

COMMISSION OF THE EUROPEAN COMMUNITIES

COM93)275 final SYN 335

Brussels, 10 June 1993

Amended proposal for a

COUNCIL DIRECTIVE

on the landfill of waste

(presented by the Commission pursuant to Article 149(3)
of the EEC-Treaty)

EXPLANATORY MEMORANDUM

Pursuant to article 149(3) of the EEC Treaty, the Commission submits an amended proposal for a Council Directive on the Landfill of Waste⁽¹⁾. The amended proposal takes account of a number of amendments by the European Parliament adopted at its May and October 1992 Plenary Session and by the Economic and Social Committee⁽²⁾.

In particular, the Commission has included an additional reference to the polluter pays principle because of the growing concern of old landfill site remediation and development of training of landfill personnel (cfr recitals 16 and 17 respectively and art. 16 and 20a).

The Commission has also sought to clarify the wording of definitions in article 3 and to add further requisites regarding the application, the conditions and the content of the permit (cfr art. 6, 7, 8).

Following adoption by the Council of Directive 91/689/EEC on hazardous waste, the Commission has accepted Parliament's proposal for an additional reference in Article 9. In the same article, the Commission has also sought to ensure that no method should be used to try to meet the standards foreseen in this directive by means of dilution or mixing of the wastes.

The Commission has accepted Parliament's amendment to ban joint disposal (cfr art. 10.5) introducing a transitional period of 5 years for those countries where it is currently legally practised, and in the same article to clarify the type of wastes that can be deposited into a monolandfill.

In addition the Commission accepted Parliament's proposal to reinforce article 11, particularly concerning the case of non acceptance of the waste, and article 13, concerning the procedures for closure and monitoring after the closure of the site.

The Commission has also incorporated Parliament's amendment to clarify the period within which existing landfill sites have to comply with the terms of this directive (cfr art. 15) and the procedures to follow.

Beyond this, the Commission has accepted Parliament's proposal to detail the information of annual reports which Member States are required to submit in accordance with article 19 and Annex IVa.

Finally, the Commission has accepted in part some of the amendments concerning the annexes, especially the ones dealing with the control of access to the landfill and landfill gas management.

(1) OJ N° C 190, 22.7.91, p. 1

(2) OJ N° C 40, 17.2.92, p. 112 et seq.

The Commission also finally decided not to amend the proposal concerning insurance coverage at the moment, because it prefers to tackle this problem within the general framework designed by the Green Paper on remedying environmental damage.

Amendments regarding the banning of the disposal of liquid wastes into landfills have been rejected by the Commission. The Commission is of the opinion that, as liquid waste needs to be disposed of, and, if it is compatible with the type of wastes acceptable in each individual landfill, landfill can be a good alternative to incineration, when the location of the landfill and the climate conditions allow it.

The Commission rejected a number of amendments concerning the functioning of the landfill, because they refer to specific techniques which are already incorporated in the general demands laid down in the directive. It is for Member States to fix more specific standards corresponding to the results of the environmental impact assessment.

As for the amendments concerning the concepts of prevention and recycling: the Commission is aware of their importance for the reduction of the waste flow in general. However, this is not the objective of the present directive.

Furthermore, the amendments concerning a programme of sampling and analysis of all the wastes arriving at the landfill have been rejected by the Commission, since such operations are not always considered necessary; for urban waste for example, the supervision aspect has been taken into consideration in Annex III, and for waste with homogeneous characteristics which arrives periodically in large quantities (for example waste coming from frequent users of the landfill in the sense of the directive), sampling and analysis are considered not to be necessary either.

Finally, the Commission rejected the proposed compromise amendment which asks for a report of the work of the Technical Committee including a record of all Committee meetings, since its proposal is in accordance with the Council Decision of July 1987 laying down the procedures for the exercise of implementing powers conferred on the Commission.

Amended proposal for a
COUNCIL DIRECTIVE
on the landfill of waste

ORIGINAL TEXT

AMENDED TEXT

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100a thereof,

Having regard to the proposal from the Commission,

In cooperation with the European Parliament,

Having regard to the opinion of the Economic and Social Committee,

Whereas the resolution of the Council of 7 May 1990 on waste policy ⁽¹⁾ adopts the Community strategy document and invites the Commission to propose criteria and standards for disposal of waste by landfill;

Whereas there is a need, in a Community without internal frontiers, to harmonize the technical standards for the landfill of waste on a high level of environmental protection;

Whereas it is considered necessary to take the appropriate measures to avoid the abandonment, dumping or uncontrolled disposal of waste;

Whereas disparities between technical standards for the disposal of waste by landfill might give rise to preferential disposal of waste in facilities with low standards of environmental protection, where disposal costs are inferior, and thus create a potentially serious threat to the environment, due to unnecessarily long transport of the wastes as well as to inappropriate disposal practices;

Whereas any disparity between the laws and technical standards of the Member States on the landfill of waste can distort the conditions of competition and thereby directly affect the establishment and functioning of the internal market;

Whereas the disparity between technical standards and control and operating procedures in landfills gives rise to differences in the cost of waste disposal and thus affects the conditions of competition;

⁽¹⁾ OJ No C 122, 18. 5. 1990, p. 2.

Whereas in view of what is said above it is necessary to clearly define the classes of landfill to be considered and the types of waste to be accepted in the different classes of landfill;

Whereas it is necessary to clearly point out which are the general requirements with which landfills must comply, dealing with location, development, control and protective measures to be taken, in particular against the pollution of groundwater by leachate infiltration into the soil;

Whereas it is necessary to harmonize the permit procedures for all classes of landfills according to the general licensing requirements already set down in Council Directive 75/442/EEC of 15 July 1975 ⁽²⁾ on waste, as amended by Directive 91/156/EEC ⁽³⁾, and to the particular aspects of landfill as required in this Directive;

Whereas it is necessary to avoid disparities in the waste acceptance procedures in different landfills, and for this a homogeneous system of waste sampling, characterization and analysis will have to be fixed;

Whereas it is necessary to establish common control procedures during the operation and aftercare phases of a landfill in order to identify any possible adverse environmental effect of the landfill and take the appropriate corrective measures;

Whereas it is necessary to define when and how a landfill should be closed and the obligations of the operator on the site during the aftercare period;

Whereas it is necessary to regulate the conditions in which existing landfills shall operate and the measures to be taken for their adaptation to the conditions laid down in this Directive;

Whereas an old operating site should be corrected as far as possible in order to mitigate its possible negative environmental impact;

Whereas in compliance with the 'polluter pays' principle the price charged for waste disposal in a landfill shall cover at least all the costs involved in the setting up, operation and aftercare of the facility;

Whereas the polluter pays principle requires as a minimum that damage to the environment produced by a landfill is adequately taken care of and that the operators of landfill sites have sufficient financial guarantees to support any necessary remedial actions;

⁽²⁾ OJ No L 194, 25. 7. 1975, p. 39.

⁽³⁾ OJ No L 78, 26. 3. 1991, p. 32.

Whereas it is necessary to ensure the proper operation of the provisions implementing this Directive throughout the Community, and to ensure uniformly high standards of training and knowledge amongst landfill operators and staff by the provision of training courses

Whereas in order to provide sufficient funds for the control of a closed site it is proposed to create a 'Landfill aftercare fund' to ensure that closed landfills are properly monitored during the aftercare phase and appropriate curative action can be taken if needed;

Whereas, with a view to following the evolution of waste disposal by landfill, it is considered necessary to provide data,

HAS ADOPTED THIS DIRECTIVE:

Article 1

Field of application

1. Member States shall apply this Directive to any landfill as defined in Article 3 (e).
2. Transfer stations as defined in Article 3 (g) and facilities for the storage of waste as defined in Article 3 (h) shall be excluded from the scope of this Directive.

Article 2

Types of waste

For the purposes of this Directive 'waste' means any substance or object which is covered by Directive 75/442/EEC.

According to its origin, waste is classified as:

- 'municipal waste',
- 'industrial waste'.

According to its characteristics, waste is classified as:

- 'hazardous waste',
- 'non-hazardous waste',
- 'inert waste'.

Article 3

Definitions

For the purposes of this Directive:

- (a) 'municipal waste' means domestic refuse, as well as commercial or trade refuse and other waste which, because of its nature or composition, is similar to domestic refuse;
- (b) 'industrial waste' means waste arising from manufacturing or industrial activities or processes;
- (c) 'hazardous waste' means any waste which is covered by Council Directive 78/319/EEC of 20 March 1978 on toxic and dangerous waste⁽¹⁾;
- (d) 'inert waste' means waste that, when deposited into a landfill, does not undergo any significant physical, chemical or biological transformations and which complies with the eluate criteria set out in Annex III;
- (e) 'landfill' means a waste disposal site used for the controlled deposit of the waste onto or into land;
- (f) 'mono-landfill' means a landfill site or a part of it where only one defined type of waste is deposited; meaning by this waste which is comparable with respect to origin, composition, and the characteristics of their leachates;
- (g) 'transfer station' means a facility where waste is unloaded in order to permit its preparation for further transport for recovery, treatment or disposal elsewhere;
- (h) 'storage' means the controlled temporary deposit of waste prior to recovery, treatment or disposal. Waste to be stored for more than one year (long-term storage) will have to be stable, non-reacting waste, otherwise it will have to be previously stabilized. Permanent or indefinite storage shall be considered as equivalent terms to landfill;
- (i) 'treatment' means the physical, chemical or biological processes that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery;
- (j) 'leachate' means any liquid percolating through the deposited waste and emitted from or contained within a landfill;
- (i) 'treatment' means the physical, chemical, thermic or biological processes that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery;

⁽¹⁾ OJ No L 84, 31. 3. 1978, p. 43.

ORIGINAL TEXT

AMENDED TEXT

- (k) 'landfill gas' means all the gases generated from the landfilled waste;
- (l) 'eluate' means the solution obtained by a simulated laboratory leaching test;
- (m) 'operator' means the natural or legal person responsible for a landfill.

Article 4

Classes of landfill

1. Depending on the types of waste to be deposited the following classes of landfill will be considered within the scope of this Directive:
 - landfill for hazardous waste,
 - landfill for municipal and non-hazardous wastes and for other compatible wastes, as defined in the compatibility criteria set out in Annex III,
 - landfill for inert waste.
2. Each landfill shall be classified according to the terms of this Directive.
3. A landfill may receive a multiple classification, provided that the disposal operations are carried out in separate areas of the site, and that each of these areas complies with the specific requirements set for that class of landfill.
4. Independently of their type, wastes can be assigned to a mono-landfill, as defined in Article 3 (f). Mono-landfills will have to comply with the requirements fixed for the class of landfill to which they belong, according to the type of waste deposited in them.

Article 5

General requirements for all classes of landfill

A landfill must comply with the necessary requirements set out in Annexes I, III and IV in order to avoid environmental damage.

Article 6

Application for a permit

The application for a landfill permit, as required in Article 9 of Directive 75/442/EEC shall fulfil at least the requirements and procedures as specified in Annex II.

2. Following submission of the application for a permit, the competent authorities:
 - (a) within a period of three months may ask for additional information, modifications of the project, or for an alternative plan,
 - (b) within a period of 12 months after the last submission shall reach a definite conclusion.

ORIGINAL TEXT

AMENDED TEXT

Article 7

Conditions of the permit

Member States shall ensure that:

1. The competent authority shall not issue a landfill permit unless:
 - (a) the application is complete and in accordance with this Directive;
 - (b) the applicant (owner and/or operator of the facility) responds to the appropriate technical and financial specifications required to establish and operate a landfill;
 - (c) the landfill project complies with all the requirements laid down in this Directive;
 - (d) the landfill project is compatible with the waste disposal plans established pursuant to Article 7 of Directive 75/442/EEC;
2. prior to the commencement of disposal operations, the competent authority shall carry out an inspection of the site in order to ensure that it complies with the conditions of the permit.

- (a) the application is complete and in accordance with this Directive and the competent authority shall undertake sufficient inspections of the site prior to any operations (whether preparation or depositing) to ensure that the environmental standards can be assured.

Article 8

Content of the permit

1. In accordance with the provisions set out in Article 9 of Directive 75/442/EEC, the landfill permit shall state at least the following:
 - (a) the list of defined types of waste to be permitted or excluded in the landfill;
 - (b) the requirements for the landfilling operations and control procedures as well as for the closure and aftercare operations.
2. The permit may be revised. In order to revise a permit, the procedures set out in Articles 6, 7 and 8 (1) of this Directive shall apply.

- c) The obligation to report at least annually as required in Article 11 and Annex IV of this Directive.

Article 9

Waste not acceptable for landfill

Member States shall ensure that:

1. the following wastes shall not be accepted in a landfill:
 - wastes in liquid state, unless compatible with the type of wastes acceptable in each individual landfill, and with the operating procedure of the site (Annex IV: water balance).
 - wastes which, in the conditions of landfill, are explosive, oxidizing, highly flammable or flammable, as defined by Directive 78/319/EEC,
 - waste arising from medical or veterinary establishments which is infectious as defined by Directive 78/319/EEC,
 - any other type of waste which does not fulfil the criteria specified in Annex III, unless it is assigned to a mono-landfill as indicated in Article 10 (4) of this Directive;
2. no dilution of waste in order to meet the waste acceptance criteria shall be permitted either before or during the landfill operations

hospital and other clinical wastes arising from medical or veterinary establishments which is infectious as defined by Directive 91/689/EEC, and waste falling within category 14 (Annex Ia) of that hazardous waste Directive.

2. No dilution or mixture of waste in order to meet the waste acceptance criteria shall be permitted either before or during the landfill operations.

Article 10

Waste to be accepted in the different classes of landfill

Member States shall ensure that:

1. with the objective of guiding the different types of waste to be disposed of to the appropriate class of landfill the assessment of the characteristics of the waste with respect to landfilling requirements will be made by reference to:
 - the origin of the waste,
 - the composition of the waste,
 - the leaching and compatibility characteristics of the waste with respect to the eluate and compatibility criteria set out in Annex III;

ORIGINAL TEXT

AMENDED TEXT

2. hazardous wastes that fulfil the eluate criteria set out in Annex III shall be assigned to a hazardous waste landfill unless, if compatible with municipal waste, they are assigned to a landfill for municipal and non-hazardous wastes and for other compatible wastes;
3. hazardous wastes not fulfilling the eluate criteria shall be treated before disposal in a hazardous waste landfill;
4. hazardous wastes not fulfilling the eluate criteria set out in Annex III and which cannot be treated, or are not compatible for joint disposal with municipal waste, or any other type of wastes of a precise type, origin or composition, can be assigned to a mono-landfill. Specific requirements shall be fixed by the competent authority for these particular landfills according to the nature of the wastes to be deposited;
5. landfill for municipal, non-hazardous and other compatible wastes landfill sites can be used for:
 - (a) municipal waste;
 - (b) non-hazardous wastes of any other origin;
 - (c) liquid wastes and sludges compatible with the landfilled wastes and with the operation procedure of the site (Annex IV: water balance). Particular precautions shall be taken when disposing of liquid wastes to prevent the formation of aerosols as well as to promote uniform trickling and thus avoid the occurrence of preferential paths through the landfill;
 - (d) any other wastes or mixture of wastes compatible with the landfilled wastes, if their joint disposal supposes any advantage with respect to waste management and environmental protection, due to the beneficial interactive processes that occur between the different types of waste when mixed (Compatibility criteria: Annex III);
6. inert waste landfill sites shall be used only for inert waste that complies with the criteria set out in Annex III. If necessary, in order to meet the criteria, waste with a majority of inert components shall be previously sorted or treated to separate those components that might give rise to any physical, chemical or biological transformation.

4. hazardous wastes not fulfilling the eluate criteria set out in Annex III and which cannot be treated can be assigned to a mono-landfill. Specific and, if appropriate, additional and more stringent requirements shall be fixed by the competent authority for these particular landfills according to the nature of the wastes to be deposited in order to ensure at least the same level of environmental protection as for hazardous waste landfills as provided for in this Directive.

- (e) Joint disposal, where legally practised, shall be authorised according to the terms of this directive for a maximum period of 5 years after implementation of this directive, after which it shall be banned.

- 5a. hazardous municipal waste which has been collected separately is assigned to a hazardous waste landfill;

- 6a. any type of waste of a precise type, origin or composition can be assigned to a mono-landfill. Specific requirements shall be fixed by the competent authority for these particular landfills, according to the nature of the waste to be deposited.

Article 11

Waste acceptance procedures

Member States shall take measures in order that:

1. the operator of a landfill shall accept waste only if, before or at the time of delivery, the holder can show, by means of the appropriate documents, that the waste in question can be accepted in that site, according to its class and the conditions set in the permit, and that it fulfils the acceptance criteria (Annex III);
2. the operator of a landfill shall be responsible for:
 - (a) checking of the waste documentation;
 - (b) visual inspection and control of the waste at the entrance and at the tipping front;
 - (c) the application, if required according to the provisions laid down in Annex III, of a sampling and analysis programme of the waste delivered. This programme can be carried out by an approved laboratory contracted by the operator or by the operator himself if he possesses adequate and approved laboratory facilities;
 - (d) keeping a register of the quantities and characteristics of the wastes deposited, indicating origin, date of delivery, producer, and, in the case of hazardous waste, the precise location on the site;
 - (e) reporting on a yearly basis to the competent authority on the types and quantities of waste disposed of and on the results of the control programme, as required in this Article and in Annex IV;
3. when the producer or the holder of the waste is a frequent user of the landfill, he must reach a written contractual agreement with the operator of the site in order to deliver his waste to the landfill. The document shall describe the general characteristics of the waste delivered;
4. the operator of the landfill shall always provide written justification of each delivery accepted on the site. This document can be considered as evidence of the disposal of the waste and also as an agreement by single users of the landfill;

1. the operator of a landfill shall accept waste only if, before or at the time of delivery, the holder has had established and can show, by means of the appropriate documents, that the waste in question can be accepted in that site, according to its class and the conditions set in the permit, and that it fulfils the acceptance criteria (Annex III);

3. when the producer or the holder of the waste is a frequent user of the landfill or intends to dispose of large quantities of waste on a non-periodical basis, he must reach a written contractual agreement with the operator of the site in order to deliver his waste to the landfill. The document shall describe the general characteristics and also the origin and type of the waste delivered. Waste not included in the agreement shall be subject to the acceptance criteria established for that specific landfill;

ORIGINAL TEXT

AMENDED TEXT

5. if waste is not accepted at a landfill the holder shall return it to the producer unless another adequate means of disposal, complying with all the necessary requirements, can be found;
6. the responsibility for the acceptance of waste on a landfill falls upon the site operator.

5. if waste is not accepted at a landfill the holder shall **notify the competent authority of the non-acceptance of the waste and shall return it to the producer unless another adequate means of disposal, complying with all the necessary requirements, can be found; in any event the competent authority shall be informed by the holder of the final destination of the waste, all at the waste producer's expense;**

Article 12

Control procedures in operation and aftercare phases

Member States shall take measures in order that:

1. the operator of a landfill shall carry out during the landfill operation and aftercare phases a control programme as specified in Annex IV;
2. the operator shall notify the competent authority if any adverse environmental effects are discovered as a result of the control procedures and, in all cases, the operator must notify the competent authority of the nature and timing of the proposed measures to be taken;
3. corrective measures shall be taken, at the expense of the operator, if adverse environmental effects from the landfill operation are discovered. These measures may be subject to direction by the competent authority and may be carried out by that authority if the operator does not carry them out himself;
4. qualified laboratories responsible for the quality control of the analytical operations of the control procedures are designated.

Article 13

Closure procedure

Member States shall ensure that:

1. a landfill or part of it shall start the closure procedure:
 - (a) when it has reached its capacity, that is, when the definitive height of the waste deposited reaches the height defined in the landfill project required for the permit or expressed in it, or

ORIGINAL TEXT

AMENDED TEXT

- (b) by decision of the owner of the site, with the authorization of the competent authority, or
- (c) by decision of the competent authority.

(b) by decision of the owner and/or the operator of the site, with the need for agreement if they are different entities under the authorization of the competent authority, or

(c) by decision of the competent authority subject to appeal by the operator.

Whatever the case the competent authority has to justify its decision;

- 2. a closed landfill shall always receive a final cover in order to accommodate the site to its future uses and integrate it in the surrounding landscape.

The type and characteristics of the cover to be applied shall take into consideration the class of landfill, the types of waste deposited and the particular characteristics of the site in order to control its further development;

- 3. prior to the commencement of the total or partial closure of a landfill, the operator shall present to the competent authority the information required in Annex II and in particular on the measures to be provided for the monitoring and control of surface run-off water, gas and leachate emissions from the landfill, and for the protection and monitoring of groundwater as indicated in Annex IV;
- 4. a landfill or part of it may only be considered as definitely closed after the competent authority has carried out a final on-site inspection and has communicated to the operator its permit for the closure;
- 5. after a landfill has been definitively closed, the operator shall be in charge of its maintenance, monitoring and control in the aftercare phase for a period of 10 years or for a shorter period if the competent authority authorizes it.

4
5a at least 30 years after closure of the landfill or for as long as needed if the site poses an active risk, leachate from the site and the groundwater regime in the vicinity of the site are monitored and analysed at least twice a year (Annex IV) to ensure that the site remains safe.

Article 14

Civil liability of operator

The operator shall be liable under civil law for the damage and impairment of the environment caused by the landfilled waste, irrespective of fault on his part.

Article 15

Existing landfill sites

Member States shall ensure that:

1. landfills which have been granted a permit, or which are already in operation at the time of notification of this Directive, may not continue to operate unless they comply with the provisions set out in points 2 and 3;
 2. to be able to continue to operate, the operators of the sites referred to in point 1 shall apply to the competent authority for a confirmation of their permit or, in the event that the facility does not comply with the terms of this Directive, for the issue of a new or revised permit. The competent authority shall not grant the permit unless the future operation of the remaining part of the site meets the conditions laid down in this Directive;
 3. within a period of five years after the date of implementation of this Directive:
 - (a) the operator of a landfill shall, if required, prepare and present to the competent authorities, for their approval, a conditioning plan for the site supplying the information required in Annex II,
 - (b) the competent authorities shall consider the demand and reach a definite conclusion,
 - (c) the operator shall carry out the conditioning plan of the site;
 4. if after five years after the date of implementation of this Directive there are previously existing landfills which do not have a permit for continuing operations, the competent authorities shall take the appropriate measures for the closure of those sites.
3. (a) Within a period of one year after this Directive enters into force, the operator of a landfill shall prepare and present to the competent authorities, for its approval, a conditioning plan for the site (Annex II),
 - (b) Within a period of one year after the presentation of the conditioning plan, the competent authorities shall reach a definite conclusion,
 - (c) On the basis of the approved site conditioning plan, the competent authority shall authorise the necessary works and shall lay down a specific transitional period which may not exceed two years for the completion of the plan.

Article 16

Cost of the landfill of waste

Member States shall ensure that the price to be charged for the disposal of any type of waste in a landfill shall cover at least all the costs involved in the setting up and operation of the site, as well as the estimated costs of the closure and aftercare of the facility.

Article 16

Member States shall ensure that the price to be charged for the disposal of any type of waste in a landfill shall cover at least all the costs involved in the setting up and operation of the site, as well as the estimated costs of the closure and aftercare of the facility, also to cover the financing of schemes of training for the professional and technical development of the personnel required to undertake the aforementioned tasks.

Article 17

Financial guarantee

Member States shall ensure that, at the time of receiving a permit, the operator provides, by whichever means, a financial guarantee or any other equivalent, fixed by the competent authority, whose purpose shall be to cover the estimated costs of the closure procedures and aftercare operations of the landfill. This guarantee shall be kept as long as the operator is in charge of the maintenance and aftercare operations of the site.

Article 18

Landfill aftercare fund

1. Member States shall ensure the establishment of one or more 'Landfill aftercare funds' whose structure is to be fixed by the competent authorities.
2. The purpose of these funds shall be:
 - (a) to cover the normal aftercare costs of closed landfills;
 - (b) to cover the expenses originated by the operations necessary to prevent or cure the damage to the environment produced by the disposal of waste in case it is not otherwise recoupable or not covered by insurance or financial guarantee.
3. The fund shall not cover the costs that can be directly charged to the landfill operator as long as he is liable.
4. The operator of each landfill shall contribute to the 'Landfill aftercare fund' in the light of the class of landfill and of the types and tonnage of the wastes landfilled. The financial guarantee set out in Article 17 does not free the operator from contribution to the Fund.

ORIGINAL TEXT

AMENDED TEXT

Article 19

Article 19

Obligation to report

1. Each year, and for the first time on, Member States shall forward to the Commission a report on the landfill of waste containing the information necessary for the Commission to evaluate the compliance with the terms of this Directive.

1. Each year, and for the first time on, Member States shall forward to the Commission a report on the landfill of waste containing the following information:

- individual data on each landfill in operation as indicated in paragraph 2 of this article,
- cumulative data, at national level, of the quantities and types of waste disposed of and the total cost of disposal,
- existing plans for the setting up of new landfill sites,
- closed down landfill sites,
- a report on the technical and financial activities of the Landfill Aftercare Fund.

1a. The data to provide for each specific landfill shall be the following:

- reporting period,
- name of the facility location,
- owner and/or operator,
- types and quantities of wastes received during the reporting period,
- cost of disposal (per tonne),
- area served,
- year in which operations started,
- total accumulated quantities of wastes deposited,
- calculated final capacity of the site,
- year in which final capacity is expected to be reached.

A model of the data table to be provided on each landfill is included in Annex IV.

2. On the basis of the report referred to in paragraph 1, the Commission shall publish a consolidated report every three years, and for the first time on

2. On the basis of the report referred to in paragraphs 1 and 2, the Commission shall publish a consolidated report every three years, and for the first time on ...

Article 20

Committee

The amendments necessary for adapting the Annexes to this Directive to scientific and technical progress and proposals of standardization about control, sampling and analysis methods in relation to the landfill of waste, shall be adopted in accordance with the following procedure.

The Commission shall be assisted by a committee composed of the representatives of the Member States and chaired by the representative of the Commission.

The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148 (2) of the EEC Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The chairman shall not vote.

The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

If, on the expiry of a period of three months from the date of referral to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

ORIGINAL TEXT

AMENDED TEXT

Article 20a

Training and information

Member States shall take the necessary measures to ensure the provision of:

- (a) the professional and technical development and training of landfill operators and staff,**
- (b) information campaigns on landfill operations and techniques for the benefit of both public authorities and the public in general.**

Article 21

Enforcement

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive within one year of its notification. They shall immediately inform the Commission thereof.

When Member States adopt these measures, these shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The procedure for such reference shall be adopted by Member States.

2. Member States shall communicate to the Commission the texts of the provisions of national law which they adopt in the field covered by this Directive.

Article 22

This Directive is addressed to the Member States.

ANNEX I

GENERAL REQUIREMENTS FOR ALL CLASSES OF LANDFILLS

1. Location

1.1. The location of a landfill must take into consideration requirements dealing with:

- (a) the distances from the boundary of the site to residential and recreation areas, roads and waterways, water bodies and other industrial, agricultural or urban sites;
- (b) the existence of groundwater or nature protection zones in the area;

(c) the hydrogeological conditions of the area;

(c) the geological and hydrogeological conditions of the area;

- (d) the risk of flooding, subsidence, landslides or avalanches in the site;
- (e) the protection of the natural or cultural patrimony of the area.

1.2 The landfill can be authorized if the characteristics of the site with respect to the abovementioned requirements, or the corrective measures to be taken, when considered in an environmental impact assessment in the meaning of Directive 85/337/EEC indicate that the landfill does not pose a serious environmental risk.

1.2 The landfill can only be authorized if the characteristics of the site with respect to the abovementioned requirements, or the corrective measures to be taken, when considered in an environmental impact assessment in the meaning of Directive 85/337/EEC indicate that the landfill does not pose a serious environmental risk.

2. Roads and service areas

2.1. Access to a landfill shall be planned in such a way that it creates minimal hindrance to existing public roads.

2.2. The landfill shall be equipped so that dirt originating from the site is not dispersed onto public roads.

2.2. The landfill shall be equipped so that dirt originating from the site is not dispersed onto public roads and surrounding land.

2.3. All roads and service areas within the boundary of the landfill must be built and maintained to comply with the water control and soil and groundwater protection measures required for the site itself.

3. Fencing

3.1. The landfill shall be surrounded by fencing sufficient to prevent free access to the site. The gates shall be locked outside operating hours.

4. Landscaping

4.1. Measures shall be taken in order to reduce the visual impact of a landfill, in particular when easily visible from residential areas, recreation areas and roads.

5. Site identification and information

5.1. At the entrance of a landfill an identification and information board must be provided displaying the following information:

- name and class of the site.
- name of the owner and or operator.
- licensing identification.
- operating times.
- contact and emergency telephone numbers.
- authority responsible for the operating permit and control of the site.

5.2. The additional information must always be available to the public, on request:

- types of wastes for which the site has received an operating permit.
- tariffs to be applied for the depositing of waste on the site.

6. Control of access and operation

6.1. An appropriate system for control of access must always be provided at the entrance of the site.

6.2. All waste delivered shall always be controlled on its

- origin,
- type and characteristics,
- quantity (weight or volume),

- the appropriate identification documents, if required.

- the appropriate identification.

6.3a The system of control and access to each facility should contain a programme of measures to detect and discourage illegal dumping.

6.3. During operating hours, a suitably qualified person in charge of the landfill operations must always be present

7. Water control and leachate management

7.1. Appropriate measures shall be taken in order to control surface and/or groundwater entering into the landfilled waste.

7.2 All water or leachate emanating from the landfill shall be collected unless, through an environmental impact assessment, it is determined that collection is not required.

7.2 All water or leachate emanating from the landfill shall be collected by means of an efficient drainage system, so as to ensure that no water accumulates at the bottom of the site, unless, through an environmental impact assessment, it is determined that collection is not required.

7.3. Contaminated water and leachate collected from the landfill shall be treated to the appropriate standard required for its discharge.

8. Protection of soil and groundwater

8.1. A landfill must meet the necessary conditions, naturally or artificially achieved, to prevent pollution of the soil or groundwater.

8.2. The non-saturated geological formations constituting the substratum of the landfill base and sides shall satisfy the following permeability and thickness requirements.

Maximum values of the permeability coefficient, K (m/s), for a substratum thickness of three metres measured under conditions of water saturation:

- Landfill for hazardous waste:

$$K = 1.0 \times 10^{-9} \text{ m/s.}$$

- Landfill for municipal and non hazardous wastes and for other compatible wastes:

$$K = 1.0 \times 10^{-8} \text{ m/s.}$$

- Landfill for inert waste:

$$K = \text{no limit value.}$$

8.3. The method to be used for the determination of the permeability coefficient for landfills, in the field and for the whole extension of the site, is to be developed and approved by the committee set up in Article 20 of this Directive.

8.4. Where these conditions, or other equivalent ones, are not met naturally, engineering measures shall be taken to achieve at least the same level of safety.

9. Gas control

9.1. Appropriate measures shall be taken in order to control the accumulation and migration of landfill gas (Annex IV).

9.2 Landfill gas shall be collected and properly treated and preferably used. This obligation applies to biologically active sites receiving or having received more than 10 000 metric tons of wastes per annum.

9.2 Landfill gas shall be collected and properly treated and preferably used in such a way as to minimise damage to or deterioration of the environment unless by an environmental impact assessment it is determined that collection is not required.

10. Nuisances

10.1. Measures shall be taken to prevent nuisances arising from the landfill through:

- emission of odours and dust,
- wind blown materials.
- noise and traffic.

- birds and vermin,
- formation of aerosols.

- birds, and vermin and insects.

11. Control of stability

11.1. To provide for stability of the mass of waste and associated structures, particularly in respect of avoidance of slippages, the emplacement of waste on the site shall take place under suitable systems of quality assurance.

ANNEX II

Basic information to provide in the case of:

- A. The establishment and operation of a landfill
- B. The conditioning plan of an existing landfill
- C. The closing of a landfill

When applying for a permit, the documents to be presented shall adjust to and focus on the particular situation of the site, in function of the alternative (A, B, C) considered.

The basic information to provide shall be the following:

- 1. complete identification of the applicants;
- 2. description of the types and quantities of wastes to be deposited (A, B) or that have been deposited (B, C);
- 3. waste management capacity (daily, monthly, yearly) for which the facility is projected;
- 4. report with a comprehensive description of the site including:
 - situation and access,
 - boundaries and topography,

- geological and hydrological characteristics of the area,

geological and hydrological characteristics of the area based upon appropriate data and on samples taken in situ,

- local meteorology;

- local meteorology, taking into account the most unfavourable weather conditions;

5. engineering details of the project including the development, conditioning and/or closing of the site:
 - phases of the project,
 - access, fencing and site roads,
 - pollution prevention and abatement methods envisaged,
 - site preparation and provision of services,
 - complementary installations;

6. of operation and control plan for the site including:
 - phasing and description of the operations,
 - water, leachate and gas control measures,
 - measures for the control of environmental nuisances,
 - operating times,
 - access control and waste acceptance procedures,
 - equipment to be utilized,
 - personnel list indicating qualifications, duties and responsibilities,
 - monitoring and maintenance procedures,
 - operational and safety rules and emergency procedures;

7. plan for the closure and aftercare procedures including:
 - final capacity and expected operational period of the facility,
 - final contours and topography of the site,
 - final restoration plan,
 - phases for partial closure and restoration of filled-up areas,
 - aftercare control measures;

8. environmental impact assessment in the meaning of Directive 85/337/EEC;

9. economic information on the project including estimations of the initial:
 - capital investment,
 - operational costs,
 - charges.

ANNEX III

WASTE ACCEPTANCE CRITERIA AND PROCEDURES

1. Introduction

In order to harmonize technical characteristics of landfills it is of great importance that all sites use, if only for comparison purposes, the same criteria for the acceptance of waste. This means that homogeneous sampling and control procedures will have to be fixed and all wastes be subject to them.

For the purpose of this Directive waste acceptance criteria and control procedures will be fixed in function of the characteristics of the eluate and of the compatibility of different types of waste in the cases of joint disposal (eluate and compatibility criteria).

No matter which are the sampling and analysis methods selected or the parameters to measure, it is to be realized that the tests upon which acceptance criteria are based will never reproduce the exact behaviour of the wastes in the landfill but they will serve as the measuring stick against which the characteristics of the wastes are tested. This means that, in spite of the existence of different sampling and analysis methods, or the relative importance granted to different parameters, a common reference method will have to be fixed as described in this Annex.

2. General principle

All wastes discharged into a landfill will have to be previously characterized according to the requirements of this Annex.

For any waste whose origin is known and whose characteristics and composition are defined, the compulsory sampling and analysis can be substituted by a periodical random sampling and analysis programme.

3. Sampling

Definitions:

A. *Homogeneous waste:*

All types of waste which at the time of sampling, are liquid or can be pumped and whose characteristics are the same throughout the whole mass, as well as those wastes whose homogeneity can be visually established.

Heterogeneous waste:

All other wastes.

B. *Representative sample:*

A sample is to be considered as representative if the small amount of material weighed out for the analyses has the same average composition as the large mass from which it is derived. *Reference:* General guidelines on sampling technology, ISO 5667-2-1988.

Number of samples and amounts to be taken

1. *For wastes not delivered in containers*

- (a) for homogeneous waste: one sample of 1 000 g or ml, per delivery;
- (b) for heterogeneous waste: one representative sample of 1 000 g or ml, per five tons of waste or part thereof.

2. *For wastes delivered in containers*

Figures are valid for containers with the same content. The waste is considered homogeneous at the time of sampling. If the containers are emptied into a collecting tank, the cumulative sample can be taken from the tank.

Weight per container	Weight and number of containers to be sampled for a laboratory sample
< 5 kg	Sufficient for a cumulative sample of at least 1 kg taken from at least x (*) containers
> 5 kg	Sufficient for a cumulative sample of between 1-2,5 kg taken from at least x (*) containers

(*) Where: $x = \sqrt{n + 1}$, n being the total number of containers.

3. *Municipal waste*

It is considered necessary to regularly sample these wastes as there is a need to evaluate the changes in composition in order to be able to take appropriate action in advance or as an alternative to landfilling, e.g.: prevention of contamination, selective collection, recycling, etc.

- Waste from households: sampling shall be done at random from all types of origins of the waste in order to determine the percentage composition (organics, metals, etc.), calorific value, heating residue, etc.
- If containers appear with unknown types of waste, these shall undergo independent sampling as in point 2.
- Waste from commerce, offices or public institutions shall be described by the producer. Analytical testing will be done only to allow a complete evaluation or if the declaration is not adequate.

4. Control procedures: eluate criteria (not to be applied to municipal waste)

Eluate criteria

Numerous physico-chemical and biological processes govern the production and composition of landfill leachates. In general the composition of leachates will be a function of the types and age of waste deposited, the prevailing physico-chemical conditions, the microbiology and the waterbalance of the landfill. Although numerous studies have been devoted to the evaluation of the relationship between laboratory tests and the fate of leachates, the scarcity of true information in the long term is outlined. Nevertheless, the potential to severely affect water resources by leachates exists and should be prevented. The proposed eluate tests hereunder, have no other aim other than providing qualitative information on the composition of percolating waters and the nature of the mobilized potentially toxic substances. *Reference:* Étude bibliographique sur les lixiviats produits par la mise en décharge de déchets industriels, 4 volumes, EEC-XII-ENV/20/86.

Treatment of the samples:

The original structure of the sample used should be maintained as far as possible; large parts should be crushed. The proposed analytical method is DIN 38414-S4 (October 1984 issue) with the following additions and/or simplifications:

- a wide-necked glass bottle (10 cm diameter) should be used,
- shake, rotating bottle by 180° once per minute for 24 hours,
- centrifuge; 250 µl filter syringes with 0,45 µm filters should be used for sampling.

Assignment values:

This table fixes the ranges by which wastes will be characterized for the purpose of landfilling according to the composition of their eluates:

- wastes whose eluate concentration is in the range fixed for hazardous wastes will be considered as such with respect to landfilling.

For eluate concentrations higher than the maximum values fixed, hazardous wastes will have to be treated prior to landfill, *unless compatible for joint disposal with municipal wastes*, or, if treatment is not possible, *destinated to a mono-landfill*.

For eluate concentrations higher than the maximum values fixed, hazardous wastes will have to be treated prior to landfill, *unless compatible for joint disposal with municipal wastes*, or, if treatment is not possible, *destined to a mono-landfill*.

(*)

- wastes whose eluate concentration is not above the maximum values fixed for inert wastes will be considered as such,
- wastes whose eluate concentration falls in the range between inert wastes and the minimum value for hazardous wastes will be considered non-hazardous.

		Hazardous waste range	Inert waste
1.01	pH value	4—13	4—13
1.02	TOC	40—200 mg/l	< 200 mg/l
1.03	arsenic	0,2—1,0 mg/l	< 0,1 mg/l
1.04	lead	0,4—2,0 mg/l	} the total of these metals: < 5 mh/l (*)
1.05	cadmium	0,1—0,5 mg/l	
1.06	chromium	0,1—0,5 mg/l	
1.07	copper	2—10 mg/l	
1.08	nickel	0,4—2,0 mg/l	
1.09	mercury	0,02—0,1 mg/l	
1.10	zinc	2—10 mg/l	
1.11	phenols	20—100 mg/l	< 10 mg/l
1.12	fluoride	10—50 mg/l	< 5 mg/l
1.13	ammonium	0,2—1,0 mg/l	< 50 mg/l
1.14	chloride	1,2—6,0 g/l	< 0,5 g/l
1.15	cyanide (2)	0,2—1,0 mg/l	< 0,1 mg/l
1.16	sulphate (3)	0,2—1,0 g/l	< 1,0 g/l
1.17	nitrite	6—30 mg/l	< 3 mg/l
1.18	AOX (4)	0,6—3,0 mg/l	< 0,3 mg/l
1.19	solvents (5)	0,02—0,10 mgCl/l	< 10 µg Cl/l
1.20	pesticides (5)	1—5 µg Cl/l	< 0,5 µg Cl/l
1.21	lipoph. sub.	0,4—2,0 mg/l	< 1 mg/l

(1) And no single value above the minimum fixed for hazardous waste.

(2) Readily released.

(3) If possible < 500 mg/l.

(4) Adsorbed organically-bound halogens.

(5) Chlorinated.

Notes:

1. For characterization purposes the components to be analysed in the eluates shall be chosen in function of the qualitative composition of the waste.
2. In addition to these eluate criteria, a determination of asbestos on a representative sample of the crude inert waste shall be performed, according to the annexes of the Council Directive 87/217/EEC on the prevention and reduction of environmental pollution by asbestos.

(*) This amendment concerns only the English version (linguistic correction).

5. Analytical methods

The following ISO or DIN methods are proposed as reference methods. Any equivalent method after a certification procedure based on the use of a certified reference material will be accepted. In case of discrepancy of the results the proposed methods will be used as reference.

1.01	pH	ISO-DP 10 523 or DIN 38404-C5-84,
1.02	TOC in eluate	DIN 38409-H3-85.
1.03	arsenic	ISO 6595-1982 or DIN 38405-E6-81,
1.04	lead	ISO 8288-1985 or DIN 38406-E6-81,
1.05	cadmium	ISO 8288-1985 or DIN 38406-E19-80,
1.06	chromium VI	ISO-DIS 9174-88 or DIN 38405-D24-87,
1.07	copper	ISO 8288-1985 or DIN 38406-E21-80,
1.08	nickel	ISO 8288-1985 or DIN 38406-E21-80,
1.09	mercury	ISO 5666-1/3-88 or DIN 38406-E12-80,
1.10	zinc	ISO 8288-1985 or DIN 3840-E8-85,
1.11	phenols	ISO 6439-1990 or DIN 38409-H16-84,
1.12	fluoride	ISO-DP 10 359-1 or DIN 38406-D4-85,
1.13	ammonium	ISO 7150-1983 or DIN 38406-E5-83,
1.14	chloride	ISO-DIS 9297 or DIN 38405-D1-85,
1.15	cyanide	DIN 38405-D14-88,
1.16	sulphate	ISO-DIS 9280-1 or DIN 38405-D5-85,
1.17	nitrite	ISO 6777-1983 or DIN 38405-D10-81,
1.18	AOX	ISO-DIS 9562 or DIN 38409-H14-85,
1.19	chlorinated solvents ⁽¹⁾	ISO-DP 10 301 or GC head-space
1.20	chlorinated pesticides ⁽²⁾	G.C. (capillary column)
1.21	extractible lip. substances ⁽²⁾	cf. param. 27, Directive 80/778/EEC

⁽¹⁾ Needs 2 ml of eluate.

⁽²⁾ After extraction of 1 litre of eluate.

⁽²⁾ Needs 250 ml of eluate; chloroform extract, results in 'dry residue' mg/l.

6. Control procedures: compatibility criteria

Joint-disposal of waste normally utilizes properties available in municipal waste to attenuate those constituents in difficult wastes which are polluting and potentially hazardous and thereby make their impact on the environment acceptable. Wastes destined for joint-disposal must be critically assessed and only those wastes which are compatible with municipal waste should be accepted for joint-disposal. The maintenance of a balanced input of wastes to ensure that the attenuation processes are not overwhelmed is essential: controlling the rate input of hazardous wastes is therefore always necessary.

6.1. General criteria — Prerequisite conditions

Sites which would pose a direct threat to a sensitive aquifer in the event of containment failure shall not be used for joint-disposal. The acceptability of joint-disposal in any given location shall be determined by the competent authority, in accordance with the requirements of Annex I to this Directive.

6.2. Leachate monitoring — Prerequisite conditions

- Sufficient historic data must be available to provide a clear definition of leachate levels and quality within the refuse mass.
- Specific measures for joint-disposal shall be set by the competent authority subject to the control requirements fixed in Annex IV and to the compatibility criteria fixed hereunder. The number of monitoring points in landfills where joint-disposal is practised shall be the following in function of the surface area of the operating zone:
 - < 5 ha = minimum 5,
 - 5—10 ha = one per hectare,
 - > 10 = $10' \text{ ha} + (\text{area, ha})^{1/2}$.

- Joint-disposal shall not be undertaken unless monitoring shows clearly that stable methanogenic conditions are established and that a sufficient high level of activity continues. This will be determined by reference to leachate quality and gas production rate, and the following minimum conditions shall be maintained:
 - average leachate temperature: ≥ 25 °C,
 - average leachate pH: $> 6,8$,
 - average leachate BOD:COD ratio: $\leq 0,3$,
 - gas production rate: > 5 m³/t.a.
- There shall be a system for collection and removal from site of any surplus leachate. This shall be sized on the basis of agreed water balance calculations, taking into account both infiltrating rainfall and the liquid content of the landfilled wastes.

6.3. Suitable and unsuitable wastes

6.3.1. The following wastes shall not be jointly disposed:

- wastes mentioned in Article 9 of the Directive
- acid tars
- immiscible organic solvents or aqueous waste containing > 1 % immiscible organics
- water miscible organic solvents with concentrations > 10 %
- wastes which react violently with water or organic matter
- asbestos (*)
- wastes containing significant concentrations (**) of following compounds:
 - PCBs & PCTs (polychlorinated bi-and terphenyls) > 50 ppb (**)
 - TCDDs (tetrachlorodibenzodioxin) > 10 ppb for isomer 2, 3, 7, 8
 - PCNs (polychlorinated naphthalenes) > 50 ppm total (**)
 - PAH (polyaromatic hydrocarbons) > 20 ppm
 - organometallic compounds (totally excluded)
 - chlorinated hydrocarbons (including chlorophenols) > 1 ppm
 - pesticides > 2 ppm
 - free cyanides > 10 ppm.

6.3.2. The following wastes (*) may be jointly-disposed, subject to individual assessment and loading rate restrictions on specific components:

- industrial effluent treatment sludges
- biological treatment sludges
- acid sludges,
- interceptor wastes and tank sludges
- paint wastes and spray booth effluents
- alkaline degreasants
- detergents, fats and greases in water
- adhesive wastes
- tannery and fellmongering wastes
- brewery wastes
- animal and food industry wastes
- metal finishing wastes
- acids/alkalis
- cutting oils/cooling oils

(*) Excluded because of the risks posed by excavation during joint-disposal.

(**) The 'significant concentration' figures are extracted from EEC directives for PCBs and PCTs; from WHO proposals for TCDDs and organometallic compounds; from the Dutch legislation (Bodemverontreiniging - Toetsingswaarden voor de beoordeling van de concentratieniveaus van diverse verontreinigingen) for PCNs, PAHs, chlorinated hydrocarbons, pesticides and free cyanides. This values should be revised by a special Committee.

(*) Part per billion, or $\mu\text{g}/\text{kg}$ on dry extract, etc.

(*) Part per million, or mg/kg on dry extract, etc.

(*) The list is not exhaustive, but based on types of wastes which have been successfully jointly disposed in several landfills (aqueous solutions excluded!).

6.4. Loading rates

For hazardous wastes to be jointly disposed with municipal waste, their rate of deposition will be limited by the attenuation capacity of the accepting bulk of municipal waste. Although general guidelines can be given, the loading inevitably will be site specific. Effective monitoring of the conditions in the landfill provide the best guidance for setting appropriate loading rates.

Loading rates are normally quoted as a quantity of hazardous waste which may be deposited either in a given period (eg. as per m³ of municipal waste per day), or related with a given quantity of the accepting bulk (eg. as g per m³ of municipal waste) for a once-only base filling. This is the loading or rate which could be degraded or attenuated by a unit volume (1) of methanogenic refuse. The landfill loading potential should then be applied to the reaction zone volume to derive a total loading limit for the site.

The loading rate controls shall apply to wastes containing: acids, heavy metals, cyanides, soluble organic carbon, phenols and other prescribed organic compounds. Ammonia and chloride inputs shall also be assessed, on the basis that all of the applied loading will appear in the leachate. Applied loadings must not lead to the capacity of leachate treatment and disposal systems being exceeded.

Default values (as mentioned in the criteria values given hereunder) are to be applied for the calculation of the maximum landfill loading potential, unless site/waste-specific data submitted by the operator justify higher loadings.

Criteria for calculating landfill potentials

Waste component	Default value
acids (1)	100 equiv./tonne of municipal waste
heavy metals (2) (3)	100 g/tonne of municipal waste
Zn	100 g/tonne of municipal waste
Cu	100 g/tonne of municipal waste
Ni	100 g/tonne of municipal waste
Cr	100 g/tonne of municipal waste
Pb	100 g/tonne of municipal waste
Cd	10 g/tonne of municipal waste
Hg	2 g/tonne of municipal waste
As, Se	1 g/tonne of municipal waste
cyanide (as CN)	1 g/m ³ of municipal waste, per day (4)
phenol	5 g/m ³ of municipal waste, per day (4)
oil/hydrocarbons	2,5 kg/tonne of municipal waste
TOC	10 g/m ³ of municipal waste, per day (7)
specified organics (4)	10 g/m ³ of municipal waste, per day

(1) Loadings to be calculated on a once-only basis, unless site monitoring in reaction zone demonstrates regeneration of buffer capacity. Acids shall be deposited in a separate area from wastes containing cyanide or sulphide.

(2) Loadings to be calculated on a once-only basis. A prior precipitation test shall be applied to any waste containing >100 mg/l soluble heavy metals. This should consist of a pH adjustment to 10,5, mixing for five minutes, followed by settlement for 30 minutes. If the soluble metal content then exceeds 20 mg/l the waste shall not be jointly disposed unless the operator can provide practical evidence to show its attenuations in refuse.

(3) The maximum default value for the total of heavy metals shall not surpass the 100 g/tonne of municipal waste.

(4) Organic compounds of List 1 from the Directive 80/68/EEC on groundwater.

(5) Unless site/waste-specific data on particular wastes show them to be completely degraded. No waste containing > mg/l as soluble CN shall be jointly disposed.

(6) Unless site monitoring shows the reaction zone ability to degrade completely the phenols.

(7) Unless specific data on particular wastes show them to be highly degradable.

(1) The reaction zone volume is that portion of leachate-saturated refuse with which the jointly-disposed waste will come into contact either directly or during leachate recirculation. The reaction zone must provide an average retention time of at least six months for applied liquid wastes and for leachate from jointly disposed solid hazardous waste.

6.5. *Monitoring adherence to loading controls*

For acids, heavy metals, TOC, oil, phenols, cyanide, ammonia and chloride, control shall be based on retrospective analysis of composite samples from all inputs. The frequency of such analysis shall be related to the hydraulic retention time (HRT) in the reaction zone, as follows:

- HRT > 12 months, analyse monthly.
- HRT < 12 months, analyse 2-weekly.

The leachate monitoring regime shall be prescribed in the site permit to be sufficiently detailed as to detect any effects which would indicate overloading of the reaction zone. This would include both detection of residual waste components and interference with the established methanogenic processes.

6.6. *Hazardous solid wastes*

A composite sample between 1 and 2,5 kg shall be prepared by mixing 1 kg subsamples from each load of hazardous solid waste. The composite shall then be subjected to a leaching test as described in III.4. The eluate shall then be analyzed for all parameters listed in the table of § 6.4 (including specified organics). Loadings to the site shall then be assessed on the basis of the mass of readily soluble components. The frequency of analysis shall be related to the hydraulic retention time as given in § 6.5.

7. *Intercalibration*

The qualified laboratories as designated in Article 12 (4) of this Directive shall participate periodically in intercalibration exercises in order to update and improve the accuracy and precision of the control procedures and analytical methods.

ANNEX IV

CONTROL PROCEDURES IN OPERATION AND AFTER-CARE PHASES

Measuring Programme

This minimum programme shall be carried out during the operational phase as an aid in the general management of the landfill, and during the after care phase for a minimum of 30 years after the definitive closure to prevent further damage to the landfill body or to the environment and to ensure that the site remains safe. The data obtained during long periods of time and for different sites will contribute to increase the knowledge on waste behaviour in landfills.

1. *Meteorological data*

In situ, or from the nearest station providing data representative of the site ⁽¹⁾.

		Operating phase	After-care phase
1.1	Volume and intensity of precipitation	daily	monthly on the same day of the month
1.2	Temperature (min., max., 14.00 h CET)	daily	
1.3	Direction and force of prevalent wind	daily	
1.4	Evaporation (lysimeter) ⁽¹⁾	daily	
1.5	Atmospheric humidity (14.00 h CET)	daily	

⁽¹⁾: Or by measuring parameter 1.5 and calculation of evaporation according to Haude.

⁽¹⁾ Parameters 1.1 to 1.5 can be replaced by the 'effective rainfall', provided by some local network.

2. Emission data: water, leachate and gas control

Sampling. For leachate and runoff water, a 10 litre global sample, representative of the average composition, should be available each month for monitoring. Reference: General guidelines on sampling technology, ISO 5667-2 (1988).

		Operating phase	After-care phase
2.1	Leachate volume	daily sum value	every 6 months
2.2	Leachate composition	monthly ⁽²⁾	every 6 months
2.3	Surface runoff water composition	monthly ⁽²⁾	every 6 months
2.4	Gas emissions (CH ₄ , CO ₂ , O ₂ , H ₂ S, H ₂ etc.)	monthly ⁽²⁾ ⁽³⁾	every 6 months idem ⁽⁴⁾

⁽¹⁾ The parameters to be measured and the substances to be analyzed vary according to the composition of the waste deposited; they must be laid down in the permit document and correlated to the eluate criteria of the landfilled wastes. Those chosen for the leachate should be such that estimates of the influence of the leachate on the barrier at the base of the landfill can be made from the annual evaluations.

⁽²⁾ The measures and analysis shall be carried out at least once a month during the first year of operation. If the evaluation of data indicates that longer intervals are equally effective, they may be increased to a maximum of three months. Conductivity must always be measured at least once a month.

⁽³⁾ CH₄, CO₂, O₂ regularly; other gases as required, according to the composition of the waste deposited.

⁽⁴⁾ Efficiency of the gas drainage layer must be checked regularly.

3. Protection of groundwater

A. Sampling

The number and location of the groundwater measuring points shall be laid down in the permit document; at least one measuring point shall be set up in the groundwater inflow region (0 level) and two in the outflow region. Reference value before starting in operation: A complete analysis, to be used as *initial reference value*, should be carried out at least at three locations. Reference: Sampling Groundwaters, Project for an international norm, draft, ISO/TC 147 SC6, 1988.

B. Monitoring

The substances to be analyzed shall be laid down on the basis of the leachate composition determined in the operating phase. Special surveillance shall be made on the concentrations of the substances taken into account in the annex (lists 1 and 2) of Council Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances.

For the substances of list 2 of Council Directive 80/68/EEC, and for groundwaters in use or usable as sources of drinkwater, the MAC values shall be those given in Council Directive 80/778/EEC on water for human consumption and the analytical methods, those proposed in the Annexes of the Directive.

	Operating phase	After-care phase
Levels of groundwater	every 6 months ⁽¹⁾	every 6 months
Groundwater composition	every 6 months	every 6 months

⁽¹⁾ If there are weaving groundwater levels the intervals shall be decreased.

For continuous monitoring, tracer parameters or components can be used, decided in function of the original characteristics of the groundwater (0 level) and of the composition of the leachate.

4. Waterbalance

Although the calculation of the water balance only has a theoretical value, it can be often a very convenient parameter for practical management purposes, during the operating phase. Frequency: twice a year (April—October). The measurement of parameters 1.1 to 1.5 (meteorological data), combined with the measurement of parameter 2.1 (leachate volume, in emission data), permits the estimation of the annual water balance in the landfill. A convenient calculation method for a landfill in operation phase could be:

$$L_0 = I - E - aW$$

with:

L_0 = free leachate retained at the site (equivalent to leachate production minus leachate leaving the site), in m^3 /annum;

I = total liquid input (precipitation plus liquid waste, plus any surface water inflow), in m^3 /annum;

E = evapotranspirative losses (evaporation plus minimal transpiration), in m^3 /annum;

a = absorptive capacity⁽¹⁾ of the waste, in m^3 /tonne of waste received;

W = weight of waste deposited, in tonnes/annum.

The effectiveness of the attenuating mechanisms in reducing pollution risks to an acceptable level both within the landfill and in the underlying strata, implies theoretically that the site is operated so that L_0 is negative or zero. An increasing positive value for L_0 implies leachate build-up in the site.

5. Topography of the site: data on the landfill body

		Operating phase	After-care phase
5.1.	Structure and composition of landfill body ⁽¹⁾	yearly	
5.2.	Settling behaviour of the level of the landfill body	yearly	yearly reading

⁽¹⁾ Data for the status plan of the concerned landfill: surface occupied by waste, volume and composition of waste, methods of depositing, time and duration of depositing, proof of stability of the body of the landfill, calculation of the depositing capacity still available at the landfill.

ANNEX IVa

A model for the fiche for the data to be provided on each landfill as required in Article 19 of this Directive is to be drawn up in accordance with the procedure of Article 18 of Directive 75/442/EEC no later than six months before the date of implementation of this Directive.

This fiche shall be included in the annexes of this Directive.

⁽¹⁾ Absorptive capacity: The maximum amount of liquid taken up and retained by unit weight of solid under specified conditions; usually the amount of liquid retained by unit weight of refuse in a landfill before leachate is emitted (or practically the residual humidity at the time of sampling).

COM(93) 275 final

DOCUMENTS**EN****14 05**

Catalogue number : CB-CO-93-305-EN-C

ISBN 92-77-56729-5
