LANDFILL ACT, 2002

Principal Act

Act. No. 2002-18  
**Commencement** 20.2.2003  
**Assent** 16.12.2002

<table>
<thead>
<tr>
<th>Amending enactments</th>
<th>Relevant current provisions</th>
<th>Commencement date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Act. 2007-35</td>
<td>ss. 6(3), (6) &amp; (7), 11(8) &amp; Sch. 4</td>
<td>5.7.2007</td>
</tr>
<tr>
<td>LN. 2011/214</td>
<td>ss. 2(1) &amp; (2B), 5(1)(f), (fa), (2A), (2B), (2C) &amp; (2D) &amp; Sch. 5</td>
<td>27.10.2011</td>
</tr>
<tr>
<td>2013/042</td>
<td>s. 8(2)(c)</td>
<td>28.2.2013</td>
</tr>
<tr>
<td>2013/043</td>
<td>ss. 2(1), 5(1A), 6(3), Schs. 1, 2 &amp; 3</td>
<td>15.3.2013</td>
</tr>
</tbody>
</table>

**EU Legislation/International Agreements involved:**

- Directive 75/442/EC
- Directive 80/68/EEC
- Directive 91/157/EEC
- Directive 91/689/EC
- Directive 1999/31/EC

- Directive 2006/66/EC
- Directive 2011/97/EU
- Decision 94/3
- Decision 2000/532/EC
- Decision 2003/33/EC

**English sources:**

None cited
ARRANGEMENT OF SECTIONS.

Sections.

1. Title and commencement.
2. Interpretation and scope.
3. Requirement for a permit.
4. Classification of landfill.
5. Prohibition of acceptance of certain wastes.
6. Waste to be accepted in the different classes of landfill.
7. Application for a permit.
8. Conditions of the permit.
9. Content of the landfill permit.
10. Cost of the landfill of waste.
12. Control and monitoring procedures in the operational phase.
13. Closure and after-care procedures.
15. Charges by the regulator.
17. Regulations.

SCHEDULE 1
WASTE ACCEPTANCE CRITERIA.

SCHEDULE 2
GENERAL REQUIREMENTS FOR ALL CLASSES OF LANDFILLS.

SCHEDULE 3
MONITORING PROCEDURES IN OPERATION
AND AFTER-CARE PHASES

SCHEDULE 4
PROVISIONS RELATING TO ACCEPTANCE OF WASTE
SUPPLEMENTARY TO SCHEDULE 1

SCHEDULE 5
TREATMENT REQUIREMENTS
AN ACT TO TRANSPOSE INTO THE LAW OF GIBRALTAR THE PROVISIONS OF COUNCIL DIRECTIVE 1999/31/EC OF 26 APRIL 1999 ON THE LANDFILL OF WASTE.

Title and commencement.

1. This Act may be cited as the Landfill Act 2002 and comes into operation on the day appointed by the Minister for the Environment by notice in the Gazette.

Interpretation and scope.

2. (1) In this Act, unless the context otherwise requires−

“automotive battery or accumulator” means any battery or accumulator used for automotive starter, lighting or ignition power;


“battery” or “accumulator” means any source of electrical energy generated by direct conversion of chemical energy and consisting of one or more primary battery cells (non-rechargeable) or one or more secondary battery cells (rechargeable), but does not include a battery or accumulator which is excluded from the scope of the Environment (Waste) Regulations 2007 pursuant to regulation 14B of those Regulations;

“biodegradable waste” means any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food or garden waste, and paper and cardboard;

“closure and after-care procedures” means the procedures set out in section 13;


“hazardous waste” has the meaning given by section 192KA of the Public Health Act;

“holder” means the producer of waste or the person who is in possession of it;
“industrial battery or accumulator” means any battery or accumulator designed for exclusively industrial or professional uses or used in any type of electric vehicle;

“inert waste” means waste which has the following properties—

(a) it does not undergo any significant physical, chemical or biological transformations;

(b) it does not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health; and

(c) its total leachability and pollutant content and the ecotoxicity of its leachate are insignificant and, in particular, do not endanger the quality of any surface water or groundwater;

“landfill” has the meaning given to it by subsection (3);

“landfill gas” means any gas generated from landfilled waste;

“landfill permit” means a permit for landfill issued by the regulator in accordance with this Act;

“leachate” means any liquid percolating through deposited waste and emitted from or contained within a landfill;

“liquid waste” means any waste in liquid form but excluding sludge;

“the Minister” means the Minister with responsibility for the environment;

“municipal waste” means waste from households as well as other waste which because of its nature or composition is similar to waste from households;

“non-hazardous waste” means waste which is not hazardous waste;

“operator” means the person responsible for the landfill;

“portable battery or accumulator” means any battery, button cell, battery pack or accumulator that—

(a) is sealed;

(b) can be hand-carried; and
(c) is neither an industrial battery or accumulator nor an automotive battery or accumulator;

“temporary storage” in relation to metallic mercury means for a period of more than 1 year but for no more than 5 years;

“the regulator” means the Environmental Agency which is the authority designated as responsible for performing the duties of the regulator set out in this Act;

“relevant waste acceptance criteria” means, in relation to a landfill, the waste acceptance criteria set out in Schedule 1 which apply to the class of landfill to which that landfill belongs;

“treatment” means physical, thermal, chemical or biological processes, including sorting, that change the characteristics of waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery, except in relation to waste batteries;

“waste” has the meaning given to it in section 192A of the Public Health Act.

(2) Expressions, other than those set out in subsection (1), which are used in this Act and which are also used in the Directive shall have the same meaning as in the Directive.

(2B) The terms “automotive battery or accumulator”, “battery or accumulator”, “industrial battery or accumulator” and “portable battery or accumulator” in subsection (1) shall be interpreted in the same way as those terms are interpreted and applied in the Environment (Waste) Regulations 2007.

(3) For the purposes of this Act, landfill means a waste disposal site for the deposit of waste onto land or underground and shall include sites described in subsection (4) and exclude the sites described in subsection (5).

(4) The sites to be included are–

   (a) internal waste disposal sites, that is to say a site where a producer of waste is carrying its own waste disposal at the place of production; and

   (b) any site which is used for the temporary storage of waste for more than one year.

(5) The sites to be excluded are–
(a) any facility where waste is unloaded in order to permit its preparation for further transport for recovery, treatment or disposal elsewhere;

(b) any site where waste is stored prior to recovery or treatment for a period of less than three years as a general rule; and

(c) any site where waste is stored prior to disposal for a period of less than one year.

(6) This Act does not apply to-

(a) the spreading of sludges, including sewage sludges and sludges resulting from dredging operations, and similar matter on the soil for the purposes of fertilisation or improvement;

(b) the use of suitable inert waste for redevelopment, restoration and filling-in work or for construction purposes; and

(c) the deposit of unpolluted soil or of non-hazardous inert waste resulting from prospecting and extraction, treatment and storage of mineral resources and from the operation of quarries.

Requirement for a permit.

3. No person shall operate a landfill except under and to the extent authorised by a landfill permit.

Classification of landfill.

4. Before granting a landfill permit, the regulator shall classify the landfill-

(a) as a landfill for hazardous waste;

(b) as a landfill for non-hazardous waste; or

(c) as a landfill for inert waste.

Prohibition of acceptance of certain wastes.

5.(1) The operator of a landfill shall not accept any of the following types of waste at the landfill—

(a) liquid waste;

(b) waste which, in the conditions of landfill, is explosive, corrosive, oxidising, flammable or highly flammable;
(c) hospital and other clinical wastes which arise from medical or veterinary establishments and which are infectious;

(d) chemical substances arising from research and development or teaching activities, such as laboratory residues, which are not identified or which are new, and whose effects on man or on the environment are not known;

(e) as from 16th July 2003, whole used tyres other than—
   (i) tyres used as engineering material;
   (ii) bicycle tyres; and
   (iii) tyres with an outside diameter above 1400mm;

(f) as from 16th July 2006, shredded used tyres other than—
   (i) bicycle tyres; and
   (ii) tyres with an outside diameter above 1400mm;

(fa) waste industrial or automotive batteries; and

(g) any waste which does not fulfil the relevant waste acceptance criteria.

(1A) Metallic mercury is exempted from the prohibition in paragraph (1)(a).

(2) The operator of a landfill shall not accept waste which has been diluted or mixed solely to meet the relevant waste acceptance criteria.

(2A) Subsection (1)(fa) does not prohibit the acceptance of residues of any batteries and accumulators that have undergone both treatment and recycling, provided that the treatment and recycling—

   (a) used best available techniques, in terms of the protection of health and the environment; and

   (b) complied, as a minimum, with European Union legislation, in particular as regards health and safety and waste management.

(2B) This section shall not apply—
(a) to the disposal of portable batteries and accumulators in landfills or underground storage if no viable end market is available for portable batteries or accumulators that contain cadmium, mercury or lead; or

(b) where as part of a strategy to phase out heavy metals, and based on a detailed assessment of the environmental, economic, and social impacts, the disposal of portable batteries and accumulators in landfills or underground storage is to be preferred over recycling.

(2C) The detailed assessment referred to in subsection (2B)(b) shall be made public and the Competent Authority shall ensure that the Commission is notified of draft measures in accordance with the provisions of Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society Services.

(2D) For the purposes of subsections (2A) and (2B) waste batteries and accumulators shall be deemed to have been treated where the minimum requirements set out in Schedule 5 have been attained.

(3) For the purposes of this section, waste is-

“corrosive” if it consists of substances and preparations which may destroy living tissue on contact;

“explosive” if it consists of substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene;

“flammable” if it consists of liquid substances and preparations having a flash point equal to or greater than 21°C and less than or equal to 55°C;

“highly flammable” if it consists of-

(a) liquid substances and preparations having a flash point below 21°C (including extremely flammable liquids);

(b) substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy;

(c) solid substances and preparations which may readily catch fire after brief contact with a source of ignition and
which continue to burn or to be consumed after removal of the source of ignition;

(d) gaseous substances and preparations which are flammable in air at normal pressure;

(e) substances and preparations which, in contact with water or damp air, evolve highly flammable gases in dangerous quantities;

“infectious” if it consists of substances containing viable microorganisms or their toxins which are known or reliably believed to cause disease in man or other living organisms; and

“oxidising” if it consists of substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances.

Waste to be accepted in the different classes of landfill.

6.(1) Subject to subsection (2), the operator of a landfill shall only accept waste that has been subject to treatment.

(2) The operator of a landfill may accept waste that has not been subject to treatment if–

(a) it is inert waste for which treatment is not technically feasible; or

(b) subject to subsections (3), (4) and (5), as appropriate, it is waste other than inert waste and treatment would not reduce the quantity of the waste or the hazards to human health or the environment.

(3) The operator of a landfill for hazardous waste shall only accept waste which fulfils the waste acceptance criteria set out in paragraphs 1, 2, 6 and 7 of Schedule 1 and Schedule 4.

(4) The operator of a landfill for non-hazardous waste shall only accept–

(a) municipal waste;

(b) non-hazardous waste of any other origin which fulfils the waste acceptance criteria set out in paragraphs 1 and 3(a) of Schedule 1; and
(c) stable, non-reactive hazardous waste (such as that which is solidified or vitrified) with leaching behaviour equivalent to that of non-hazardous waste referred to in subsection 4(b) and which fulfils the waste acceptance criteria set out in paragraphs 1 and 3(b) of Schedule 1.

(5) Where waste of the type described in subsection (4)(c) above is disposed of at a landfill for non-hazardous waste, the operator shall ensure it is not deposited in cells used or intended to be used for the disposal of biodegradable non-hazardous waste.

(6) The operator of a landfill for inert waste shall only accept inert waste which meets the waste acceptance criteria set out in paragraphs 1 and 4 of Schedule 1 and Schedule 4.

(7) The sampling and testing methods listed in section 3 of Schedule 4 shall be used for determining the acceptability of waste at landfills.

(8) Nothing in Schedule 4 applies in relation to waste resulting from prospecting, extraction, treatment and storage of mineral resources nor from the working of quarries, when they are deposited on-site.

**Application for a permit.**

7.(1) An application to the regulator for a landfill permit shall be in writing and shall contain the following information–

(a) the name of the applicant and, when they are different persons, the operator;

(b) the description of the types and total quantity of waste to be deposited;

(c) the proposed capacity of the disposal site;

(d) the description of the site, including its hydrogeological and geological characteristics;

(e) the proposed methods for pollution prevention and abatement;

(f) the proposed operation, monitoring and control plan;

(g) the proposed plan for the closure and after-care procedures;

(h) where an environmental statement is required under the Town Planning (Environmental Impact Assessment) Regulations
2000, the information placed on the register pursuant to regulation 12 of those regulations;

(i) the financial security, or any other equivalent provision, arranged by the applicant to ensure that the obligations arising under the landfill permit are discharged and the closure and after-care procedures are followed.

(2) The information contained in an application for a permit may be made available by the regulator—

(a) to a member of the public, on request; and

(b) to such persons as the regulator may think fit.

Conditions of the permit.

8.(1) The regulator shall not issue a landfill permit unless it is satisfied that—

(a) the site complies with the requirements of this Act;

(b) the site will be managed by a person who is technically competent;

(c) the management and staff of the operator are provided with professional and technical development and training;

(d) the site will be operated in such a manner that the necessary measures are taken to prevent accidents and limit their consequences;

(e) the financial security, or any other equivalent provision, arranged by the applicant to ensure that the obligations arising under the landfill permit are discharged and the closure and after-care procedures are followed.

(2) The regulator shall include conditions in the landfill permit to ensure that—

(a) the provision required by subsection (1)(e) is maintained until the landfill permit is surrendered in accordance with this Act.

(b) the landfill is in line with the waste management plan prepared under section 192M of the Public Health Act.

(c) any conditions required by the Industrial Emissions Regulations 2013 are included.
(3) The regulator shall inspect the site prior to the commencement of disposal operations in order to ensure that it complies with the relevant conditions of the landfill permit.

Content of the landfill permit.

9. A landfill permit shall include—

(a) a statement of the class of the landfill;

(b) conditions specifying the defined types and total quantity of waste authorised to be deposited in the landfill;

(c) conditions applying to—

(i) preparations for landfill operations;

(ii) carrying out landfill operations; and

(iii) monitoring and control procedures, including contingency plans;

(d) conditions making provisional requirements for the closure and after-care operations;

(e) conditions requiring the operator to report at least annually to the regulator on—

(i) the types and quantities of waste disposed of; and

(ii) the results of the monitoring programme required by sections 12 and 13;

(f) conditions requiring compliance with this Act including Schedule 2; and

(g) such other conditions as appear appropriate to the regulator.

Cost of the landfill of waste.

10. The operator of a landfill shall ensure that the charges it makes for the disposal of waste on its landfill cover—

(a) the costs of the setting up and operation of the landfill;
(b) the costs of the provision of financial security, or any other equivalent provision, to ensure that the obligations arising under the landfill permit are discharged and the closure and after-care procedures are followed; and

(c) the estimated costs of the closure and after-care of the site for a period of at least 30 years from its closure.

Waste acceptance procedures.

11.(1) Prior to or at the time of delivery of the waste to the landfill—

(a) the operator shall have supplied the holder with documentation setting out the conditions set in the landfill permit; and

(b) the holder shall have supplied the operator with documentation showing that the waste fulfils-

(i) the conditions set in the landfill permit; and

(ii) the relevant waste acceptance criteria.

(2) The operator shall check the waste documentation required by legislation including, where relevant—

(a) the identification form applying to hazardous waste; and

(b) the documents required by Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community.

(3) The operator shall, in accordance with such procedures as are specified by the regulator, test waste to establish whether it corresponds to the description in the accompanying documents and, if representative samples are taken for analysis, the operator shall retain the samples and results of any analysis for at least one month.

(4) The operator shall keep a register showing-

(a) the quantities of waste deposited;

(b) its characteristics;

(c) its origin;
(d) the dates of its delivery;

(e) the identity of the producer or, in the case of municipal waste, the collector; and

(f) in the case of hazardous waste, its precise location on the site.

(5) The information required to be kept under subsection (4) shall be made available to the regulator on request.

(6) The operator on accepting each delivery of waste shall provide a written receipt to the person delivering it.

(7) Where waste is not accepted at a landfill, the operator shall inform the regulator of that fact as soon as reasonably possible.

(8) The operator shall visually inspect the waste at the entrance and at the point of deposit and, as appropriate, he shall verify conformity with the description provided in the documentation submitted by the holder. Where representative samples are taken in accordance with the provisions of this Act, results of the analyses shall be kept in accordance with the provisions of this Act. The samples shall be kept for at least one month.

Control and monitoring procedures in the operational phase.

12.(1) The following requirements shall apply to landfill sites from the start of the operational phase until definitive closure.

(2) The operator shall carry out the control and monitoring procedures set out in Schedule 3.

(3) Where the procedures required by subsection (2) reveal any significant adverse environmental effects, the operator shall notify the regulator as soon as reasonably possible.

(4) When it receives a notification of significant adverse environmental effects in accordance with subsection (3), the regulator shall determine the nature and timing of corrective measures that are necessary and shall require the operator to carry them out.

(5) The operator shall report at least once a year or at intervals specified by the regulator if they are more frequent, on the basis of aggregated data, the results of monitoring and on such other matters which the regulator requires to demonstrate compliance with the conditions of the landfill permit or to increase its knowledge of the behaviour of waste in landfill.
(6) The operator shall ensure that quality control in respect of the following is carried out by competent laboratories—

(a) analytical operations of control and monitoring procedures; and

(b) analyses of representative samples taken in accordance with section 11(3).

Closure and after-care procedures.

13.(1) The following procedures shall apply to all landfill sites.

(2) The procedures may relate to the closure of the whole of the landfill or part of it.

(3) The closure shall begin—

(a) when the conditions specified in the landfill permit are satisfied;

(b) when the regulator approves a request from the operator for closure to begin; or

(c) when the regulator issues a reasoned decision that closure should begin.

(4) A landfill shall not be definitively closed until—

(a) such reports as may be required by the regulator have been submitted to it by the operator; and

(b) the regulator—

(i) has assessed all the reports submitted by the operator;

(ii) has carried out a final on-site inspection; and

(iii) has notified the operator in writing that it approves the closure.

(5) Following definitive closure of a landfill, the operator shall—

(a) remain responsible for the maintenance, monitoring and control for such period as the regulator determines is reasonable, taking into account the time during which the landfill could present hazards;
(b) notify the regulator of any significant adverse environmental effects revealed by the control procedures and take the remedial steps required or approved by the regulator; and

(c) be responsible for monitoring and analysing landfill gas and leachate from the landfill and the groundwater regime in its vicinity in accordance with Schedule 3 for as long as the regulator considers that the landfill is likely to cause a hazard to the environment.

(6) The operator shall not be relieved from liability under the conditions of the landfill permit by reason of the approval of closure by the regulator under subsection (4)(b)(iii).

National strategy.

14. The Minister shall set up a national strategy for the implementation of the reduction of biodegradable waste going to landfills and shall ensure that it is notified to the Commission by 16 July 2003.

Charges by the regulator.

15.(1) Where the regulator incurs costs in carrying out its functions under this Act it may charge a fee determined in accordance with this section to any person carrying on an activity to which this Act applies.

(2) The fee shall not exceed the sum of the costs reasonably incurred by the regulator in dealing with the activity to which this Act applies.

(3) Where, in the opinion of the regulator, it can properly carry out its functions under this Act only by engaging specialists and consultants, the cost of such specialists and consultants shall be included in the fee payable under sub-section (1).

(4) When requiring payment the regulator shall send or give to the person by whom the fee is payable, if that person so requests, a detailed statement of the work done and costs incurred and the period to which the statement relates and the requirements of this Act shall be deemed not to have been complied with unless the fee, or such proportion of it as the regulator may in its discretion specify, has been paid.

(5) The fee or such part of it as remains unpaid shall be recoverable as a civil debt.

Offences.
16.(1) It shall be an offence for a landfill operator to contravene the provisions of this Act.

(2) A person who is guilty of an offence under subsection (1) shall be liable on summary conviction to a fine up to level 5 on the standard scale.

(3) Where an offence under this section committed by a body corporate is proved to have been committed with the consent or connivance of, or to have been attributable to any neglect on the part of, any director, manager, secretary or other similar officer of the body corporate or a person who was purporting to act in any such capacity, he as well as the body corporate shall be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

(4) Where the affairs of a body corporate are managed by its members, subsection (3) shall apply in relation to the acts or defaults of a member in connection with his functions of management as if he were a director of the body corporate.

(5) Where the commission by any person of an offence under this section is due to the act or default of some other person, that other person may be charged with and convicted of the offence by virtue of this subsection whether or not proceedings for the offence are taken against the first-mentioned person.

Regulations.

17. The Minister may make regulations for the purposes of implementing this Act and the Directive.
SCHEDULE 1

WASTE ACCEPTANCE CRITERIA

Criteria for acceptance of waste which apply to all kinds of landfill.

1.(1) The following criteria shall apply to the acceptance of waste at any landfill.

(2) Waste may only be accepted at a landfill where its acceptance would not-

(a) result in unacceptable emissions to groundwater, surface water or the surrounding environment;

(b) jeopardise environment protection systems (such as liners, leachate and gas collection and treatment systems) at the landfill;

(c) put at risk waste stabilisation processes (such as degradation or wash out) within the landfill; or

(d) endanger human health.

Additional criteria for acceptance of waste at landfills for hazardous waste.

2. Waste may only be accepted at a landfill for hazardous waste if-

(a) it is-

(i) any waste listed in the index annexed to the Commission Decision on Wastes which is identified as hazardous waste pursuant to paragraph 4 of the Annex to that Decision; or

(ii) any waste which has similar characteristics to the wastes referred to in sub-paragraph (i); and

(b) its total content or leachability-

(i) does not present a short term occupational risk or an environmental risk; and
would not prevent the stabilisation of the landfill within its projected lifetime taking account of its after care period following closure.

Additional criteria for acceptance of waste at landfills for non-hazardous waste.

3. Waste may only be accepted at a landfill for non-hazardous waste if-

(a) it is-

(i) any waste listed in the index annexed to the Commission Decision on Wastes but which is not identified as hazardous waste pursuant to paragraph 4 of the Annex to that Decision; or

(ii) any waste which has similar characteristics to the wastes referred to in sub-paragraph (i); or

(b) it is–

(i) any waste listed in the index annexed to the Commission Decision on Wastes which is identified as hazardous waste pursuant to paragraph 4 of the Annex to that Decision; or

(ii) any waste which has similar characteristics to the wastes referred to in sub-paragraph (i),

and its deposit at the landfill otherwise meets the requirements of section 6(4)(c) and (5).
Additional criteria for acceptance of waste at landfills for inert waste.

4. Waste may only be accepted at a landfill for inert waste if it is listed in the following Table or it otherwise falls within the definition of inert waste.

**WASTE ACCEPTABLE AT LANDFILLS FOR INERT WASTE**

<table>
<thead>
<tr>
<th>European Waste Catalogue Code</th>
<th>Description</th>
<th>Exclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 11 03</td>
<td>Waste glass based fibrous materials</td>
<td></td>
</tr>
<tr>
<td>15 01 07</td>
<td>Glass packaging</td>
<td></td>
</tr>
<tr>
<td>17 01 01</td>
<td>Concrete</td>
<td></td>
</tr>
<tr>
<td>17 01 02</td>
<td>Bricks</td>
<td></td>
</tr>
<tr>
<td>17 01 03</td>
<td>Tiles and ceramics</td>
<td></td>
</tr>
<tr>
<td>17 02 02</td>
<td>Glass</td>
<td></td>
</tr>
<tr>
<td>17 05 04</td>
<td>Soil and stones</td>
<td>Excluding topsoil, peat</td>
</tr>
<tr>
<td>20 01 02</td>
<td>Glass</td>
<td></td>
</tr>
<tr>
<td>20 02 02</td>
<td>Soil and stones</td>
<td>Excluding topsoil, peat</td>
</tr>
</tbody>
</table>


**Specific requirements for metallic mercury.**

6.(1) The composition of metallic mercury for temporary storage must—

(a) be of a mercury content greater than 99.9% per weight; and

(b) have no impurities capable of corroding carbon or stainless steel, (for example, nitric acid solution, chloride salts solutions).

(2) The containers used for temporary storage of metallic mercury must—

(a) be resistant to corrosion and shock;

(b) have no welds in the container;

(c) be made from either carbon steel (ASTM A36 minimum) or stainless steel (AISI 304, 316L);

(d) be gas and liquid tight;
(e) have an outer side resistant against the storage conditions;

(f) have a design type that must pass the drop test and the leakproofness tests as described in Chapters 6.1.5.3 and 6.1.5.4 of the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria; and

(g) be filled to a maximum fill ratio of 80% of the overall volume of the container, to ensure that sufficient ullage is available and neither leakage nor permanent distortion of the container can occur as a result of an expansion of the liquid due to high temperature.

Certificates for metallic mercury storage.

7.(1) The containers referred to in paragraph 6 require a certificate as provided for in subparagraph (2).

(2) Certificates must be issued if the metallic mercury and the containers fulfil the criteria set out in paragraph 6 and subparagraph (3).

(3) Containers must—

(a) be visually inspected before storage and not be damaged, leaking or corroded;

(b) bear a durable stamp (made by punching) which must detail the following information of the container—

(i) the identification number;

(ii) the construction material;

(iii) the empty weight;

(iv) the reference of the manufacturer; and

(v) the date of construction.

(4) The containers must bear a plate permanently fixed to them corresponding to the identification number of the certificate once the certificate is granted.

(5) The certificate must include the following—

(a) name and address of the waste producer;
(b) name and address of the person responsible for the filling;

(c) place and date of filling;

(d) quantity of the mercury;

(e) the purity of the mercury and, if relevant, a description of the impurities, including the analytical report;

(f) confirmation that the containers have been used exclusively for the transport and storage of mercury;

(g) the identification numbers of the containers;

(h) a certificate identification number; and

(i) any specific comments.

(6) Certificates must be issued by the producer of the waste or, in default, by the person responsible for its management.
SCHEDULE 2

GENERAL REQUIREMENTS FOR ALL CLASSES OF LANDFILLS

Location.

1.(1) The location of a landfill must take into consideration requirements relating to-

(a) the distances from the boundary of the site to residential and recreational areas, waterways, water bodies and other agricultural or urban sites;

(b) the existence of groundwater, coastal water or nature protection zones in the area;

(c) the geological or hydrogeological conditions in the area;

(d) the risk of flooding, subsidence, landslides or avalanches on the site; and

(e) the protection of the natural or cultural heritage in the area.

(2) A landfill permit may be issued for the landfill only if-

(a) the characteristics of the site with respect to the requirements in sub-paragraph (1); or

(b) the corrective measures to be taken,

indicate that the landfill does not pose a serious environmental risk.

(3) In this regulation “nature protection zone” means–

(a) a marine nature area or a nature conservation area as defined in section 2(1) of the Nature Protection Act 1991; or

(b) a European site or a European Marine site within the meaning of section 17E of the Nature Protection Act 1991.

Water control and leachate management.

2.(1) Subject to the following provisions of this paragraph, appropriate arrangements shall be made with regard to the characteristics of the landfill and prevailing meteorological conditions in order to-
Landfill

(a) control water from precipitations entering the landfill body;

(b) prevent surface water or groundwater from entering into the landfilled waste;

(c) collect contaminated water and leachate;

(d) treat contaminated water and leachate to the appropriate standard so that it can be discharged.

(2) Arrangements need not be made in accordance with sub-paragraph (1)(c) if the regulator decides that the landfill poses no potential hazard to the environment in view of its location and the kinds of waste to be accepted at the landfill.

(3) This paragraph shall not apply to landfills for inert waste.

Protection of soil and water.

3.(1) The landfill must be situated and designed so as to-

(a) provide the conditions for prevention of pollution of the soil, groundwater or surface water; and

(b) ensure efficient collection of leachate as and when required by paragraph 2.

(2) Soil, groundwater and surface water is to be protected by--

(a) the use of a geological barrier combined with a bottom liner during the operational phase of the landfill; and

(b) the use of a geological barrier combined with a top liner following closure and during the passive phase.

(3) The geological barrier shall comply with the requirements of sub-paragraph (4) and shall also provide sufficient attenuation capacity to prevent a potential risk to soil and groundwater, taking into account the geographic and hydrogeological conditions below and in the vicinity of the landfill site.

(4) The landfill base and sides shall consist of a mineral layer which provides protection of soil, groundwater and surface water at least equivalent to that resulting from the following permeability and thickness requirements--
(a) in a landfill for hazardous waste: $k \leq 1.0 \times 10^{-9}$ metre/second: thickness $\geq 5$ metres;

(b) in a landfill for non-hazardous waste: $k \leq 1.0 \times 10^{-9}$ metre/second: thickness $\geq 1$ metres;

(c) in a landfill for inert waste: $k \leq 1.0 \times 10^{-7}$ metre/second: thickness $\geq 1$ metres.

(5) Where the geological barrier does not meet the requirements of sub-paragraph (4) naturally, it may be completed artificially and reinforced by other means providing equivalent protection but in any such case, a geological barrier established by artificial means must be at least 0.5 metres thick.

(6) A leachate collection and sealing system to ensure that leachate accumulation at the base of the landfill is kept to a minimum must also be provided in any hazardous or non-hazardous landfill in accordance with the following table-

**Leachate collection and bottom sealing**

<table>
<thead>
<tr>
<th>Landfill category</th>
<th>Non-hazardous</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial sealing liner</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Drainage layer $\geq 0.5$ metres</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>

(7) Where, the potential hazards to the environment indicate that the prevention of leachate formation is necessary, surface sealing may be prescribed by the regulator taking account of the following guidelines-

<table>
<thead>
<tr>
<th>Landfill category</th>
<th>Non-hazardous</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas drainage layer</td>
<td>Required</td>
<td>Not required</td>
</tr>
<tr>
<td>Artificial sealing liner</td>
<td>Not required</td>
<td>Required</td>
</tr>
<tr>
<td>Impermeable mineral layer</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Drainage layer $\geq 0.5$ metres</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Top soil cover $&gt; 1$ metres</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>

(8) The requirements of sub-paragraphs (3) to (7) may be reduced to an appropriate extent if on the basis of an assessment of environmental risks, having regard in particular to the principles of Directive 80/68/EEC of 17 December 1997 on the protection of groundwater against pollution-

(a) it has been decided in accordance with paragraph 2 that the collection and treatment of leachate is not necessary; or
(b) it is established that the landfill poses no potential hazard to soil, groundwater or surface water.

Gas control.

4.(1) Appropriate measures must be taken in order to control the accumulation and migration of landfill gas.

(2) Landfill gas must be collected from all landfills receiving biodegradable waste and the landfill gas must be treated and, to the extent possible, used. If the gas collected cannot be used to produce energy, it must be flared.

(3) The collection, treatment and use of landfill gas under sub-paragraph (2) must be carried on in a manner which minimises damage to or deterioration of the environment and risk to human health.

Nuisances and hazards.

5.(1) Measures must be taken to minimise the nuisances arising from the landfill through-

(a) emissions of odours and dust;

(b) wind-blown materials;

(c) noise and traffic;

(d) birds, vermin and insects;

(e) the formation of aerosols; and

(f) fires.

(2) The landfill must be equipped so that dirt originating from the site is not dispersed onto public roads and the surrounding land.

Stability.

6.(1) The placement of waste must ensure stability of all the waste on the site and associated structures and in particular must avoid slippages.

(2) Where an artificial barrier is used, the geological substratum must be sufficiently stable, taking into account the morphology of the landfill, to prevent settlement that may cause damage to the barrier.

Barriers.
7. (1) The landfill must be secured to prevent free access to the site.

(2) The gates of the landfill must be locked outside operating hours.

(3) The system of control and access to each facility must provide systems to detect and discourage illegal dumping in the facility.

Temporary storage of metallic mercury.

8. (1) Temporary storage of metallic mercury must be separate from other waste and in containers which must be stored in collecting basins that—

   (a) are suitably coated so as to be free of cracks and gaps;
   
   (b) are impervious to metallic mercury; and
   
   (c) have a containment volume adequate for the total quantity of mercury stored,

and such containers must be stored in a storage site.

(2) The storage site referred to in subparagraph (1) must—

   (a) be provided with engineered or natural barriers that are adequate to protect the environment against mercury emissions;
   
   (b) have a containment volume adequate for the total quantity of mercury stored;
   
   (c) have floors covered with mercury-resistant sealants and a slope with a collection sump must be provided;
   
   (d) be equipped with a fire protection system; and
   
   (e) be arranged in a way to ensure that all containers are easily retrievable.
SCHEDULE 3

Sections 12(2) and 13(5)(c)

MONITORING PROCEDURES IN OPERATION AND AFTER-CARE PHASES

Minimum procedures.

1. This Schedule sets out minimum procedures for monitoring to be carried out to check-

   (a) that waste has been accepted for disposal only if it fulfils the relevant waste acceptance criteria;

   (b) that the processes within the landfill proceed as desired;

   (c) that environmental protections systems are functioning fully as intended; and

   (d) that the conditions of the landfill permit are fulfilled.

Emission data.

2.(1) Samples of leachate or surface water (if present) must be collected at representative points.

   (2) Sampling and measuring of the volume and composition of any leachate must be performed separately at each point at which leachate is discharged from the site.

   (3) Monitoring of surface water (if present) shall take place at least two points, one upstream from the landfill and one downstream.

   (4) Gas monitoring must be carried out for each section of the landfill and representative samples must be collected and analysed in accordance with Table 1.

   (5) A representative sample of leachate and water shall be taken for monitoring purposes in accordance with Table 1.

| TABLE 1 |
|-------------------------------|-------------------|---------------------------|
| Leachate volume<sup>2</sup>    | Monthly<sup>1, 3</sup> | Every six months          |
| Leachate composition<sup>2, 4</sup> | Quarterly<sup>1</sup> | Every six months          |
Protection of groundwater.

3.(1) The sampling measurements taken must be sufficient to provide information on groundwater likely to be affected by the discharge from the landfill, with at least one measuring point in the groundwater inflow region and two in the outflow region.

(2) The number of measurements referred to sub-paragraph (1) may be increased on the basis of a specific hydrogeological survey or the need for an early identification of accidental leachate release in the groundwater.

(3) Sampling must be carried out in at least three locations before filling operations in order to establish reference values for future sampling.

4.(1) The monitoring of groundwater shall be carried out in accordance with Table 2.

(2) The parameters to be analysed in the samples taken must be derived from the expected composition of the leachate and the groundwater quality in the area.

(3) In selecting the parameters for analysis, the mobility in the groundwater zone must be taken into account.

(4) Parameters may include indicator parameters in order to ensure an early recognition of change in water quality (the recommended parameters are pH, TOC, phenols, heavy metals, fluoride, AS, oil/hydrocarbons).
TABLE 2

<table>
<thead>
<tr>
<th></th>
<th>Operational phase</th>
<th>After-care phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level of groundwater</strong></td>
<td>Every six months$^1$</td>
<td>Every six months$^1$</td>
</tr>
<tr>
<td><strong>Groundwater composition</strong></td>
<td>Site-specific frequency$^2$, $^3$</td>
<td>Site-specific frequency$^2$, $^3$</td>
</tr>
</tbody>
</table>

Notes to Table 2

1 If there are fluctuating groundwater levels, the frequency must be increased.
2 The frequency must be based on the possibility for remedial action between two samplings if a trigger level is reached, i.e. the frequency must be determined on the basis of knowledge and the evaluation of the velocity of groundwater flow.
3 When a trigger level is reached (see paragraph 5), verification is necessary by repeating the sampling. When the level has been confirmed, a contingency plan set out in the landfill permit conditions must be followed.

Trigger levels.

5.(1) Significant adverse environmental effects, as referred to in sections 12(4) and 13(5)(b), should be considered to have occurred in the case of groundwater when an analysis of a groundwater sample shows a significant change in water quality.

(2) The level at which the effects referred to in sub-paragraph (1) are considered to have occurred (“the trigger level”) must be determined taking account of the specific hydrogeological formations in the location of the landfill and groundwater quality.

(3) The trigger level must be set out in the conditions of the landfill permit whenever possible.

(4) The observations must be evaluated by means of control charts with established control rules and levels for each downgradient well.

(5) The control levels must be determined from local variations in groundwater quality.

Topography.

6. The topography of the site and settling behaviour of the landfill body shall be monitored in accordance with Table 3.

TABLE 3

<table>
<thead>
<tr>
<th></th>
<th>Operational phase</th>
<th>After-care phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structure and composition of</strong></td>
<td>Yearly</td>
<td></td>
</tr>
<tr>
<td>landfill body</td>
<td>Yearly</td>
<td>Yearly reading</td>
</tr>
<tr>
<td>--------------</td>
<td>--------</td>
<td>----------------</td>
</tr>
<tr>
<td>Settling behaviour of the level of the landfill body</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note to Table 3**

1 Data for the status plan of the relevant landfill: surface occupied by waste, volume and composition of waste, methods of depositing, time and duration of depositing, calculation of the remaining capacity still available at the landfill.

**Specific requirements for metallic mercury.**

7.(1) Temporary storage of metallic mercury must be monitored by a continuous mercury vapour monitoring system with a sensitivity of at least 0.02 milligrams of mercury per cubic metre and it must—

(a) be installed in the storage site, with sensors positioned at ground level and head level; and

(b) include a visual and acoustic alert system, which must be maintained annually.

(2) The storage site and containers must be visually inspected by the landfill permit holder at least once a month.

(3) The operator must on detection of a leak immediately take all necessary action to—

(a) avoid any emission of mercury to the environment; and

(b) restore the safety of the storage of the mercury.

(4) Any leak of mercury must be considered to have significant adverse environmental effects for the purposes of section 12(3).

(5) Emergency plans and adequate protective equipment suitable for handling metallic mercury must be available on site.

(6) All documents containing the information referred to in Schedule 6 and in subparagraphs (1) to (5), including—

(a) the certificate accompanying the container;

(b) records concerning the destocking and dispatch of the metallic mercury after its temporary storage; and

(c) the destination and intended treatment,
must be kept for at least 3 years after the termination of the storage.
Landfill

2002-18

SCHEDULE 4

PROVISIONS RELATING TO ACCEPTANCE OF WASTE
SUPPLEMENTARY TO SCHEDULE 1
(Annex to Council Decision 2003/33/EC)

ANNEX

CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS

Introduction

This Annex lays down the uniform waste classification and acceptance procedures according to Annex II to Directive 1999/31/EC on the landfill of waste (the Landfill Directive).

In accordance with Article 174 of the Treaty, Member States are not prevented from maintaining or introducing more stringent protective measures than those established in this Annex, provided that such measures are compatible with the Treaty. Such measures shall be notified to the Commission. This could be of particular relevance with reference to the limit values for cadmium and mercury in section 2. Member States may also introduce limit values for components not included in section 2.

Section 1 of this Annex lays down the procedure to determine the acceptability of waste at landfills. This procedure concerns the basic characterisation, compliance testing and on-site verifications as defined in section 3 of Annex II to the Landfill Directive.

Section 2 of this Annex lays down the acceptance criteria for landfill class. Waste may be accepted at a landfill only if it fulfils the acceptance criteria of the relevant landfill class as laid down in section 3 of this Annex.

Section 3 of this Annex lists the methods to be used for the sampling and testing of waste.

Appendix A defines the safety requirements to be carried out for underground storage.

Appendix B is an informative Annex providing an overview of the landfill options available within the Directive and examples of possible reprocessing of landfill non-hazardous waste.

I. PROCEDURE FOR THE ACCEPTANCE OF WASTE AT LANDFILLS

1.1. BASIC CHARACTERISATION

Basic characterisation is the first step in the acceptance procedure and constitutes a full characterisation of the waste by gathering all the necessary information for a safe disposal of the waste in the long term. Basic characterisation is required for each type of waste.

1.1.1. Functions of basic characterisation

(a) Basic information on the waste type and origin, composition, consistency, leachability and — where necessary and available — other characteristics, proportion

(b) Basic information for understanding the behaviour of waste in landfills and options for treatment as laid out in Article 9(1) of the Landfill Directive

(c) Assessing waste against limit values

(d) Determination of key variables (total parameters for compliance testing and categories for simplification of compliance testing) to a significant degree of accuracy to be measured, for each other determination of relevant information. Characterisation may alter for several basic characterisation and results of simplified test procedures as well as frequency for compliance testing.

If the basic characterisation of waste shows that the waste fulfils the criteria for a landfill class as laid down in section 2 of this Annex, the waste is deemed to be acceptable in this landfill class. If this is not the case, the waste is not acceptable at this landfill class.

The producer of the waste or, in default, the person responsible for its management, is responsible for ensuring that the characterisation information is correct.

The operator shall keep records of the required information for a period to be defined by the Member State.
1.1.2. Fundamental requirements for basic characterisation of the waste:

(a) Source and origin of the waste

(b) Information on the process producing the waste (description and characteristics of raw materials and products)

(c) Description of the waste treatment applied in compliance with Article 6(a) of the Landfill Directive, or a statement of reasons why such treatment is not considered necessary

(d) Data on the composition of the waste and the leaching behavior, where relevant

(e) Appearance of the waste (material, colour, physical form)

(f) Code according to the European waste list (Commission Decision 2000/13/ECE 9)

(g) For hazardous waste in case of inert waste enter the relevant hazardous properties according to Annex II to Council Directive 91/689/EEC of 22 December 1991 on hazardous waste 5

(h) Information to prove that the waste does not fall under the exclusion of Article 5(3) of the Landfill Directive

(i) The landfill sites at which the waste may be accepted

(j) If necessary, additional precautions to be taken at the landfill

(k) Check if the waste can be recycled or recovered.

1.1.3. Testing:

As a general rule, waste must be tested to obtain the above information. In addition to the testing behavor, the composition of the waste must be known or determined by testing. The tests used for basic characterisation must always include those to be used for compliance testing.

The content of the characterisation, the extent of laboratory testing required and the relationship between basic characterisation and compliance checking depends on the type of waste. A differentiation can be made between:

- wastes that are regularly generated in the same process
- wastes that are not regularly generated

The characterisations outlined in point (a) and (b) will provide information that can be directly compared with acceptance criteria for the relevant classes of landfill, and in addition, descriptive information can be supplied (e.g., the consequences of disposing with municipal waste).

(i) Wastes regularly generated in the same process

These are individual and consistent wastes regularly generated in the same process, where:

--- the installation and the process generating the waste are well known and the input materials to the process and the process layout are well defined.

--- the operator of the installation provides all necessary information and informs the operator of the landfill of changes to the process; especially changes to the input materials.

The process will often be at a single installation. The waste can also be from different installations, if it can be identified as single stream with common characteristics within known boundaries (e.g., bottom ash from the incineration of municipal waste).

For these wastes the basic characterisation will require the fundamental requirements listed in section 1.1.2 and especially the following:

--- compositional range for the individual wastes,

--- range and variability of characteristics properties,

--- if required, the leachability of the wastes determined by a batch leaching test and/or a precipitation test and/or a pH dependence test,

--- key variables to be tested on a regular basis.

[1] 15 L 177, 2001, p. 3
Landfill

If the waste is produced in the same process in different installations, information must be given on the scope of the production. Consequently, a sufficient number of measurements must be taken to show the range and variability of the characteristic properties of the waste. The waste can then be characterised and if the waste is produced in the same process in different installations, information must be given on the scope of the production. Consequently, a sufficient number of measurements must be taken to show the range and variability of the characteristic properties of the waste. The waste can then be characterised and shall subsequently be subject to compliance testing only, unless significant changes in the generation processes occur.

For waste from the same process in the same installation, the results of the measurements may show only minor variations of the properties of the waste in comparison with the appropriate limit values. The waste can then be considered characterised, and shall subsequently be subject to compliance testing only, unless significant changes in the generation process occur.

Waste from facilities for the bulking or mixing of waste from waste transfer stations or mixed waste streams from waste collectors can vary considerably in their properties. This must be taken into consideration in the basic characterisation. Such wastes may fall under case (b).

(b) Waste that are not regularly generated

These wastes are not regularly generated in the same process in the same installation and are not part of a well-characterised waste stream. Each batch produced of such waste will need to be characterised. The basic characterisation shall include the fundamental requirements for basic characterisation. As each batch produced has to be characterised, no compliance testing is needed.

1.4. Cases where testing is not required

Testing for basic characterisation can be dispensed with in the following cases:

(a) the waste is on a list of wastes not requiring testing as laid down in section 2 of this Annex;

(b) all the necessary information, for the basic characterisation, is known and duly justified to the full satisfaction of the competent authority;

(c) certain waste types where testing is impracticable or where appropriate testing procedures and acceptance criteria are untestable. This must be justified and documented, including the reasons why the waste is deemed acceptable at this landfill class.

1.2. Compliance testing

When waste has been deemed acceptable for a landfill class on the basis of a basic characterisation pursuant to section 1, it shall subsequently be subject to compliance testing to determine if it complies with the results of the basic characterisation and the relevant acceptance criteria as laid down in section 2.

The function of compliance testing is periodically to check regularly mixing waste streams.

The relevant parameters to be tested are determined in the basic characterisation. Parameters should be related to basic characterisation information, only a check on critical parameters (i.e. established, as determined in the basic characterisation), is necessary. The check has to show that the waste meets the limit values for the critical parameters.

The tests used for compliance testing shall be one or more of those used in the basic characterisation. The testing shall consist at least of a basic testing test. For this purpose the methods listed under section 3 shall be used.

Wastes that are exempted from the testing requirements for basic characterisation in section 1.1.4(a) and section 1.1.4(b) are also exempted from compliance testing. They will, however, need checking for compliance with basic characterisation information other than testing.

Compliance testing shall be carried out at least once a year and the operator must, in any event, ensure that compliance testing is carried out in the scope and frequency determined by basic characterisation.

Records of the test results shall be kept for a period that will be determined by the Member State.
1.3. On-site verification

Each load of waste delivered to a landfill shall be visually inspected before and after unloading. The required documentation shall be checked.

For waste deposited by the waste producer at a landfill in his control, this verification may be made at the point of disposal.

The waste may be accepted at the landfill, if it is the same as that which has been submitted to basic characterization and compliance testing and which is described in the accompanying document. If this is not the case, the waste must not be accepted.

Member States shall determine the testing requirements for on-site verification, including where appropriate rapid test methods.

Upon delivery, samples shall be taken periodically. The samples taken shall be kept after acceptance of the waste for a period that will be determined by the Member State, but not less than one month (see Article 14(b) of the Landfill Directive).

2. WASTE ACCEPTANCE CRITERIA

This section sets out the criteria for the acceptance of waste at each landfill, including criteria for underground storage.

In certain circumstances, up to three times higher limit values for specific parameters listed in this section (other than dissolved organic carbon (DOC) in sections 2.1.2.1, 2.1.2.2, 2.1.1.1 and 2.4.1, BTEX, PCBs and residual oil in section 2.1.2.2, total organic carbon (TOC) and pH in section 2.1.2 and less on gases H₂S and/or THC in section 2.1.2, and restricting the possible increase of the limit value for TOC in section 2.1.2 to only twice the limit value) may be acceptable if:

— the competent authority gives a permit for specified wastes on a case-by-case basis for the recipient landfill, taking into account the characteristics of the landfill and its surroundings; and

— emissions (excluding leachate) from the landfill, taking into account the limits for those specific parameters in this section, will present no additional risk to the environment according to a risk assessment.

Member States shall report to the Commission on the annual number of permits issued under this provision. The reports shall be sent to the Commission at intervals of three years as part of the reporting on the implementation of the Landfill Directive in accordance with the specifications laid down in Article 13 thereof.

Member States shall define criteria for compliance with the limit values set out in this section.

2.1. Criteria for landfills for inert waste

2.1.1. List of wastes acceptable at landfills for inert waste without testing

Wastes on the following list are deemed to fulfills the criteria as set out in the definition of inert waste in Article 2(a) of the Landfill Directive and the criteria listed in section 2.1.2. The wastes can be admitted without testing at a landfill for inert waste.

The waste must be a single stream (only one source) of a single waste type. Different wastes contained in the list may be accepted together, provided they are from the same source.

In case of suspicion of contamination (either from visual inspection or from knowledge of the origin of the waste) testing should be applied to the waste involved. If the listed wastes are contaminated or contain other materials (such as metals, asbestos, plastics, chemicals, etc.) or an element which increases the risk associated with the waste sufficiently to justify their disposal in other classes of landfills, they may not be accepted in a landfill for inert waste.

If there is a doubt that the waste fulfills the definition of inert waste according to Article 2(a) of the Landfill Directive and the criteria listed in section 2.1.2, or about the lack of contamination of the waste, testing must be applied. For this purpose the methods listed under section 3 shall be used.
<table>
<thead>
<tr>
<th>B/C code</th>
<th>Description</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1011 03</td>
<td>Waste glass-based fibreous materials</td>
<td>Only without organic binders</td>
</tr>
<tr>
<td>1501 07</td>
<td>Glass packaging/Glass</td>
<td></td>
</tr>
<tr>
<td>1701 01</td>
<td>Concrete</td>
<td>Selected C &amp; D waste only (*)</td>
</tr>
<tr>
<td>1701 02</td>
<td>Bricks</td>
<td>Selected C &amp; D waste only (*)</td>
</tr>
<tr>
<td>1701 03</td>
<td>Tiles and ceramics</td>
<td>Selected C &amp; D waste only (*)</td>
</tr>
<tr>
<td>1701 07</td>
<td>Mixtures of concrete, bricks, tiles and ceramics</td>
<td>Selected C &amp; D waste only (*)</td>
</tr>
<tr>
<td>1702 02</td>
<td>Glass</td>
<td></td>
</tr>
<tr>
<td>1704 04</td>
<td>Soil and stones</td>
<td>Excluding topsoil, peat, excluding soil and stones from contaminated sites</td>
</tr>
<tr>
<td>1912 05</td>
<td>Glass</td>
<td></td>
</tr>
<tr>
<td>2001 02</td>
<td>Glass</td>
<td>Separately collected glass only</td>
</tr>
<tr>
<td>2002 02</td>
<td>Soil and stones</td>
<td>Only from garden and parks waste. Excluding top soil, peat</td>
</tr>
</tbody>
</table>

(*) Selected construction and demolition waste C & D waste, with or without other types of materials (e.g. metal, plastic, soil, organs, wood, ruble, etc). The origin of the waste must be known.

- No C & D waste from construction, polluted with a organic or inorganic dangerous substance, e.g. because of production processes in the construction, soil pollution, sewage or sewage or other dangerous substances, etc., unless it is likely that the substantial construction was not significantly polluted.
- No C & D waste from construction, except covered or painted with materials containing dangerous substances in significant amounts.

Waste not appearing on this list must be subject to testing as laid down under section 1 to determine if it fulfills the criteria for waste acceptable at landfills for inert waste as set out in section 2.3.2.

2.1.2. Limit values for waste acceptable at landfills for inert waste

2.1.2.1. Leaching limit values

The following leaching limit values apply for waste acceptable at landfills for inert waste, calculated at liquid to solid ratio (L/S) of 2 kg and 10 L/kg for total release and directly expressed as mg/l for C5 and the first phase of precipitation test at L/S of 0.1. High محمول States shall determine which of the two methods (see section 3) and corresponding limit values in the table should be used.

<table>
<thead>
<tr>
<th>Component</th>
<th>US - 2 L/kg</th>
<th>US - 10 L/kg</th>
<th>C5 permeation test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/kg dry substance</td>
<td>mg/kg dry substance</td>
<td>mg/l</td>
</tr>
<tr>
<td>As</td>
<td>0.1</td>
<td>0.5</td>
<td>0.06</td>
</tr>
<tr>
<td>Ba</td>
<td>7</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>Cd</td>
<td>0.03</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Cr total</td>
<td>0.2</td>
<td>0.5</td>
<td>0.1</td>
</tr>
</tbody>
</table>

© Government of Gibraltar (www.gibraltarlaws.gov.gi)
### Landfill

<table>
<thead>
<tr>
<th>Component</th>
<th>L/1 ≤ 2 L/kg</th>
<th>L/1 &gt; 2 L/kg</th>
<th>C_{p} retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/l dry substance</td>
<td>mg/kg dry substance</td>
<td>mg/l</td>
</tr>
<tr>
<td>Cu</td>
<td>0.9</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Hg</td>
<td>0.005</td>
<td>0.02</td>
<td>0.002</td>
</tr>
<tr>
<td>Mo</td>
<td>0.3</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Ni</td>
<td>0.2</td>
<td>0.4</td>
<td>0.12</td>
</tr>
<tr>
<td>Pb</td>
<td>0.2</td>
<td>0.5</td>
<td>0.15</td>
</tr>
<tr>
<td>Sr</td>
<td>0.02</td>
<td>0.06</td>
<td>0.1</td>
</tr>
<tr>
<td>Se</td>
<td>0.06</td>
<td>0.1</td>
<td>0.04</td>
</tr>
<tr>
<td>Zn</td>
<td>2</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>Chloride</td>
<td>550</td>
<td>850</td>
<td>460</td>
</tr>
<tr>
<td>Fluoride</td>
<td>4</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td>Sulfate</td>
<td>560 (c)</td>
<td>1000 (c)</td>
<td>1500</td>
</tr>
<tr>
<td>TDS (*)</td>
<td>2.500</td>
<td>4.000</td>
<td>—</td>
</tr>
</tbody>
</table>

(*) If the mean does not fall within these values for sulphate, a tap will be considered to comply with the acceptance criteria if the leaching does not exceed either of the following values: 1.100 mg/l at L/1 ≤ 2 L/kg and 1.600 mg/l at L/1 > 2 L/kg. The leaching values must be adjusted to pH 7.5 and 4.0. The mean may be considered to comply with the acceptance criteria for DOC if the mean of this determination does not exceed 300 mg/l. A draft method based on pEN 14429 is available.

(*) The values for seed drained which (TD) can be used determinate to the values for sulphate and chloride.

---

2.1.2.1. Limit values for total content of organic parameters

In addition to the leaching limit values under section 2.1.2.1, leachates must meet the following additional limit values:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total organic carbon (TOC)</td>
<td>30 000 (*)</td>
</tr>
<tr>
<td>BTEX (benzene, toluene, ethylbenzene and xylene)</td>
<td>6</td>
</tr>
<tr>
<td>PCBs (polychlorinated biphenyls, 7 congeners)</td>
<td>1</td>
</tr>
<tr>
<td>Mineral oil (C10 to C40)</td>
<td>500</td>
</tr>
<tr>
<td>PAHs (polycyclic aromatic hydrocarbons)</td>
<td>Member States set limit value</td>
</tr>
</tbody>
</table>

(*) In the case of oils, a higher limit value may be selected by the competent authority, provided the DOC value of 300 mg/l is adhered to at L/1 ≤ 2 L/kg, either at the site own pH or a pH value between 7.5 and 4.0.
2.2. Criteria for landfills for non-hazardous waste

Member States may create subcategories of landfills for non-hazardous waste.

In this Annex limit values are laid down only for non-hazardous waste, which is landfilled in the same cell with stable, non-reactive hazardous waste.

2.2.1. Waste acceptable as landfills for non-hazardous waste without testing

Municipal waste as defined in Article 266 of the Landfill Directive that is classified as non-hazardous in Chapter 20 of the European waste list, separately collected non-hazardous fractions of household wastes and the same non-hazardous materials from other origins can be admitted without testing at landfills for non-hazardous waste.

The waste may not be admitted if they have not been subjected to prior treatment according to Article 66 of the Landfill Directive, or if they are contaminated to an extent which increases the risk associated with the waste sufficiently to justify their disposal in other landfill.

They may not be accepted in cells where stable, non-reactive hazardous waste is accepted pursuant to Article 69(1)(b) of the Landfill Directive.

2.2.2. Limit values for non-hazardous waste

The following limit values apply to municipal non-hazardous waste accepted in the same cell as stable, non-reactive hazardous waste, calculated at USE-2 and 10 Hg for total releases and directly expressed as mg/l for C (in the first choice of precipitation test at US = 0.11 kg). Municipal waste include all wastes that are not recycable.

Member States shall determine which of the test methods (see section 3) and corresponding limit values in the table below shall be used.

<table>
<thead>
<tr>
<th>Compositions</th>
<th>USE-2 Hg</th>
<th>USE-10 Hg</th>
<th>C (precipitation test)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/kg dry substance</td>
<td>mg/kg dry substance</td>
<td>mg/l</td>
</tr>
<tr>
<td>As</td>
<td>0.4</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td>Ba</td>
<td>30</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Cl</td>
<td>0.6</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Cu</td>
<td>4</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td>Hg</td>
<td>25</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Mo</td>
<td>5</td>
<td>10</td>
<td>3.5</td>
</tr>
<tr>
<td>Pb</td>
<td>5</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Pb</td>
<td>5</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Sn</td>
<td>0.2</td>
<td>0.7</td>
<td>0.15</td>
</tr>
<tr>
<td>Sr</td>
<td>0.3</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Zn</td>
<td>25</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>Chloride</td>
<td>10,000</td>
<td>15,000</td>
<td>8,500</td>
</tr>
</tbody>
</table>
2.2.3. Gypsum waste

Non-hazardous gypsum-based materials should be disposed of only in landfills for non-hazardous waste in cells where no biodegradable waste is accepted. The limit values for TDS and DOC given in sections 2.2.2 and 2.3.1 shall apply to waste landfilled together with gypsum-based materials.

2.3. Criteria for hazardous waste acceptable as landfill for non-hazardous waste pursuant to Article 6(6)(ii)

Stable, non-reactive means that the leaching behaviour of the waste will not change adversely in the long-term, under landfill design conditions or foreseeable accidents:

— in the waste alone (for example, by biodegradation);

— under the impact of long-term ambient conditions (for example, water, air, temperature, mechanical constraints);

— by the impact of other wastes (including waste products such as leachate and gas).

2.3.1. Leaching limit values

The following leaching limit values apply to granular hazardous waste acceptable as landfill for non-hazardous waste, calculated at US = 2 and 10 kg for total release and directly expressed as CMT for C0 (the first stage of leaching test at US = 0.1 kg). Granular wastes include all wastes that are not monolithic. Member States shall determine which of the test methods and corresponding limit values should be used.

<table>
<thead>
<tr>
<th>Component</th>
<th>US = 2 kg</th>
<th>US = 10 kg</th>
<th>C0 (gravel fraction)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/kg dry substrate</td>
<td>mg/kg dry substrate</td>
<td>mg/l</td>
</tr>
<tr>
<td>arsenic</td>
<td>0.4</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td>barium</td>
<td>30</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>cadmium</td>
<td>0.6</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>heavy metal total</td>
<td>4</td>
<td>10</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Note: The values for TDS can be used alternatively to the values for sulphate and chloride.

Member States shall set criteria for monolithic waste to provide the same level of environmental protection given by the above limit values.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOC (total organic carbon)</td>
<td>5% (%)</td>
</tr>
<tr>
<td>pH</td>
<td>Minimum 6</td>
</tr>
<tr>
<td>ANC (acid neutralisation capacity)</td>
<td>Must be evaluated</td>
</tr>
</tbody>
</table>

(*) If the value is not achieved, a higher limit value may be obtained by the competent authorities, provided that the DOC value of 100 mg/l is achieved at a pH of 6-8 and as the material's pH is between 7.3 and 10.6.

Member States must set criteria to ensure that the waste will have sufficient physical stability and bearing capacity.

Member States shall set criteria to ensure that hazardous municipal wastes are stable and non-reactive before acceptance in landfills for non-hazardous waste.
2.3.3. Asbestos waste

Construction materials containing asbestos and other suitable asbestos waste may be landfilled at landfills for non-hazardous waste in accordance with Article 69(b)(i) of the Landfill Directive without testing.

For landfills accepting construction materials containing asbestos and other suitable asbestos waste the following requirements must be fulfilled:

— the waste contains no other hazardous substances than bond asbestos, including fibres bound in a binding agent or packed in plastic;
— the landfill accepts only construction material containing asbestos and other suitable asbestos waste. These wastes may also be landfilled in a separate cell of a landfill for non-hazardous waste, if the cell is sufficiently self-contained;
— in order to avoid dispersion of fibres, the pace of deposit is covered daily and before each compacting operation with appropriate material and, if the waste is not packed, it is regularly spreaded;
— a final top cover is put on the landfill cell in order to avoid the dispersion of fibres;
— no works are carried out on the landfill cell that could lead to a release of fibres (e.g. drilling of holes);
— after closure a plan is kept of the location of the landfill cell indicating that asbestos wastes have been deposited;
— appropriate measures are taken to limit the possible uses of the land after closure of the landfill in order to avoid human contact with the waste.

For landfills accepting only construction material containing asbestos, the requirements set out in Annex 1 point 3.2 and 3.3 of the Landfill Directive can be reduced, if the above requirements are fulfilled.

2.4. Criteria for waste acceptable as landfills for hazardous waste

2.4.1. Landfill limit values

The following leaching limit values apply for granular waste acceptable as landfills for hazardous waste, calculated as L 1 ≤ 2 and 10 mg/kg total release and directly expressed in mg/l for C (the first column of production test at L 0 1 ≤ 0.1 mg/kg). Granular waste include all wastes that are not mortarable. Member States shall determine which of the test methods and corresponding limit values in the table should be used.

<table>
<thead>
<tr>
<th>Component</th>
<th>L 0 1 ≤ 2 mg/kg</th>
<th>L 0 1 ≤ 10 mg/kg</th>
<th>C (pollution unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/kg dry substance</td>
<td>mg/kg dry substance</td>
<td>mg/l</td>
</tr>
<tr>
<td>As</td>
<td>6</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>Ba</td>
<td>100</td>
<td>300</td>
<td>60</td>
</tr>
<tr>
<td>Cl</td>
<td>3</td>
<td>3</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>70</td>
<td>15</td>
</tr>
<tr>
<td>Cr</td>
<td>60</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>Hg</td>
<td>0.5</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Mo</td>
<td>20</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>Ni</td>
<td>20</td>
<td>40</td>
<td>12</td>
</tr>
<tr>
<td>Pb</td>
<td>25</td>
<td>50</td>
<td>15</td>
</tr>
</tbody>
</table>

© Government of Gibraltar (www.gibraltarlaws.gov.gi)
### Table

<table>
<thead>
<tr>
<th>Component</th>
<th>leq - 2 (\text{t}^{-1})</th>
<th>leq - 10 (\text{t}^{-1})</th>
<th>C (recommended max)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/kg dry substance</td>
<td>mg/kg dry substance</td>
<td>mg/l</td>
</tr>
<tr>
<td>Si</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Sc</td>
<td>4</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Zn</td>
<td>90</td>
<td>200</td>
<td>60</td>
</tr>
<tr>
<td>Chloride</td>
<td>17 000</td>
<td>25 000</td>
<td>15 000</td>
</tr>
<tr>
<td>Fluoride</td>
<td>200</td>
<td>500</td>
<td>120</td>
</tr>
<tr>
<td>Sulfate</td>
<td>25 000</td>
<td>50 000</td>
<td>17 000</td>
</tr>
<tr>
<td>DOC (*)</td>
<td>480</td>
<td>1 000</td>
<td>320</td>
</tr>
<tr>
<td>TDS (**)</td>
<td>70 000</td>
<td>100 000</td>
<td>—</td>
</tr>
</tbody>
</table>

(*) If the water does not meet these values for DOC in an even pH, it may alternatively be tested at leq - 10 \(\text{t}^{-1}\) and a pH of 7.5-8.0. The waste may be considered as complying with the acceptance criteria for DOC, if the result of this determination does not exceed 1 000 mg/litre. A draft method based on pH 7.14429 is available.

(**) The value for TDS can be used interchangeably to the value for sulphate and chloride.

Member States shall set criteria for non-hazardous waste to provide the same level of environmental protection given by the above limit values.

### 2.4.2. Other criteria

In addition to the leaching limit values under section 2.4.1, hazardous wastes must meet the following additional criteria:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOI (*)</td>
<td>10 %</td>
</tr>
<tr>
<td>TOC (*)</td>
<td>0 % (**)*</td>
</tr>
<tr>
<td>ANC (acid neutralization capacity)</td>
<td>Must be evaluated</td>
</tr>
</tbody>
</table>

(*) Either DOC or TOC must be met.

(**) If this value is not achieved, a higher limit value may be obtained by the competent authority, provided that the DOC value of 1 000 mg/litre is achieved in leq - 10 \(\text{t}^{-1}\) either in the material's own pH or at a pH value between 7.2 and 8.0.

### 2.5. Criteria for underground storage

For the acceptance of waste in underground storage sites, a site-specific safety assessment as defined in Annex A must be carried out. Waste may be accepted only if it is compatible with the site-specific safety assessment.

At underground storage sites for inert waste, only waste that fulfills the criteria set out in section 2.3 may be accepted.

At underground storage sites for non-hazardous waste, only waste that fulfills the criteria set out in section 2.2 or in section 2.3 may be accepted.

At underground storage sites for hazardous waste, waste may be accepted only if it is compatible with the site-specific safety assessment. In this case, the criteria set out in section 2.4 do not apply. However, the waste must be subject to the acceptance procedure as set out in section 2.1.
3. SAMPLING AND TEST METHODS

Sampling and testing for basic characterization and compliance testing shall be carried out by independent and qualified persons and institutions. Laboratories shall have proven experience in waste testing and analysis and an efficient quality assurance system.

Member States may decide that:

1. the sampling may be carried out by producers of waste or operators under the condition that sufficient supervision of independent and qualified persons or institutions ensures that the objectives set out in this Decision are achieved;

2. the testing of the waste may be carried out by producers of waste or operators if they have set up an appropriate quality assurance system including periodic independent checking.

As long as a CEN standard is not available as formal EN, Member States will use either national standards or procedures or the draft CEN standard, when it has reached the prEN stage.

The following methods shall be used:

Sampling

For the sampling of waste — for basic characterization, compliance testing and on-site verification testing — a sampling plan shall be developed according to part 1 of the sampling standard currently developed by CEN.

General waste properties

- EN 13313: Determination of TOC in waste, sludge and sequesters
- prEN 14446: Determination of dry matter by determination of dry residue or water content

Leaching tests

- prEN 14465: Leaching behaviour test - Upflow percolation test (Upflow percolation test for inorganic components)
- EN 12457: Leaching — Corrosion test for leaching of granular waste materials and sludges
  - Part 1: L5= 2.5 kg, particle size < 4 mm
  - Part 2: L5= 5.0 kg, particle size < 4 mm
  - Part 3: L5= 2.0 and 2.8 kg, particle size < 4 mm
  - Part 4: L5= 10.0 kg, particle size < 10 mm

Digestion of raw waste

- EN 13357: Digestion for subsequent determination of organo-metallic volatile portion of elements (spatial digestion of the solid waste prior to elementary analysis, leaching the chloric matrix matrix)
- EN 13656: Microwave-assisted digestion with hydrofluoric (HF), nitric (HNO3) and hydrochloric (HCl) acid mixture for subsequent determination of elements (solid digestion of the solid waste prior to elementary analysis)

Analysis

- EN 12505: Analysis of elements — Determination of pH, As, Ba, Ca, Cl, Co, Cr, Cu, Fe, K, Mg, Mn, Ni, NOx, Pb, total Hg, Pb-V and Zn (analysis of inorganic constituents of solid waste and/or in leachate, matrix, mirex, matrix and mirex elements)
- EN 13870: Analysis of elements — Determination of ammonium, AOX, conductivity, Hg, phenol index, TOC, easily leachable CN, F (analysis of inorganic constituents of solid waste and/or in leachate matrix)

prEN 14039: Determination of hydrocarbon content in the range of C10 to C40 by gas chromatography

This list will be amended when more CEN standards are available.

For tests and analyses, for which CEN methods are not yet available, the methods used must be approved by the competent authorities.
Appendix A

SAFETY ASSESSMENT FOR ACCEPTANCE OF WASTE IN UNDERGROUND STORAGE

1. SAFETY PHILOSOPHY FOR UNDERGROUND STORAGE - ALL TYPES

1.1. The importance of the geological barrier

Isolation of wastes from the biosphere is the ultimate objective for the final disposal of wastes in underground storage. The reason, the geological barrier and the cordon, including any engineered structure constitute a system that together with all other technical aspects must fulfill the corresponding requirements.

The requirements of the Water Framework Directive (2000/60/EC) can be fulfilled only by demonstrating the long-term safety of the installation (see section 1.2.7). Article 11(1)(d) of Directive 2000/60/EC generally prohibits the direct discharge of pollutants into groundwater. Article 11(1)(e) of Directive 2000/60/EC requires Member States to take measures to prevent the deterioration of the status of all bodies of groundwater.

1.2. Site-specific risk assessment

The assessment of risk requires the identification of:
- the barrier (in this case the deposited wastes),
- the receptors (in this case the biosphere and possibly groundwater),
- the pathways by which substances from the wastes may reach the biosphere, and
- the assessment of impact of substances that may reach the biosphere.

Acceptance criteria for underground storage are to be derived from, inter alia, the analysis of the host rock, so it must be confirmed that no water-related condition specified in Annex I to the Landfill Directive (with the exception of Annex I(2)(c), (d), (f) and (n)) are of relevance.

The acceptance criteria for underground storage can be obtained only by referring to the local conditions. This requires a demonstration of the suitability of the strata for establishing a storage, i.e., assessment of the risks to containment, taking into account the overall system of the waste, engineered structures and cordon and the host rock's body.

The site-specific risk assessment of the installation must be carried out for both the operational and post-operational phases. For these assessments, the required control and safety measures can be derived and the acceptance criteria can be developed.

An integrated performance assessment analysis shall be prepared, including the following components:
1. geological assessment;
2. geochemical assessment;
3. hydrogeological assessment;
4. geotechnical assessment;
5. biosphere impact assessment;
6. assessment of the operational phase;
7. long-term assessment;
8. assessment of the impact of all the surface facilities at the site.

1.2.1. Geophysical assessment

A thorough investigation of knowledge of the geological setting of a site is required. This includes investigations and analyses of kind of rocks, soils and the topology. The geological assessment should demonstrate the suitability of the site for underground storage. The location, frequency and structure of any faulting or fracturing in surrounding geological units and the potential impact of seismic activity on these structures should be included. Alternative site locations should be considered.
1.2.2. Geotechnical assessment

The stability of the cavities must be demonstrated by appropriate investigations and predictions. The deposited waste must be part of this assessment. The processes should be analysed and documented in a systematic way.

The following should be demonstrated:
1. that during and after the formation of the cavities no major deformation is to be expected either in the cavity itself or at the earth surface which could impair the operability of the underground storage or provide a pathway to the biosphere;
2. that the load-bearing capacity of the cavity is sufficient to prevent its collapse during operation;
3. that the deposited material meets the necessary stability compatible with the geo-mechanical properties of the host rock.

1.2.3. Hydrogeological assessment

A thorough investigation of the physical properties is required to assess the groundwater flow pattern in the surrounding area based on information on the hydraulic conductivity of the rock mass, structure and the hydraulic gradients.

1.2.4. Geophysical assessment

A thorough investigation of the rock and the groundwater composition is required to assess the potential ground-water composition and its potential evolution over time, the nature and abundance of formation filling materials, as well as a quantitative mineralogical description of the host rock. The impact of variability on the geochronological system should be assessed.

1.2.5. Biospheric impact assessment

An investigation of the biosphere that could be impacted by the underground storage is required. Baseline studies should be performed to define local natural background levels of relevant substances.

1.2.6. Assessment of the operational phase

For the operational phase, the analysis should demonstrate the following:
1. the stability of the cavities as in section 1.2.2;
2. no unacceptable risk of a pathway developing between the waste and the biosphere;
3. no unacceptable risks affecting the operation of the facility.

When demonstrating operational safety, a systematic analysis of the operation of the facility must be made on the basis of specific data on the waste inventory, facility management and the scheme of operation. It is to be shown that the waste will not react with the rock in any chemical or physical way which could impair the strength and rigidity of the rock and endanger the storage itself. For these reasons, in addition to wastes that are banned by Article 5(6) of the Landfill Directive, wastes that are liable to spontaneous combustion under the storage conditions (temperature, humidity, oxygen content, volatile waste/waste coming from collections in the form of unidentified materials should not be accepted.

Particular attention should be paid to the development of a pathway between the waste and the biosphere in the operational phase should be identified. The different types of potential operational risks should be identified in specific compartments. Their possible effects should be evaluated. It should be shown that there is an acceptable risk that the containment of the operation will be breached. Contingency measures should be provided.

1.2.7. Long-term assessment

In order to comply with the objectives of sustainable landfilling, risk assessment should cover the long-term. It must be ascertained that no pathways to the biosphere will be generated during the long-term post-operation of the underground storage.
The barriers of the underground storage site (e.g. the waste quality, engineered structures, backfilling and sealing of shafts and ditches), the performance of the host rock, the surrounding rocks and the seawater should be quantitatively assessed over the long-term and evaluated on the basis of site-specific data or uniformly conservative assumptions. The geohydrological conditions such as groundwater flow (see sections 1.2.3 and 1.2.4), barrier efficiency, natural attenuation as well as leakage of the deposited wastes should be taken into consideration.

The long-term safety of an underground storage should be demonstrated by a safety assessment comprising a description of the initial status at a specified time (e.g. time of closure) followed by a scenario outlining its potential changes that are expected over geological time. Finally, the consequences of the release of relevant substances from the underground storage should be assessed for different scenarios reflecting the possible long-term evolution of the biosphere, geosphere and the underground storage.

Containers and Carrier lining should not be taken into account when assessing the long-term risks of waste deposits because of their limited lifetime.

1.2.8. Impact assessment of the surface reception facilities

Although the wastes taken at the site may be destined for subsurface disposal, wastes will be unloaded, treated and possibly stored on the surface, before reaching their final destination. The reception facilities must be designed and operated in a manner that will prevent harm to human health and the local environment. They must fulfill the same requirements as any other waste reception facility.

1.2.9. Assessment of other risks

For reasons of protection of workers, wastes should be deposited only in an underground storage securely separated from mixing activities. Waste should not be accepted if it contains or could generate hazardous substances which might harm human health, e.g. pathogenic germs of communicable diseases.

2. ACCEPTANCE CRITERIA FOR UNDERGROUND STORAGE ALL TYPES

2.1. Excluded wastes

In the light of sections 1.2.1 to 1.2.8, wastes that may undergo undesired physical, chemical or biological transformation after they have been deposited must not be disposed of in underground storage. This includes the following:

(a) wastes listed in Article 5(3) of the Landfill Directive;
(b) wastes and their containers which might react with water or with the host rock under the storage conditions and lead to:
   — a change in the volume;
   — generation of non-flammable or toxic or explosive substances or gases;
   — any other reactions which could endanger the operational safety and/or the integrity of the barrier;
(c) wastes which might react with each other must be defined and classified in groups of compatibility; the different groups of compatibility must be physically separated in the storage;
(d) wastes that are biodegradable;
(e) wastes that have a pungent smell;
(f) wastes that can generate a gas-air mixture which is toxic or explosive. This particularly refers to wastes that:
   — cause toxic gas concentrations due to the partial pressures of their components;
   — form combustible gases when saturated within a container, which are higher than 10% of the concentration which corresponds to the lower explosive limit;
(g) wastes with insufficient stability to correspond to the geomechanical conditions;
(h) wastes that are auto-flammable or liable to spontaneous combustion under the storage conditions, gaseous products, volatile wastes, wastes coming from collections in the form of unlabelled substances;
(i) wastes that contain, or could generate, pathogenic germs of communicable diseases (already provided for by Article 5(3)(b) of the Landfill Directive).
2.2. List of waste suitable for underground storage

Hazardous and non-hazardous wastes not excluded by sections 2.1 and 2.2 may be suitable for underground storage.

Member States may produce lists of wastes acceptable at underground storage facilities in accordance with the criteria given in Article 4 of the Landfill Directive.

2.3. Site-specific risk assessment

Acceptance of waste at a specific site must be subject to site-specific risk assessment.

The site-specific assessment outlined in section 1.2 for the waste to be accepted at an underground storage should demonstrate that the level of isolation from the biosphere is acceptable. The criteria have to be fulfilled under storage conditions.

2.4. Acceptance conditions

Wastes can be deposited only in an underground storage securely separated from mining activities.

Wastes that may react with each other must be defined and classified in groups of compatibility; the different groups of compatibility must be physically separated in the storage.

3. ADDITIONAL CONSIDERATIONS: SALT MINES

3.1. Importance of the geological barrier

In the safety philosophy for salt mines, the rock surrounding the waste has a two-fold role:

— it acts as host rock in which the wastes are encapsulated;

— together with the overlying and underlying impermeable rock strata, it forms a geological barrier intended to prevent groundwaters entering the landfill and, where necessary, effectively to stop liquids or gases escaping from the disposal area. Where this geological barrier is breached by shafts and tunnels, these must be sealed during operation to ensure against ingress of water, and must be systematically closed off the underground landfill areas to operate. If mineral extraction continues longer than the landfill operation, the disposal area must, after the landfill has ceased operation, be sealed with a technically impermeable dam, which is constructed according to the calculated hydrostatically operative pressure corresponding to the depth, so that water which may seep into the self-sealing operating mine cannot penetrate through to the landfill area.

— in salt mines, the salt is considered to provide total containment. The wastes will only make contact with the biosphere in the case of an accident or an event in geological time such as earth movement or erosion (e.g., associated with soil subsidence). The waste is unlikely to change in storage, and the consequences of such failure scenarios must be considered.

3.2. Long-term assessment

The demonstration of long-term safety of underground disposal in a salt rock should be principally undertaken by designing the salt rock as the barrier rock. Salt rock fills the requirement of being impermeable to gases and liquids, of being able to encase the waste because of its convergent behaviour and of containing it entirely at the end of the transmutation process.

The convergent behaviour of the salt rock thus does not contravene the requirement to have stable cavities in the operation phase. The stability is important, in order to guarantee the operational safety and in order to maintain the integrity of the geological barrier over unlimited time, so that there is continuous protection of the biosphere. The wastes should be isolated permanently from the biosphere. Controlled subsidence of the overburden or other defects over long time are acceptable only if it can be shown, that only impervious materials will occur, the integrity of the geological barrier is maintained and no pathways are formed by which water would be able to contact the wastes or the wastes or components of the waste migrate to the biosphere.

4. ADDITIONAL CONSIDERATIONS: HARD ROCK

Deep storage in hard rock is here defined as an underground storage at several hundred metres depth, where hard rock includes various igneous rocks, e.g. granite or gneiss, it may also include sedimentary rocks, e.g. limestone and sandstone.
4. Safety philosophy

A deep storage in hard rock is a feasible way to avoid burdening future generations with the responsibility of the waste since it should be constructed to be passive and with no need for maintenance. Furthermore, the construction should not obstruct recovery of the site or the ability to undertake future corrective measures. It should also be designed to ensure that negative environmental effects or liabilities resulting from the activities of present generations do not fall upon future generations.

In the safety philosophy of underground disposal of wastes, the main concept is isolation of the waste from the biosphere, as well as natural attenuation of any pollutants leaching from the waste. For certain types of hazardous substances and wastes, a need has been identified to protect the society and the environment against sustained exposure over extended periods of time. An extended period of time implies several thousand years. Such levels of protection can be achieved by deep storage in hard rock. A deep storage for waste in hard rock can be located either in a former mine, where the mining activities have come to an end, or in a new storage facility.

In the case of hard-rock storage, total containment is not possible. In this case, an underground storage needs to be constructed so that natural attenuation of the surrounding media reduces the effect of pollutants to the extent that they have no irreversible negative effects on the environment. This means that the capacity of the environment to attenuate and degrade pollutants will determine the acceptability of a release from such a facility.

The requirements of the EU Water Framework Directive (2000/60/EC) can only be fulfilled by demonstrating the long-term safety of the installation (see section 1.2.7). The performance of a deep storage system must be assessed in a holistic way, accounting for the coherent function of different components of the system. In a deep storage in hard rock, the storage will reside below the groundwater table. Article 11(1)(b) of the Directive generally prohibits the direct discharge of pollutants into groundwater. Article 40(6)(b) of the Directive requires Member States to take measures to prevent the deterioration of the status of all bodies of groundwater. For a deep storage in the hard rock, this requirement is respected in that any discharges of hazardous substances from the storage will not reach the biosphere, including the upper parts of the groundwater system accessible for the biosphere, in amounts or concentrations that will cause adverse effects. Therefore, the waste flow paths to and in the biosphere should be evaluated. The impact of variability of the geohydrologic system should be assessed.

Gas formation may occur in deep storage in hard rock due to long-term dissipation of waste, packaging, and engineered structures. Therefore, this must be considered in the design of permits for a deep storage in hard rock.

Underground storage

Alternatively, the waste may be stored against the criteria for underground storage. If the criteria are met, the waste may go to an underground storage facility for hazardous waste (Landfill class 3). If the underground storage criteria are not met, the waste may be subjected to further treatment and stored again.

Although underground storage is likely to be required for special hazardous wastes, this subcategory may in principle be used also for inert waste (class 3 inert) and non-hazardous waste (class 3 non-hazardous).
Figure 1
Diagram showing the landfill options provided by the Landfill Directive

WASTE TO BE LANDFILLED (some treatment implied)

- Is the waste hazardous?
  - Yes: Are the criteria for placement of non-hazardous waste in landfill for non-hazardous waste met?
  - No: No further treatment
- No: Is the waste inert?
  - Yes: Is the waste inert with low organic content?
  - No: If it is a mixture of organic and inorganic waste

A
- Landfill for inert waste (*)
- Landfill for non-hazardous waste (*)
  - Subcategories for non-hazardous waste with hazardous waste content specified in the specific criteria may apply

B1
- Landfill for non-hazardous waste (*)
  - Subcategories for non-hazardous waste with hazardous waste content specified in the specific criteria may apply

B2
- Landfill for non-hazardous waste (*)

B3
- Landfill for non-hazardous waste (*)

C
- Hazardous waste landfill (*)
  - The waste may be stored on land or underground storage site for non-hazardous waste (*)

( *) In principle, underground storage is also possible for inert and non-hazardous waste.

© Government of Gibraltar (www.gibraltarlaws.gov.gi)
Table 1

<table>
<thead>
<tr>
<th>Landfill class</th>
<th>Major subcategories (underground storage facilities, monofills and landfills for solidified, monolithic (*)) waste possible for all landfill classes)</th>
<th>ED</th>
<th>Acceptance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfill for inert waste</td>
<td>Landfill accepting inert waste</td>
<td>A</td>
<td>Criteria for leaching and release of organic components are set at EU level (sections 2.1.3). Criteria for leaching and release of inorganic components may be set at Member State level.</td>
</tr>
<tr>
<td>Landfill for non-hazardous waste</td>
<td>Landfill for inorganic non-hazardous waste with a low content of organic/ biodegradable matter, where the waste does not meet the criteria set out in section 2.2.1 for those inorganic, non-hazardous wastes that may be landfilled together with non-hazardous waste.</td>
<td>B1</td>
<td>Criteria for leaching and release of organic and other properties set at EU level, common for granular non-hazardous waste and for stable, non-reactive hazardous waste (section 2.2). Additional stability criteria for the latter are to be set at Member State level. Criteria for monolithic waste must be set at Member State level.</td>
</tr>
<tr>
<td>Landfill for organic non-hazardous waste</td>
<td>Landfill for inorganic non-hazardous waste with a low content of organic/biodegradable matter</td>
<td>B2</td>
<td>Criteria for leaching and release of organic and other properties set at EU level, common for granular non-hazardous waste and for stable, non-reactive hazardous waste (section 2.2). Additional stability criteria for the latter are to be set at Member State level. Criteria for monolithic waste must be set at Member State level.</td>
</tr>
<tr>
<td>Landfill for mixed non-hazardous waste with substantial content of both organic/biodegradable waste and inorganic waste.</td>
<td>Landfill for mixed non-hazardous waste with substantial content of both organic/biodegradable waste and inorganic waste.</td>
<td>B3</td>
<td>Criteria for leaching and release of organic and other properties set at EU level, common for granular non-hazardous waste and for stable, non-reactive hazardous waste (section 2.2). Additional stability criteria for the latter are to be set at Member State level. Criteria for monolithic waste must be set at Member State level.</td>
</tr>
<tr>
<td>Landfill for hazardous waste</td>
<td>Surface landfill for hazardous waste</td>
<td>C</td>
<td>Criteria for leaching for granular hazardous waste and total content of organic components have been laid down at EU level (section 2.4). Criteria for monolithic waste must be set at Member State level. Additional criteria on content of contaminants can be set at MS level.</td>
</tr>
<tr>
<td>Underground storage site</td>
<td>$D_{agg}$</td>
<td></td>
<td>Special requirements at EU level are listed in Annex A.</td>
</tr>
</tbody>
</table>

(*) Monolithic waste subcategories are only criteria for B1, C and $D_{agg}$ and possibly A.
SCHEDULE 5
TREATMENT REQUIREMENTS

Section 5(2D)

1. Treatment shall, as a minimum, include removal of all fluids and acids.

2. Treatment and any storage, including temporary storage, at treatment facilities shall take place in sites with impermeable surfaces and suitable weatherproof covering or in suitable containers.