

Landfill of waste

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Waste management hierarchy

According to the waste management hierarchy, landfilling is the least preferable option and should be limited to the necessary minimum.



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Objective of the landfill directive

Where waste needs to be landfilled, it must be sent to landfills which comply with the requirements of Directive 1999/31/EC on the landfill of waste.

The objective of the Directive is to prevent or reduce as far as possible negative effects on the environment, in particular on surface water, groundwater, soil, air, and on human health from the landfilling of waste by introducing stringent technical requirements for waste and landfills.



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EC

- Council Directive 99/31/EC of 26 April 1999 on the landfill of waste entered into force on 16.07.1999.
- Council Decision of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC (2003/33/ECn in the Member States was 16.07.2001.



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EC

➤ **Guidance on landfill gas control** – this non-binding guidance has been prepared in order to:

- help competent authorities improve methane collection through the enforcement of the Landfill Directive requirements;
- provide clarity on landfill gas control requirements within the context of the technical and regulatory requirements of the Landfill Directive;
- set out the most important criteria in ensuring effective collection, treatment and use of landfill gas.



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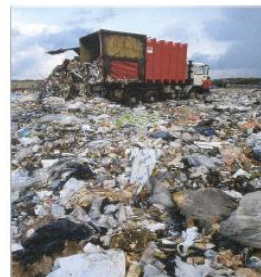


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IMPEL**Inspection guidance book for Landfill inspection**

*A practical book with guidance on activities on landfills
(2012)*

Inspection guidance
book for Landfill
inspection: A
practical book with
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European Union Network for
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The Landfill Directive defines the different categories of waste (municipal waste, hazardous waste, non-hazardous waste and inert waste) and applies to all landfills, defined as waste disposal sites for the deposit of waste onto or into land.



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The Directive does not apply to:

- the spreading on the soil of sludges (including sewage sludges and sludges resulting from dredging operations);
- the use in landfills of inert waste for redevelopment or restoration work;
- the deposit of unpolluted soil or of non-hazardous inert waste resulting from prospecting and extraction, treatment and storage of mineral resources as well as from the operation of quarries;
- the deposit of non-hazardous dredging sludges alongside small waterways from which they have been dredged and of non-hazardous sludges in surface water, including the bed and its subsoil.



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Landfills are divided into three classes

- landfills for hazardous waste
- landfills for non-hazardous waste
- landfills for inert waste



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Waste which will not decompose or burn, such as gravel, sand and stone

-) 'inert waste' means waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will 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 human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater;



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Key points

- waste must be treated before being landfilled;
- hazardous waste within the meaning of the Directive must be assigned to a hazardous waste landfill;
- landfills for non-hazardous waste must be used for municipal waste and for other non-hazardous waste;
- landfill sites for inert waste must be used only for inert waste;
- EU governments must implement national strategies to progressively reduce the amount of biodegradable waste sent to landfills.



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Waste acceptance procedures

- The holder: Basic characterisation of waste
- Testing
- At the landfill: Visual inspection of the waste & check the documentation (on-site verification)



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Waste acceptance criteria

- List of waste acceptable
- Limits of total content of organic parameters
- Leaching limits

The limits reflects the 3 classes of landfills

- Specific criteria for gypsum, asbestos



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The following wastes may not be accepted in a landfill:

- liquid waste;
- flammable waste;
- explosive or oxidizing waste;
- used tyres, with certain exceptions;
- hospital and other clinical waste which is infectious;
- any other type of waste which does not meet the acceptance criteria laid down in Annex II.



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Permit

Operators of landfill sites must apply for a permit and provide the following information:

- the identity of the applicant, and, in some cases, the operator;
- a description of the type and quantity of waste to be deposited;
- the capacity and a description of the site, including operating, monitoring and control plans;
- ways of preventing and reducing pollution; and
- details of closure and after-care procedures.



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National authorities must ensure that the price operators charge for disposing of the waste covers all the costs involved from opening to final closure of the site.



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A landfill must be situated and designed so as to meet the necessary conditions for preventing pollution of the soil, groundwater or surface water and ensuring efficient collection of leachate. Protection of soil, groundwater and surface water is to be achieved by the combination of a geological barrier and a bottom liner during the operational/active phase and by the combination of a geological barrier and a top liner during the passive phase/post closure.



Technical requirements

- The landfill base and sides shall consist of a mineral layer which satisfies permeability and thickness requirements with a combined effect in terms of protection of soil, groundwater and surface water at least equivalent to the one resulting from the following requirements:
 - landfills for hazardous waste: $K \leq 1,0 \times 10^{-9} \text{ m/s}$; thickness $> 5 \text{ m}$
 - landfills for non-hazardous waste: $K \leq 1,0 \times 10^{-9} \text{ m/s}$; thickness $\geq 1 \text{ m}$
 - landfills for inert waste $K \leq 1,0 \times 10^{-7} \text{ m/s}$; thickness $\geq 1 \text{ m}$



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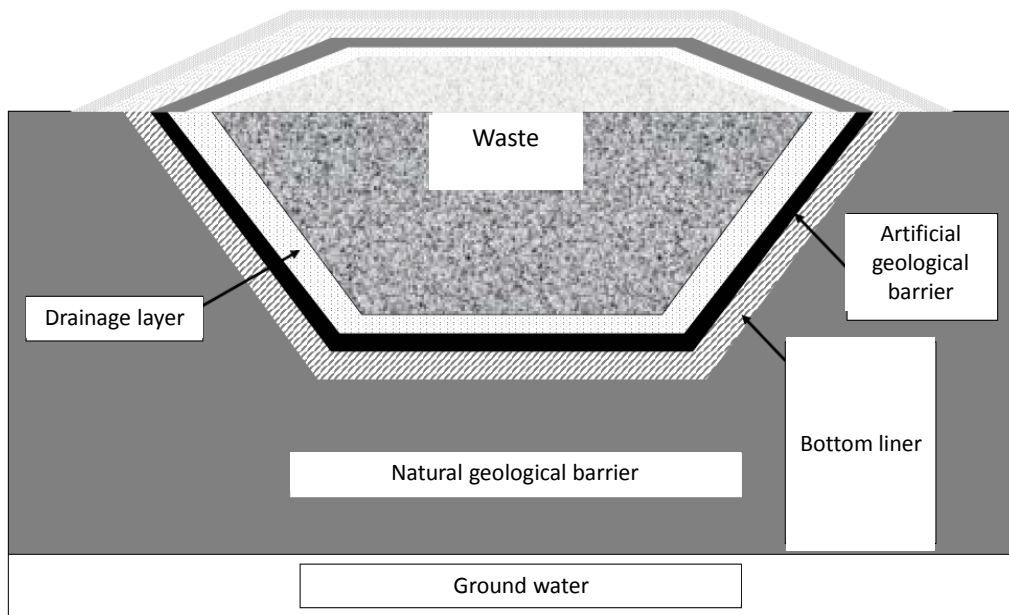
- Where the geological barrier does not naturally meet the above conditions it can be completed artificially and reinforced by other means giving equivalent protection. An artificially established geological barrier should be no less than 0,5 meters thick.



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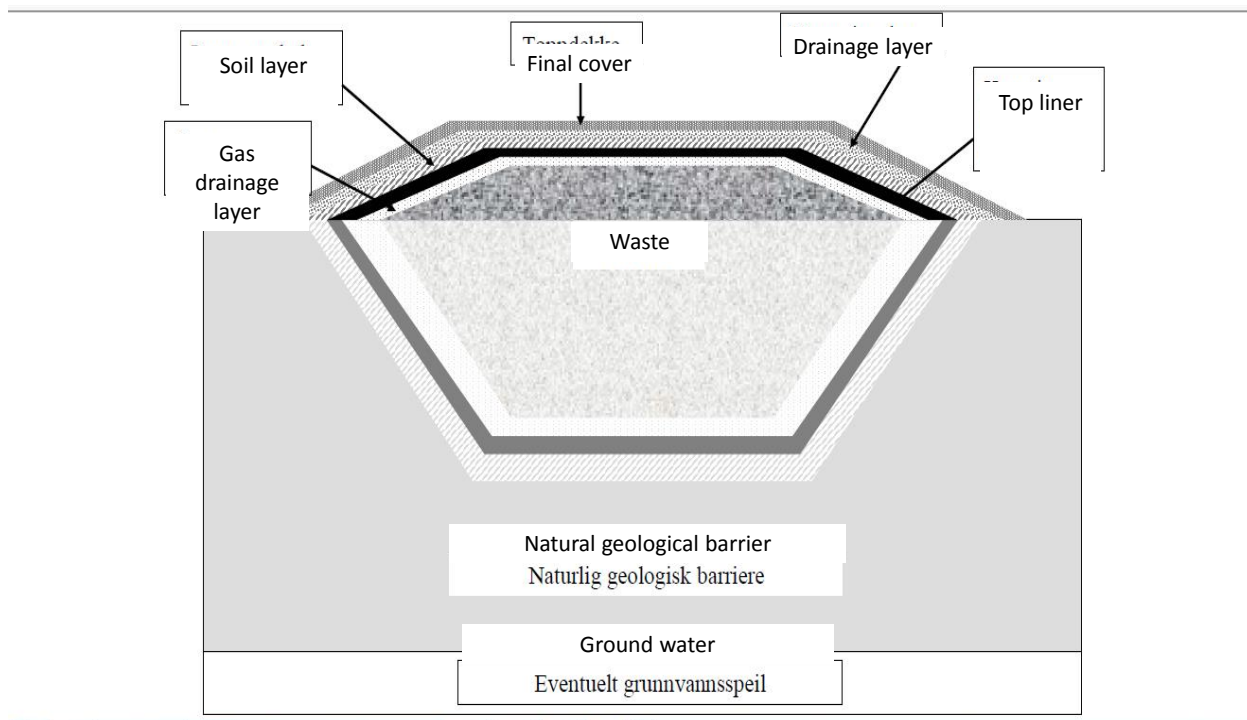
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The operator must...

- Control water entering into the landfill body
- Collect contaminated water and leachate
- Treat contaminated water and leachate



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Gas control

Landfill gas shall be collected from all landfills receiving biodegradable waste and the landfill gas must be treated and used. If the gas collected can not be used to produce energy, it must be flared.

The collection, treatment and use of landfill gas under paragraph 4.2 shall be carried on in a manner which minimises damage to or deterioration of the environment and risk to human health.



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General requirements for control and monitoring in operational phase and after-care

- A control and monitoring programme in operational phase
- A yearly reporting of the monitoring results to the competent authorities
- Maintenance, monitoring and control in the after-care phase for as long as may be required by the competent authority (30 years)
- Monitoring and analysing landfill gas and leachate and the ground water regime in the vicinity for the same time period



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Member States must ensure that existing landfill sites may not continue to operate unless they comply with the provisions of the Directive.



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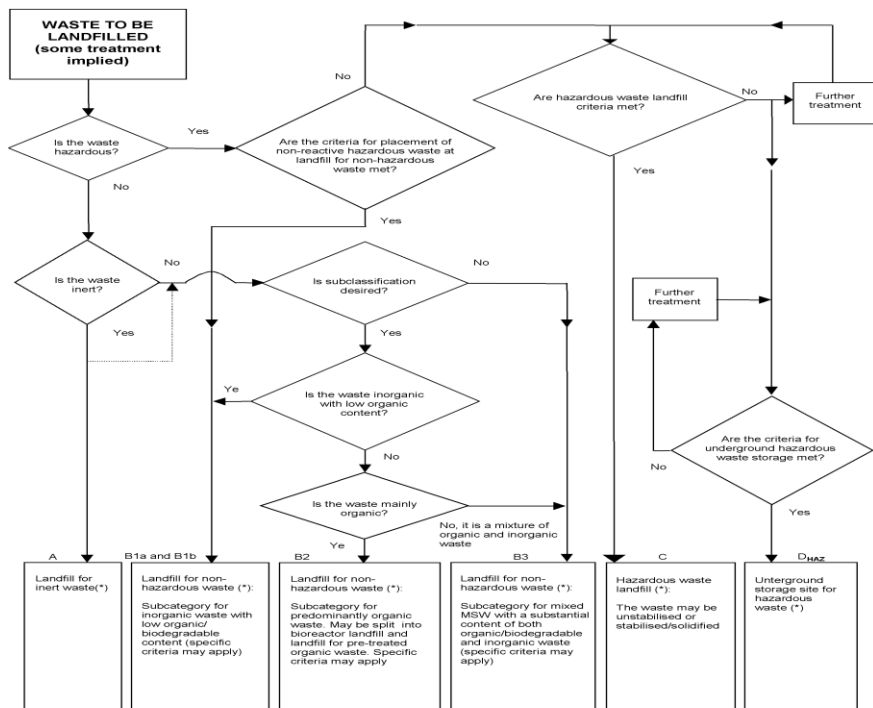
On 2 July 2014, the European Commission adopted a legislative proposal to review waste-related targets in the Landfill Directive as well as recycling and other waste-related targets in Directive 2008/98/EC on waste and Directive 94/62/EC on Packaging and Packaging Waste. The proposal aims at **phasing out landfilling by 2025 for recyclable waste (including plastics, paper, metals, glass and bio-waste) in non-hazardous waste landfills, corresponding to a maximum landfilling rate of 25%.**



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Thank you for your attention!
Questions?



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