Legal requirements for acceptance and control during operation of landfills

“Information Exchange Event on landfill of Waste“

Lisbon-Amadora, 13-14 May 2008

Council Directive 1999/31/EC on the landfill of waste

Overall Objective: Member States shall ensure that waste is disposed of without endangering human health and without using process or methods which could harm the environment (Art. 4, Waste Framework Directive 2006/12/EC)

- Annex I General requirements for all classes of landfills
- **Annex II Waste acceptance criteria and procedures (general principles and procedures) (Article 11)**
- Annex III Control and monitoring procedures in operation and after-care process (Article 12)

Taking into account general principles and procedures for testing and acceptance criteria as set out in Annex II the Commission is to adopt **specific criteria** and/or **test methods** and **associated limit values** should be set for each class of landfill (Article 16)

Basic requirements for landfill of waste

Waste may only be landfilled if compatible with the standards set for each landfill class!

(1) Procedure for the acceptance of waste at landfills (Article 1 / Annex I)

(2) Waste acceptance criteria (Article 2 / Annex II)

(3) Sampling and test methods (Article 3 / Annex III)

To be applied since July 2005

Procedure for the acceptance of waste at landfills

1. Basic characterisation of waste

2. Compliance testing

3. On-site verification

Records of information obtained have to be kept for a period to be defined by MS

Decision 2003/33/EC – Acceptance Procedures

Basic Characterisation of waste

- ✓Info on Source, Origin, source process, pre-treatment, composition, leaching behaviour, appearance, EWC, hazard properties, recipient landfill category, precautionary measures, exclusion check recycling/recovery
- ✓Testing leaching behaviour, composition

Compatibility with landfill acceptance criteria ?

Compliance testing

- ✓Periodical checks of regularly arising waste streams

On-site verification

- ✓Visual inspection
- ✓Periodic sampling at delivery to check compliance with accompanying documents

Records of information obtained to be kept for a period to be defined by MS

Acceptance procedure – basic characterisation

Basic characterisation

1. info on source and origin
2. source process
3. pre-treatment
4. composition
5. leaching behaviour
6. hazard properties
7. appearance
8. EWC,
9. recipient landfill category
10. precautionary measures
11. exclusion check recycling/recovery

- Task of waste producer Definition of **key variables**
- Full characterisation of waste; required for each type of waste

→ **Chemical analysis**

Compatibility with landfill acceptance criteria ?

yes → Waste is deemed to be acceptable at landfill class

no → Waste is not acceptable at landfill class

Acceptance procedure – compliance testing

Waste is deemed to be acceptable at landfill class

→ Compliance testing

Periodical checks of regularly arising waste streams

↓

Leaching test for key variables*

- Task of landfill operator
- At least once a year

Tests methods as used for basic characterisation shall be applied

(* = critical parameters as identified during basic characterisation)

Acceptance of waste at landfills – procedures in relation to waste characterisation

Wastes that are regularly generated in the same process

- Installation and process are well known
- Input materials and process are well defined
- Single installation or processes well known (e.g. incineration ashes)

Producer has to inform on changes

After one basic characterisation subsequently compliance testing of key variables may be sufficient

The basic characterisation then should especially contain the **compositional range** for the individual wastes and the **range and variability for characteristic properties**

Acceptance of waste at landfills – procedures in relation to waste characterisation

Wastes that are not regularly generated

➢Not part of a well characterised waste stream

→ Basic characterisation for each batch of waste

Acceptance procedure – on-site verification

For each load delivered to a landfill

→ On-site verification

Visual inspection before and after unloading

Check of required documents

Periodic sampling

- Task of landfill operator
- Testing requirements and rapid test methods determined by MS

On-site verification same result as basic characterisation and compliance testing

yes → Landfilled

no → Not accepted

Acceptance procedure for underground landfills (class D)

Site specific safety assessment

- Geological assessment
- Geomechanical assessment
- Hydrogeological assessment
- Geochemical assessment
- Biosphere impact assessment
- Assessment of the operational phase
- Long-term assessment
- Assessment of the impact of all the surface facilities at the site

Excluded from landfill:
wastes that may undergo undesired physical, chemical or biological transformation after they have been deposited

Testing requirements for inert waste landfill (class A)

Acceptable without testing:

Single waste streams (list) that are assumed to fulfil the criteria including:

Glass (101103, 150107, 170202, 191205, 200102)

Concrete (170101, 170107 selected only)

Bricks (170102, 170107 selected only)

Tiles and ceramics (170103, 170107 selected only)

Soil and stones (17050, 200202 selected only)

All other wastes have to be tested
(chemical analysis)
prior to be accepted

Testing requirements for inert waste landfill (class 0)

- Leaching limit values: heavy metals, acids, phenol index, DOC, TDS

  eg:

Component	L/S = 2 l/kg	L/S = 10 l/kg	C_o (percolation test)
	mg/kg dry substance	mg/kg dry substance	mg/l
Pb	0,2	0,5	0,15
DOC	240	500	160

- Limit values for total content of organic parameters: TOC, BTEX, PCB, mineral oil and PAHs, eg:

Component	Value mg/kg
TOC (total organic carbon)	30 000
PCBs (polychlorinated biphenyls 7 congeneres)	1

Testing requirements for non-hazardous waste landfill (class B) - I

Acceptable without testing:

- Municipal waste (household, similar to household) that is classified as non-hazardous in EWC (20)
- Separately collected non-hazardous fractions of household or same material from other origin

These wastes may not be admitted to class B landfills:

- if not subjected to prior treatment or
- if contaminated to an extent which increases the associated risk sufficiently to justify disposal in other facilities

- Construction material containing asbestos and other suitable asbestos waste (if stable & non-reactive, no other hazardous substances, not with biodegradable, separate cell, daily coverage, final topping)

All other wastes have to be tested prior to be accepted

Testing requirements for non-hazardous waste landfill (class B) - II

Granular **non-hazardous** waste accepted **in same cell as stable non-reactive hazardous waste**	Non-hazardous gypsum waste (only in cells where no biodegrdable waste is accepted)	Granular **hazardous waste** acceptable at class B landfills
Limit values	Limit values for **wastes to be landfilled together with gypsum-based** material	**Leaching** limit values
Heavy metals, chloride, fluoride, sulphate, DOC, TDS (alternative to sulphate, cloride)	TOC 5% DOC 800 mg/kg d.m.	Heavy metals, chloride, fluoride, sulphate, DOC, TDS (alternative to sulphate, cloride)

Testing requirements for non-hazardous waste landfill (class B) - III

- Leaching limit values for heavy metals, acids, DOC and TDS, eg (granular waste)

Component	L/S = 2 l/kg	L/S = 10 l/kg	C_o (percolation test)
	mg/kg dry substance	mg/kg dry substance	mg/l
Pb	5	10	3
DOC	380	800	250

- Additional criteria for stable, non-reactive hazardous waste: TOC, pH, ANC
- For monolithic waste MS shall set criteria

Member States may create subcategories of landfills for non hazardous waste

Testing requirements for hazardous waste landfill (class C)

- All wastes have to be tested prior to acceptance

- Leaching limit values for heavy metals, acids, DOC and TDS, eg (granular waste)

Component	L/S = 2 l/kg	L/S = 10 l/kg	C_o (percolation test)
	mg/kg dry substance	mg/kg dry substance	mg/l
Pb	25	50	15
DOC	480	1 000	320

- Additional criteria: LOI or TOC, ANC

- For monolithic waste MS shall set criteria

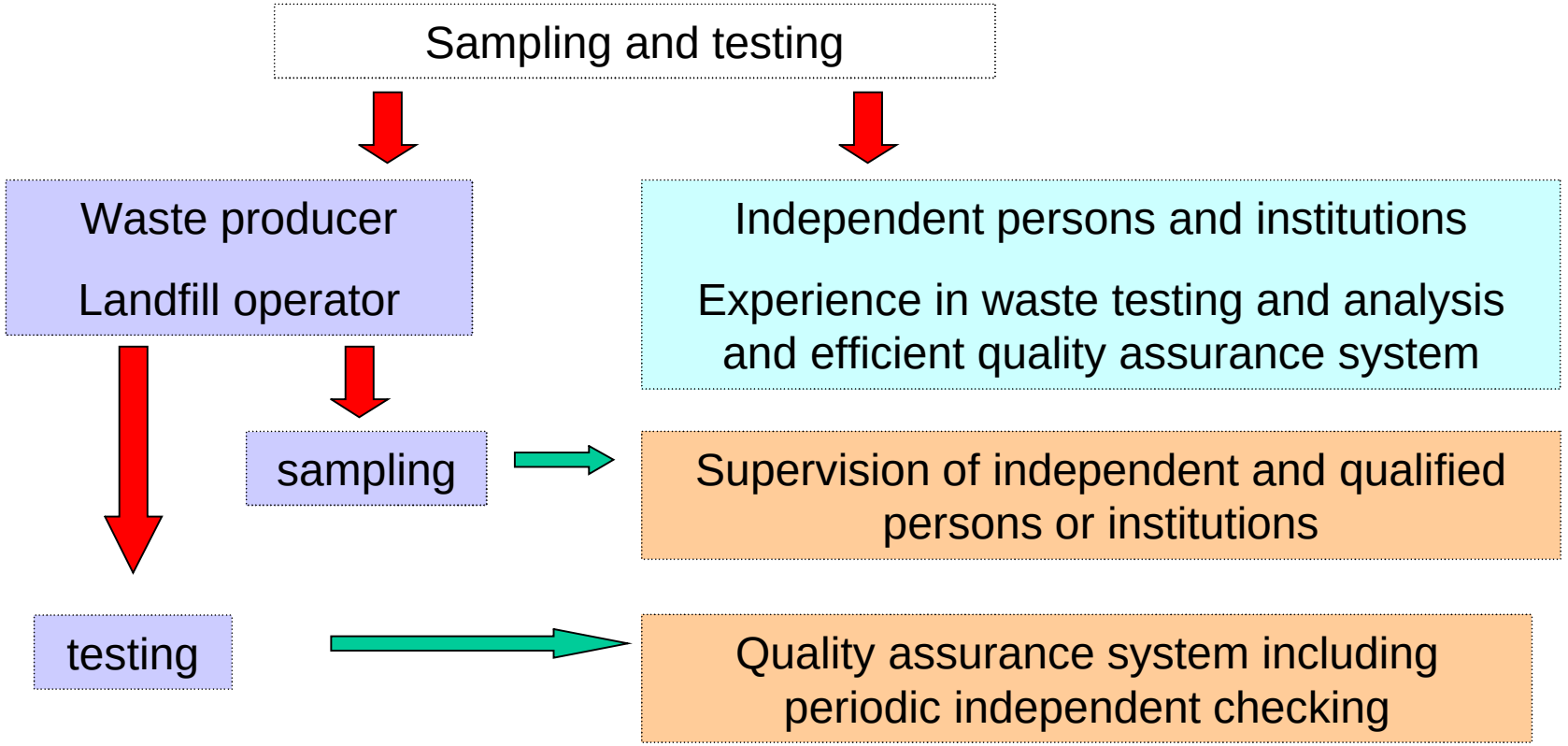
Testing requirements for underground landfills (class D)

Inert waste → limit values according to landfill for inert waste

Non-hazardous waste → limit values according to landfill for non-hazardous waste

Hazardous waste → waste compatible with site-specific safety assessment

Decision 2003/33/EC – Sampling and test methods



Sampling and testing according to methods listed in Annex III of Decision 2003/33/EC (developed by CEN)

Decision 2003/33/EC – Sampling and test methods

- **EN 14899: Framework for the application and preparation of a Sampling Plan**

- EN 123137: Determination TOC
- EN 14429: Determination DOC
- prEN 14405, EN 12457/1-4 : Leaching
- prEN 14346: Calculation dry matter
- EN 13657, EN 13656: digestion of raw waste
- ENV 12506, ENV 13370, prEN 14039: analysis

etc.

Problems and Deficits in Implementation of EN 14899

(1) What sampling regime is needed to reliably assess characteristics and variability of a waste stream?

(2) How is it possible to generate a sample representative for a certain period of time?

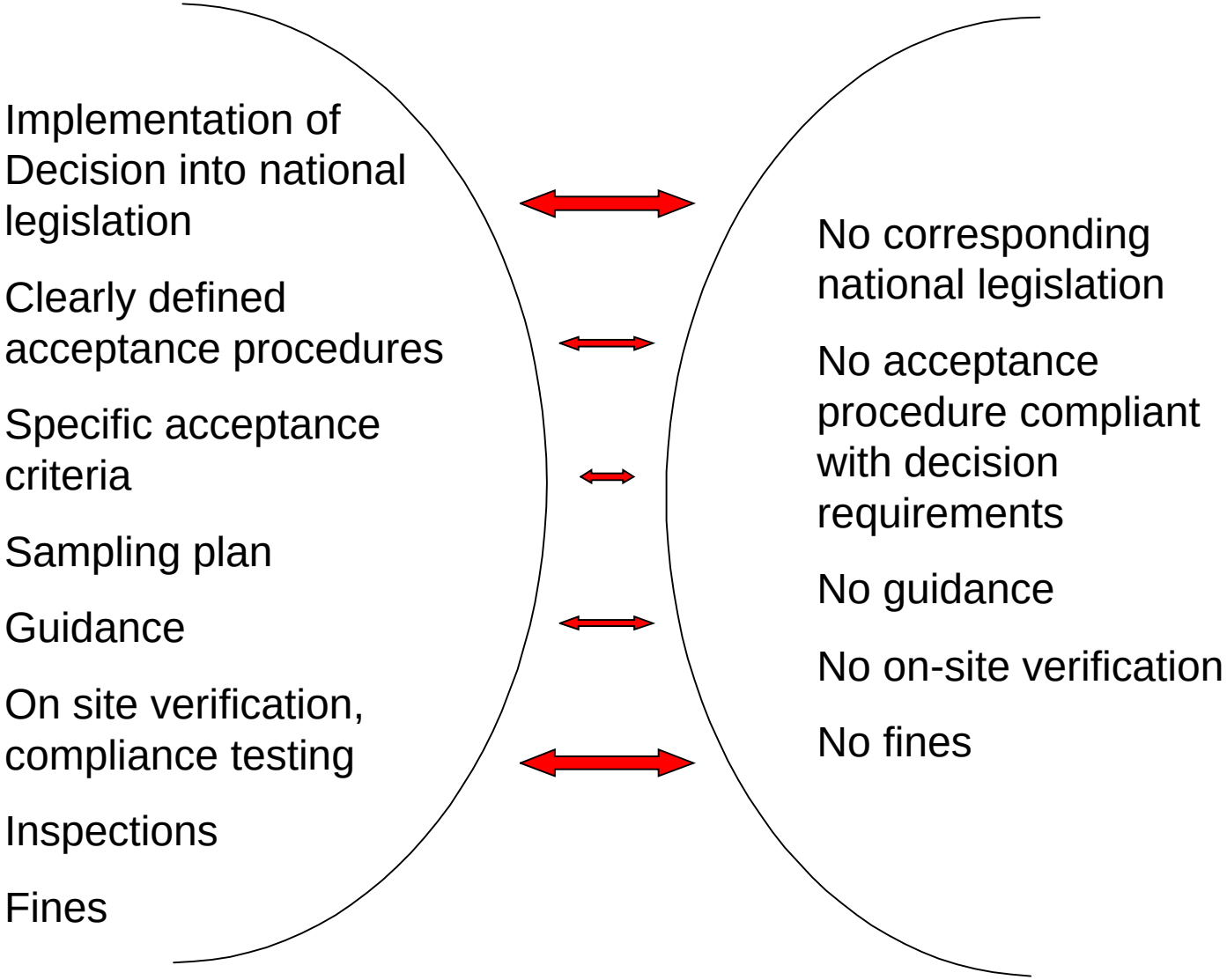
(3) How to manage aspects of storage until test result are available?

High uncertainty

Cost and feasibility aspects

Diverging interpretation

Range of Implementation



In general implementation incomplete

Joint actions & constructive discussions

- Meetings at local, regional, national level
- TAC meetings
- IMPEL Working Group

IMPEL Cluster 1 – "Comparison programme for landfill inspection and monitoring"

- Support Member States for a consistent level of enforcement;
- Set up exchange of information, knowledge and practical experiences
- Provide an easily accessible EU enforcement project for all Member States;
- Create an informal network of inspectors
- Improve collaboration between the different competent authorities and enforcement partners.

Lead country:Austria

Project start January 2008

Project Manager

Mr Mag. Franz Mochty e-mail: Franz.Mochty@Lebensministerium.at

Ministry of Agriculture, Forestry, Environment and Water Management

Focus – “Comparison programme for landfill inspection and monitoring”

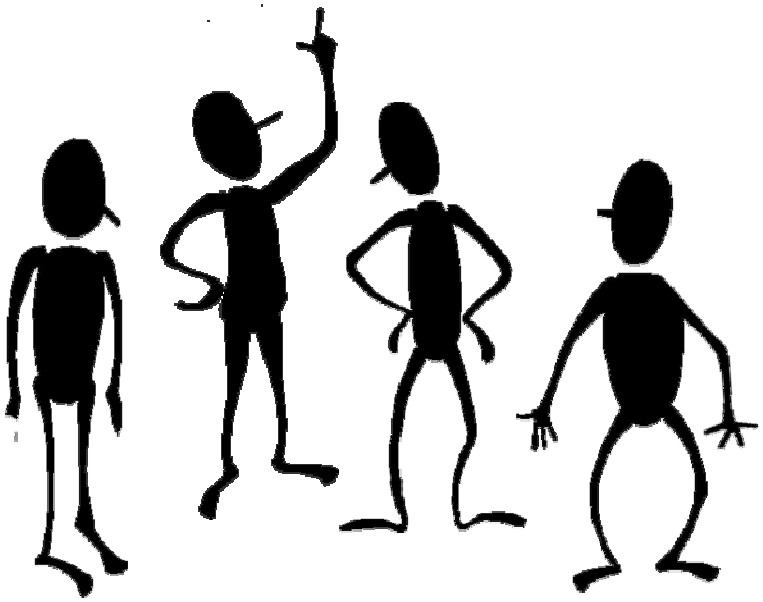
Basic characterisation:

- Determination of compositional range for the individual wastes
- Determination of range and variability for characteristic properties
- Elaboration of sampling plan

Acceptance procedure on-site

Aspects to discuss

1. How do you perform basic characterisation for inert, municipal and hazardous waste?
2. How is compliance testing assured?
3. How is on-site verification performed?
4. Where are difficulties encountered?
5. What solutions have been developed?



Thank you for your attention