transporting the wastes from the storage room to the steam sterilization unit.
4. *Storm water management.* Storm water should be drained from the site of the steam sterilization facility, and should not be permitted entry into the structures housing the steam sterilization unit. Storm water should be discharged into the drainage system serving the area in which the steam sterilization unit is located.
5. *Access roads.* Access to the steam sterilization facility should be by all weather road designed and constructed to carry heavy-duty vehicles. Crossings of watercourses should be by culvert or by single-span structures; structures should not be built in watercourses. Watercourse crossings should be designed to withstand flood conditions (once in 10 year storms).
6. *Facility closure.* Closure plans should be developed as a component of facility design. These plans should specify the actions that will be taken to close the facility in such a way as to ensure that negative environmental and social impacts associated with the closure phase and beyond are adequately mitigated.

Operating Standards

1. *Acceptable waste types.* Only wastes for which a steam sterilization unit is designed should be accepted at the steam sterilization facility. All haulers bringing wastes to the steam sterilization facility, as well as generators of biomedical waste to be treated at the site should be registered with the operator of the unit. No waste should be accepted at the steam sterilization facility unless: (i) the hauler of the waste is registered with the operator of the facility and has a valid permit for hauling biomedical wastes; (ii) the source of waste generator is registered with the operator of the facility; and (iii) the waste is packaged as required by the biomedical waste transportation guidelines contained in this document or as those guidelines are amended by the regulatory authority.

In the event that either (i) or (ii) are contravened, the waste should be accepted only following verification that the waste is biomedical in nature. In the event (iii) is contravened, the driver should be required to return the waste to the generator to package the materials correctly. In all cases, contravention of these requirements should be reported to the Ministry of Health.

2. *Site security* No person should be allowed to enter the steam sterilization building unless they are a duly authorized employee working or with business at the facility, a person who wishes to deposit waste, or other person with the written permission of the senior operational officer of the facility to enter the site. Any individual permitted entry who is not an employee at the site or in the business of depositing waste should be accompanied on site by a site employee for the purpose of ensuring the safety of the individual while on site. Any individual on site without authority should be requested to leave unless they have legitimate business at the site. The assistance of the police should be requested if the individual is uncooperative.
3. *Access roads.* Access roads should be maintained in good condition year round and be suitable for use by heavy vehicles. Ditches should be kept free of debris.
4. *Site facilities.* All site structures should be maintained in good repair. All signs should be maintained in good repair and should be clearly and easily legible.
5. *Equipment.* Site equipment should be maintained in a state of good working order. Maintenance schedules should be adhered to, no unauthorized use - on-site or off-site - of equipment should be entertained, and necessary repairs should be promptly undertaken by qualified staff. Equipment should be securely stored in a weatherproof building.



6. *Storage and handling of wastes.* All biomedical wastes should be treated at the first opportunity. The maximum period of storage of biomedical waste (time in storage at point of generation plus time in transportation plus time in storage point of disposal) should not exceed 4 days. All storage must occur in a specially designated storage room or refrigerator at 4°C or cooler and wastes must be contained in containers meeting the requirements of these guidelines. A tracking system should be introduced such that all containers of waste entering the steam sterilization (autoclave) facility are recorded and tagged so as to identify the day by which the waste must be treated; a management system for handling the wastes should be developed that ensures that all wastes are autoclaved within 4 days from the date of generation. At no point should wastes be exposed to the air. The storage room should remain locked unless wastes are being brought into or out of the room.

In the event of an emergency in which the autoclave of wastes within 4 days is not possible or if it is not possible to maintain a maximum temperature of 4°C in the storage room, biomedical wastes should be hauled to a landfill and should be immediately deep-buried at a depth of at least 6 feet.

7. *Odour, Vector and Vermin Control.* The method of transporting and storing biomedical wastes and the priority on immediate disposal of wastes should ensure that no odour; vector or vermin problems arise. In the event of odour problems, the source and cause of the odour should be determined immediately and steps should be taken to correct the situation. In the event of vector or vermin problems, the cause of the problems should be immediately identified and corrected and a pest control expert should be retained to rid the facility of vectors and/or vermin.
8. *Worker health and safety.* Protective clothing to be worn at the site should include hearing protection in the vicinity of the biomedical waste treatment facilities, hard hats, gloves, safety glasses or goggles and steel-capped safety boots. This equipment should be issued to employees and it should be a condition of employment that it is worn during working hours.

All local occupational health and safety requirements should be observed. In addition, to the extent they are not explicitly covered by such requirements, the following should be undertaken: (i) rejection of all prohibited wastes from disposal; (ii) visual inspection of all loads of waste on an "as-delivered" basis and separation of any suspicious wastes of unknown origin; (iii) use of safety cones and signage to clearly direct traffic movements; (iv) ensure that no loitering takes place at following delivery of waste; (v) ensure that only those actively unloading waste leave their vehicle and then only for the purpose of unloading the waste.

Equipment should be inspected for visible signs of wear and tear according to a schedule provided by the supplier. If there is evidence of wear and tear that may compromise the safety of the equipment, the problems should be documented, reported and the equipment repaired before use. Mobile equipment should travel slowly, not normally exceeding 5 mph. All mobile equipment should be fitted with a back-up warning signal and strobe light for automatic use when proceeding in reverse. No equipment should be used that has not been maintained according to its maintenance schedule.

9. *Emergency Response.* The operator will maintain fire-extinguishing capacity sufficient to extinguish small fires, and will activate that capacity as necessary. A detailed contingency plan will be prepared by the operator in the event of: (i) a major fire; (ii) failure to maintain a maximum temperature of 4°C in the storage room; (iii) failure to treat biomedical waste within 4 days of generation of the waste; (iv) failure of the steam sterilization/autoclave unit to perform to its operational or environmental specifications; and (v) a natural disaster. The contingency plan will be filed with the Ministry of Health and the National Emergency Management (or equivalent) Office.

All spills will be documented by the manager of the facility regarding: (i) the material spilled; (ii) the cause of the spill; (iii) action taken to clean up the spill; and (iv) measures proposed to ensure similar circumstances do not arise in future to cause a spill. A copy of the spill report should be forwarded to the senior General Manager of the Solid Waste Management Authority.

10. *Complaints and monitoring.* All complaints received from the public will be noted and action taken in response to each complaint will be documented.

Conformance with the conditions of operation cited on the License to operate the landfill should be continually monitored to ensure compliance with License conditions. Deviations from the environmental performance standards established for the facility, particularly those addressing atmospheric pollutants, will be investigated promptly and appropriate action taken to correct the deviations.

11. *On-site documentation.* Copies of the following documentation should be retained on-site: (i) the License to operate the facility; (ii) the operating procedures for the facility; (iii) complaint monitoring forms; (iv) emergency response plans, procedures and monitoring forms; (v) monitoring forms for all monitoring activities identified above; (vi) vehicle maintenance and inspection report forms.
12. The facility should comply with either or European Union (EU), World Health Organisation (WHO)/United States (US) recommendations and directives for safe Hazardous Health-Care Waste (HHCW) collection and disposal. The facility should carry Conformite Europeenne (CE) approval

and/or Underwriter's Laboratory (UL) registration for applicable components and fully comply with the provisions of Health Technical Memorandum 2075 of the United Kingdom and/or the reports of the State and territorial Association for Alternative Treatment Technologies (STAATT) of the US.

### **INCINERATION FACILITIES**

Incineration is the process by which waste materials are oxidized (or combusted) at high temperatures in the presence of oxygen. The design of a waste incinerator depends on the type of waste which is to be treated by this facility. The waste incinerator requires sufficient residence time to reduce the harmful potential of the waste being treated and to convert combustible materials into non-combustible residue or ash.

#### Siting Standards

The principle potential negative environmental impacts associated with waste incinerators are: (i) human health impacts associated with elevated levels of stack emissions; and (ii) human health and environmental impacts associated with inadequate management of incinerator ash.

Waste incinerators may be sited in accordance with practices for other industrial buildings, except that in addition to criteria associated with other industrial facilities waste incinerators should be located in areas with good air circulation. Although waste incinerators should be operated under strict operating and emission control criteria, the potential impacts of a waste incinerator under unanticipated upset conditions will be minimised to the extent that general air circulation assists in dissipating contaminants.

Incinerator ash should be buried in a landfill site. The siting of waste incinerators in reasonable proximity to a landfill site will result in minimising costs associated with the transport of ash from the incinerator to the landfill.

#### Design Standards

1. *General Design Considerations.* Waste incinerators should be housed in weatherproof and hurricane-proof buildings with full access to electrical and water services compatible with the requirements of the incinerator. The floor should be constructed of concrete slab. Specific criteria for general building requirements should be developed with consideration of local construction requirements for manufacturing facilities.
2. *Operational Requirements.* The design of a waste incinerator should ensure that risks to human health and the environment are minimised. The effective operation of a waste incinerator is a function of:
  1. The operating temperature of the incinerator.

2. The residence time of the waste and waste gases in the incinerator combustion chamber(s).
3. The oxygen level in the incinerator.
4. The combustion control system.
5. Stack design, including pollution control equipment.

Different system designs can result in varying criteria associated with each of these parameters, but each design may be environmentally acceptable. All proponents should be required to supply the following information to the Ministry of Physical Development, Environment and Housing and should also be required to provide full technical details on these matters regarding at least one facility similar in design and throughput to the one proposed. This information should be accompanied by the name and contact coordinates for the regulatory authority in which the referenced incinerators are operational.

The persons requiring to construct or install an incinerator or thermal treatment facility, shall submit the following to the Ministry of Physical Development, Environment and Housing:

a detailed engineering description of the incinerator or thermal treatment facility including the following information:

- (i) manufacturer's name and model number (if available);
- (ii) type of incinerator or thermal treatment facility;
- (iii) internal dimension of the incinerator, or thermal treatment facility including the cross sectional area of the process chamber;
- (iv) description of any auxiliary fuel system including fuel type and feed rate;
- (v) capacity of air supply and exhaust systems;
- (vi) description of the automatic waste feed cutoff system or systems;
- (vii) any stack gas monitoring and pollution control equipment;
- (viii) nozzle and burner design if the thermal treatment facility is an incinerator;
- (ix) construction materials;
- (x) location and description of temperature, pressure and flow sensing and control devices,

a prediction of the maximum ambient ground level concentration of emissions from the facility by means of an approved atmospheric dispersion model, and  
 (2) Before beginning operation of an incinerator or thermal treatment facility, the owner shall

- (a) conduct a demonstration trial in an approved manner to demonstrate the effectiveness of the facility to treat or destroy special waste, and shall conduct the trial for a sufficient time under normal operating conditions to obtain
- (i) a qualitative and quantitative description of the physical, chemical and biological properties of
- (A) the special waste to be incinerated or thermally treated including all principal organic hazardous constituents (POHCs),
- (B) any air emissions including all POHCs, products of incomplete combustion (PICs) and parameters listed in Schedule 2,
- (C) any liquid effluent discharges including all POHCs, PICs and parameters listed in Schedule 1.2, and
- (D) any solid residues including all POHCs, PICs and trace metals listed in Schedule 2;
- (ii) a determination of the destruction and removal efficiency (DRE), using Equation 1:

$$DRE = \frac{W_{in} - W_{out}}{W_{in}} \times 100\% \quad \text{Equation 1}$$

where =

$W_{in}$  = Mass feed rate of one POHC in the waste feed into the incinerator or thermal treatment facility,

$W_{out}$  = Mass emission rate of the same POHC present in the exhaust emissions,

- (iii) a determination of the combustion efficiency (CE), using Equation 2:

$$CE = \frac{CO_2}{CO_2 + CO} \times 100\% \quad \text{Equation 2}$$

where  $CO_2$  = Concentration of carbon dioxide in exhaust emissions,

$CO$  = Concentration of carbon monoxide in the exhaust emissions,

- (iv) a determination of operating conditions including but not limited to
- (A) the temperature in the combustion zone or the zone of active thermal treatment,

(B) the residence time of gases in the combustion zone or the zone of active thermal treatment, and

(C) the concentration of excess oxygen in the exhaust emissions

whereby the DRE in Equation 1 was determined, and

(v) a determination of specific

(A) meteorological conditions, and

(B) ambient concentrations of POHCs, PICs and other contaminants as approved, and

(b) submit a report with the information described in paragraph (a) to a manager, the district director or the director.

(3) The requirement in subsection (2) (a) (iii) does not apply to thermal treatment facilities which generate CO<sub>2</sub> from sources other than the combustion process.

(4) The owner of an incinerator or thermal treatment facility shall

(a) provide an alarm system and an automatic cutoff system to stop the special waste feed to the facility when operating conditions specified in the permit are not met,

(b) test the automatic cutoff system weekly, and

(c) report any malfunction of the automatic cutoff system to the district director or the director within 24 hours after it occurs.

(5) The owner of an incinerator or thermal treatment facility shall inspect the facility and all associated equipment such as pumps, valves, conveyors, pipes, etc. daily for any leaks, spills, fugitive emissions and signs of tampering or malfunction.

(6) Any leaks, spills or fugitive emissions from any incinerator or thermal treatment facility shall be controlled by keeping the works sealed or by maintaining the internal pressure lower than the atmospheric pressure.

(7) The owner of an incinerator or thermal treatment facility shall continuously measure and record for inspection by an Authorized Officer under this Act:

(a) the temperature in the combustion zone or the zone of active thermal treatment,

(b) the waste feed rate,

(c) the gas flow rate at the exit from the combustion zone or the zone of active thermal treatment, and

(d) carbon monoxide, carbon dioxide and oxygen concentrations in the exhaust gas.

(8) The owner of an incinerator or thermal treatment facility shall monitor any process emissions for approved parameters at approved intervals.

(9) A report of the emissions monitoring including methods and results shall be submitted to the Minister of Environment within 60 days after completion of the emissions monitoring referred to in subsection (8).

(10) The owner of an incinerator or thermal treatment facility shall monitor the ambient air quality and meteorological conditions using approved methods.

(11) A report of the ambient air quality monitoring referred to subsection (10) shall be submitted to the Minister of Environment on an annual basis.

*Performance Standards*

(1) The owner of an incinerator or thermal treatment facility shall ensure that during operation

(a) the DRE (Equation 1) of the facility is equal to or greater than that specified in Table 1,

**Table 1**

<b>Parameter</b>	<b>DRE Standards</b>
Principal Organic Hazardous Constituents (POHCs)	99.99%
Polychlorinated biphenyls (PCBs)	99.9999%
Polychlorinated dibenzofurans	99.9999%
Polychlorinated dibenzo-p-dioxins	99.9999%

(b) the operating conditions are maintained at levels shown by the demonstration trial referred to in operational requirements to be necessary to meet the DRE criteria in Table 1,

(c) the CE (Equation 2) of an incinerator is equal to or greater than 99.9%,

(d) the exhaust emissions meet the emission standards as specified in Schedule 8, and

(e) any discharge of liquid effluent to the environment or to any system of waste disposal operated by a municipality or other public authority which results from the operation of an incinerator or thermal treatment facility meets the effluent standards prescribed in Schedule 9.

(2) The owner of an incinerator or thermal treatment facility shall not allow solid residue to be discharged from it unless the owner demonstrates to the satisfaction of the Minister of Physical Development, Environment and Housing in accordance with test protocols or methods approved by the Director of

Environment that the residue no longer poses a hazard to human health or to the environment and that the residue is suitable for

- (i) disposal to a landfill authorized by a permit,
- (ii) some other purpose under an approved management option.

(3) Where an owner has demonstrated to the Minister in accordance with subsection (2) that a residue no longer poses a hazard to human health or to the environment, the Minister may, authorize disposal of the residue to a landfill .

3. *Storage of waste.* Storage areas should be included in the design of waste incineration facilities. Storage areas should be equipped with locks and should be clearly labelled with the internationally-recognized hazard symbols. Entrance to the storage room should be designed to provide easy passage into and out of the storage room for the equipment that will be used to transport wastes within the incinerator building. It should not be necessary to travel outside in transporting the wastes from the storage room to the incinerator.
4. *Storm water management.* Storm water should be drained from the site of the incinerator, and should not be permitted entry into the structures housing the incinerator. Storm water should be discharged into the drainage system serving the area in which the incinerator is located
5. *Access roads.* Access to the incinerator should be by all weather road designed and constructed to carry heavy-duty vehicles. Crossings of watercourses should be by culvert or by single-span structures; structures should not be built in watercourses. Watercourse crossings should be designed to withstand flood conditions (once in 10 year storms).
6. *Facility closure.* Closure plans should be developed as a component of facility design. These plans should specify the actions that will be taken to close the facility in such a way as to ensure that negative environmental and social impacts associated with the closure phase and beyond are adequately mitigated.

#### Operating Standards

1. *Acceptable waste types.* Only wastes for which an incinerator is designed should be accepted at the incinerator site. All haulers bringing wastes to the incinerator should be registered with the incinerator operator, as should all generators of waste to be treated at the site. No waste should be accepted at the incinerator unless: (i) the hauler of the waste is registered with the incinerator operator and has a valid permit for hauling biomedical wastes; (ii) the source of waste generator is registered with the incinerator operator; and (iii) the waste is packaged as required by the biomedical



waste transportation guidelines contained in this document or as those guidelines are amended by the regulatory authority.

In the event that either (i) or (ii) are contravened, the waste should be accepted only following verification that the waste can be treated at the facility. In the event (iii) is contravened, the driver should be required to return the waste to the generator to package the materials correctly. In all cases, contravention of these requirements should be reported to the Ministry of Physical Development, Environment and Housing.

2. *Site security* No person should be allowed to enter the incinerator building unless they are a duly authorized employee working or with business at the incinerator, a person who wishes to deposit waste, or other person with the written permission of the senior operational officer of the incinerator to enter the site. Any individual permitted entry who is not an employee at the site or in the business of depositing waste should be accompanied on-site by a site employee for the purpose of ensuring the safety of the individual while on-site. Any individual on-site without authority should be requested to leave unless they have legitimate business at the site; the assistance of the police should be requested if the individual is uncooperative.
3. *Access roads.* Access roads should be maintained in good year round repair suitable for use by heavy vehicles. Ditches should be kept free of debris.
4. *Site facilities.* All site structures should be maintained in good repair. All signs should be maintained in good repair and should be clearly and easily legible.
5. *Equipment.* Site equipment should be maintained in a state of good working order. Maintenance schedules should be adhered to, no unauthorized use - on-site or off-site - of equipment should be entertained, and necessary repairs should be promptly undertaken by qualified staff. Equipment should be securely stored in a weatherproof building.
6. *Storage and handling of wastes.* All wastes should be incinerated at the first opportunity. A tracking system should be introduced such that all containers of waste entering the incinerator facility are recorded and tagged so as to identify the day by which the waste must be incinerated; a management system for handling the wastes should be developed that ensures that all wastes are incinerated within as soon as possible. At no point should wastes be exposed to the air. The storage room should remain locked unless wastes are being brought into or out of the room.

In the event of an emergency in which the incineration of wastes is not possible within a reasonable time frame the material should be adequately contained so as to avoid harm to health and the environment.

7. *Odour, Vector and Vermin Control.* The method of transporting and storing the material should ensure that no odour; vector or vermin problems arise. In the event of odour problems, the source and cause of the odour should be determined immediately and steps should be taken to correct the situation. In the event of vector or vermin problems, the cause of the problems should be immediately identified and corrected and a pest control expert should be retained to rid the facility of vectors and/or vermin.
8. *Worker health and safety.* Protective clothing to be worn at the site should include hearing protection in the vicinity of the incinerator, hard hats, gloves, safety glasses or goggles and steel-capped safety boots. This equipment should be issued to employees and it should be a condition of employment that it is worn during working hours.

All local occupational health and safety requirements should be observed. In addition, to the extent they are not explicitly covered by such requirements, the following should be undertaken: (i) rejection of all prohibited wastes from disposal; (ii) visual inspection of all loads of waste on an "as-delivered" basis and separation of any suspicious wastes of unknown origin; (iii) use of safety cones and signage to clearly direct traffic movements; (iv) ensure that no loitering takes place at following delivery of waste; (v) ensure that only those actively unloading waste leave their vehicle and then only for the purpose of unloading the waste.

Equipment should be inspected for visible signs of wear and tear according to a schedule provided by the supplier. If there is evidence of wear and tear that may compromise the safety of the equipment, the problems should be documented, reported and the equipment repaired before use. Mobile equipment should travel slowly, not normally exceeding 5 mph. All mobile equipment should be fitted with a back-up warning signal and strobe light for automatic use when proceeding in reverse. No equipment should be used that has not been maintained according to its maintenance schedule.

9. *Emergency Response.* The operator will maintain fire-extinguishing capacity sufficient to extinguish small fires, and will activate that capacity as necessary. A detailed contingency plan will be prepared by the operator in the event of: (i) a major fire; (ii) failure of the incinerator to perform to its operational or environmental specifications; and (iii) a natural disaster. The contingency plan will be filed with the Ministry of Physical Development Environment and Housing Environment and the National Emergency Management Office.

Spills of flammable, hazardous or environmentally-contaminating materials will immediately be contained. The following absorbent materials will be used to clean up spills of liquids, all of which should be stored at the landfill in sufficient quantity to absorb a minimum of 200 litres of spilled: (i) oil spill pads for clean up of motor oil; (ii) soda ash or lime for clean up of acids; (iii) boric acid crystals for clean up of caustic spills; (iv) sorball, vermiculite, peat moss or other similar absorbent material for other and general purpose spill clean up. Clean up materials contaminated with these substances should be managed as hazardous waste. All spills will be documented by the facility manager regarding: (i) the material spilled; (ii) the cause of the spill; (iii) action taken to clean up the spill; and (iv) measures proposed to ensure similar circumstances do not arise in future to cause a spill. A copy of the spill report will be forwarded to the Ministry of Physical Development Environment and Housing.

10. *Complaints and monitoring.* All complaints received from the public will be noted and action taken in response to each complaint will be documented.

Conformance with the conditions of operation cited on the licence to operate the landfill should be continually monitored to ensure compliance with licence conditions. Deviations from the environmental performance standards established for the facility, particularly those addressing atmospheric pollutants, will be investigated promptly by the operator and appropriate action taken to correct the deviations.

11. *On-site documentation.* Copies of the following documentation should be retained on-site: (i) the licence to operate the facility; (ii) the operating procedures for the facility; (iii) complaint monitoring forms; (iv) emergency response plans, procedures and monitoring forms; (v) monitoring forms for all monitoring activities identified above; (vi) vehicle maintenance and inspection report forms.

## **WASTEHAULAGESYSTEMS**

This section provides guidelines for the storage and haulage of non-hazardous solid wastes and biomedical waste. The management of other types of waste may reasonably require different storage and haulage systems to ensure that human health and the environment are protected from the potential impacts of the wastes.

### Storage of Non-Hazardous Solid Waste

1. *Household Waste.* Non-hazardous solid waste should be stored in such a way as to prevent the blowing of waste, the escape of odour and the disturbance of the waste by vermin, dogs or other animals. Typically, waste should be placed in a container that meets these requirements and,

in addition, is of such size and weight when full that it can be readily handled within the context of the waste management system.

Plastic bags and rigid plastic or metal containers are commonly used to store household waste. Cardboard boxes and other types of container may also be suitable if the waste inside them is secured. Where rigid, reusable containers are used (e.g. "garbage cans") householders should be encouraged to place their wastes in a disposable bag before placing the waste in the container. This will help keep the inside of the container clean and discourage odour. Some types of household waste are not amenable to being placed in a bag or a container, for example brush. Brush may be bundled and tied in such a way as to prevent the brush from becoming a nuisance.

Wherever possible, initiatives should be undertaken to require or encourage, as appropriate, householders to keep vegetative waste out of the waste they place for collection. The generator can compost vegetative wastes of all descriptions or the local community to produce compost, a useful soil amendment that will enhance agricultural and flower production. Keeping these wastes out of the collection system will reduce odour and vermin problems in waste collection systems, reduce waste collection costs, extend the life of landfills and reduce the quantity of leachate generated in landfills.

2. *Industrial, Commercial and Institutional (IC&I) Waste.* It is the responsibility of IC&I generators to make their own arrangements for the management of the wastes they generate. Part of this responsibility involves ensuring that the containers that an IC&I generator uses meet the requirements set out in Point (1) of this section, while at the same time being acceptable to the waste hauler.

#### Storage of Biomedical Waste

1. Biomedical waste typically comprises less than half the total waste generated by a biomedical waste generating facility; the balance is typically non-hazardous solid waste. Accordingly, costs associated with biomedical waste management will be minimised to the extent that biomedical waste is segregated from non-hazardous and other wastes. However, it is very important that this segregation does not result in disposal of biomedical waste in the non-hazardous solid waste stream.
2. Biomedical waste should be stored in containers appropriate to the waste they contain. Reusable containers should be required to be constructed of rigid plastic or metal, and able to withstand cleansers. All waste except sharps that is placed within a reusable container should be bagged in a heavy-duty disposable plastic bag that will not puncture under normal use. Sharps should be placed in a disposable rigid container. Reusable containers should be cleaned with an approved cleanser at least once per week.

3. Biomedical waste may also be placed in a disposable container. The only such containers that are acceptable for all biomedical wastes except sharps are heavy-duty plastic bags that will not puncture under normal use.
4. Sharps are defined to include needles, syringes, blades or laboratory glass used in any type of health care facility, doctors' office, veterinary clinic or similar place. Sharps have potential to not only cut a waste management system worker, but may also be contaminated and so contribute to the spread of disease. Waste sharps should be placed in a rigid disposable container that will not puncture or break. Waste sharps containers are commercially available and should be required to be used by all generators of these wastes.
5. Any biomedical waste that contains body fluids, bone, flesh or other body parts except hair should be stored in a room or other space refrigerated to a maximum of 4°C and should be disposed of within 4 days of generation. Vehicles hauling these wastes should maintain the wastes at this temperature (maximum) during transportation. Storage at the point of disposal should likewise not exceed this temperature. All biomedical wastes should be disposed of within 4 days of being generated.
6. All biomedical waste containers should be yellow, except biomedical waste containers that include body fluids, bone, flesh or other body parts except hair. Biomedical waste containers that contain body fluids, bone, flesh or other body parts except hair should be red. In all cases, the containers should be clearly labelled with the international biohazard symbol and should be tagged with a label that certifies the date on which the first waste entering the container was generated.

#### Waste Haulage

1. Personnel engaged in collecting and hauling wastes that have been placed in a container should be required to undergo training in the following as it relates to their job function and the wastes they collect and haul:
  - (i) Operation and basic maintenance of the vehicle.
  - (ii) Proper loading, unloading and vehicle cleaning procedures.
  - (iii) Relevant legislation and regulation.
  - (iv) The nature and characteristic of the waste they will handle and procedures and precautions to protect personal and community health.
  - (v) Emergency response procedures, including response to a spill or accident and use of emergency equipment.

In addition, drivers of waste haulage vehicles should be required to possess a License to operate the waste haulage vehicle issued by the relevant country entity and will be required to maintain the License in good standing.

2. All vehicles engaged in either the commercial haulage of waste or the haulage of waste generated by a commercial or institutional setting should be required to meet the following standards:
  - (i) Compliance with all local licensing and safety standards or requirements associated with the type, size and class of vehicle in question.
  - (ii) Storage of waste on the vehicle in such a way that it does not come in contact with a member of the public and cannot blow out of or otherwise fall from the vehicle.
  - (iii) All vehicles hauling commercially generated waste under contract should be equipped with functioning rear motion alarms and strobe lights, and fire extinguisher.
  - (iv) Biomedical waste should be placed in a locked compartment on a waste collection vehicle. On no account should biomedical waste be placed in the same vehicle compartment as non-hazardous solid waste, nor should it be compacted or otherwise mechanically compressed. Any biomedical waste containing body fluids, bone, flesh or other body parts except hair should be transported at a maximum temperature of 4°C.
  - (vi) The interior storage compartment of vehicles engaged in the commercial haulage of waste should be cleaned regularly (minimum two times per week). The exterior of such vehicles should be cleaned as necessary to maintain a clean and tidy image.(vii) The vehicle should be maintained according to the manufacturers' specifications and should meet the normal operating requirements of the country for that class of vehicle.
  - (viii) The permit to operate the vehicle for the purpose of waste haulage must be in the vehicle and readily available to the driver.
  - (ix) To have in force sufficient insurance coverage to provide for the clean up of spills that might occur.

**Table D.2****Atmospheric Emission Criteria Associated With Biomedical Waste  
Biomedical waste treatment facilities**

<b>Parameter</b>	<b>Maximum Emission</b>	<b>Monitoring Method</b>
Particulate Matter	50 mg/Rm <sup>3</sup>	In-situ monitoring - 4 hour rolling average
Hydrogen Chloride	75 mg/Rm <sup>3</sup>	Continuous emission monitor - 24 hour rolling average
Carbon Monoxide	57 mg/Rm <sup>3</sup>	Continuous emission monitor - 4 hour rolling average
Total polychlorinated dibenzo- <i>p</i> -dioxins and polychlorinated dibenzofurans	0.5 ng/Rm <sup>3</sup>	Toxic equivalency factor new international method, based on congener-specific analytical test data

**SCHEDULE 7**

(Section 2)

**Bodies comprising Public Authority**

1. Any local authority;
2. National Conservation Authority established under Act No. 16 of 1999;
3. St. Lucia Air & Seaports Authority established under the St. Lucia Air & Seaports Authority Act No. 10 of 1983;
4. Water & Sewerage Company established under the Water & Sewerage Company Act No. 13 of 1999;
5. Motor Vehicle and Traffic Authority established under the Motor Vehicle and Traffic Act No. 23 of 1988;
6. Forest, Soil and Water Conservation Authority established by an Act of Parliament;
7. The administering body of any cemetery;
8. Any other authority established by an Act of Parliament;
9. All other bodies or classes of bodies which may be from time to time declared by Minister published in the Gazette, to be public authorities for the purposes of this Act;
10. Any company, firm partnership or association.



**SCHEDULE 8**

(Section 23)

**Emission Standards for Thermal Treatment Facilities**

<b>Parameters</b>	<b>Maximum Concentration<sup>(1)</sup> (mg/m<sup>3</sup> unless otherwise indicated)</b>	<b>Averaging Period<sup>(2)</sup></b>	<b>Monitoring Method<sup>(3)</sup></b>
Carbon monoxide	55	4-hr RA	C
Hydrogen chloride	50	8-hr RA	C
Hydrogen fluoride	4	A	A
Nitrogen oxides (as NO <sub>2</sub> )	380	A	A
Opacity	5%	1-hr RA	C
Particulate matter	20	A	A
Sulphur dioxide	180	A	A
Total hydrocarbon (as methane)	32	A	A
Trace metals <sup>(4)</sup> :			
<b>Class I</b> (lead, antimony, copper, manganese, vanadium, zinc)	3.6	A	A
<b>Class II</b> (arsenic, chromium, cobalt, nickel, selenium, tellurium)	0.7	A	A
<b>Class III</b> (thallium, cadmium, mercury)	0.15	A	A

**NOTES:**

- (1) Concentrations are corrected to 11% oxygen and standard conditions of 20°C, 760 mm of mercury and dry basis.

- (2) Averaging period codes: RA means rolling average which is the moving time period over which the continuous monitoring data is averaged.
- A means as approved by a manager.
- (3) Monitoring method codes: C means continuous.
- A means as approved by the director.
- (4) The concentrations prescribed apply to each individual metal.

**SCHEDULE 9**

(Section 23)

**Effluent Standards for Special Waste Facilities**

<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>
<b>Parameter</b>	<b>Standard* for Discharges to the Environment or to Storm Sewers</b>	<b>Standard* for Discharges Directed to Municipal or Industrial Effluent Treatment Works</b>
Physical		
pH	6.5 to 8.5**	5.0 to 11.0**
Temperature	32°C	—
Total suspended solids	20	—
Toxicity (limit bioassay — 50% survival of Rainbow trout after 96 hours)	100% effluent	50% effluent
Inorganics		
Aluminum, dissolved	0.5	2.0
Ammonia, total (expressed as nitrogen)	2.0	—
Antimony, dissolved	0.25	0.5
Arsenic, dissolved	0.1	0.3
Barium, dissolved	1.0	2.5
Boron, dissolved	10.0	15.0
Cadmium, dissolved	0.05	1.0
Chromium, dissolved (hexavalent)	0.1	0.2
Chromium, total	0.5	1.0

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	Cobalt, dissolved	0.1	0.3
	Copper, dissolved	0.1	0.3
	Cyanide (weak acid dissociable)	0.1	0.2
	Fluoride, dissolved	15	18
	Lead, dissolved	0.1	0.3
	Manganese, dissolved	0.5	1.0
	Mercury, total	0.001	0.01
	Molybdenum, dissolved	0.5	1.0
	Nickel, dissolved	0.5	1.0
	Selenium, dissolved	0.05	0.1
	Tin, dissolved	0.5	1.0
	Zinc, dissolved	0.2	0.5
Organics			
	5 day Biochemical oxygen demand (BOD)	20	—
	Dioxin TEQ	15 pg/l	pg/l
	Oil	10	60
	Phenol	0.2	0.5
	Polychlorinated biphenyls, total	0.005	0.005
	Total chlorinated phenol	0.006	0.05
	Total organic halogens (as Cl)	1.0	1.0

\* Maximum concentration or range in (mg/l) unless otherwise specified. pg/l is the abbreviation for picograms per litre.

\*\* pH units are the negative log of the hydrogen ion concentration.

Note: Local municipal requirements may be more restrictive.

Passed in the House of Assembly this 30th day of March, 2004.

BADEN J. ALLAIN,  
*Speaker of the House of Assembly.*

Passed in the Senate this 14th day of April, 2004.

HILFORD DETERVILLE,  
*President of the Senate.*