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Waste Acceptance Criteria, critical parameters, frequency, cost-efficiency

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Contents

- Logic behind the WAC
- Transposition into national regulations
- Dutch considerations and solutions
- Conclusions and recommendations

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Landfill Directive considerations

- (6): 'landfill should be adequately … managed to **prevent or reduce potential adverse effects to the environment and risks to human health**'
- (7): '.. it must be possible to monitor landfill sites with respect to the substances …., whereas such substances **should .. react only in foreseeable ways**'
- (20): '.. in order to prevent threats to the environment, it is necessary to introduce a uniform waste acceptance procedure..'

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Waste Acceptance Criteria

- Council Decision of 19 December 2002 established criteria and procedures for the acceptance of waste at landfills
- 'Composition, leachability, **long-term behaviour** and general properties of a waste must be known as precisely as possible...'
- Leaching limit values were introduced with regard to groundwater protection: source – path – threatened object
- It is essentially a risk assessment method
- Backward modelling from a point of compliance

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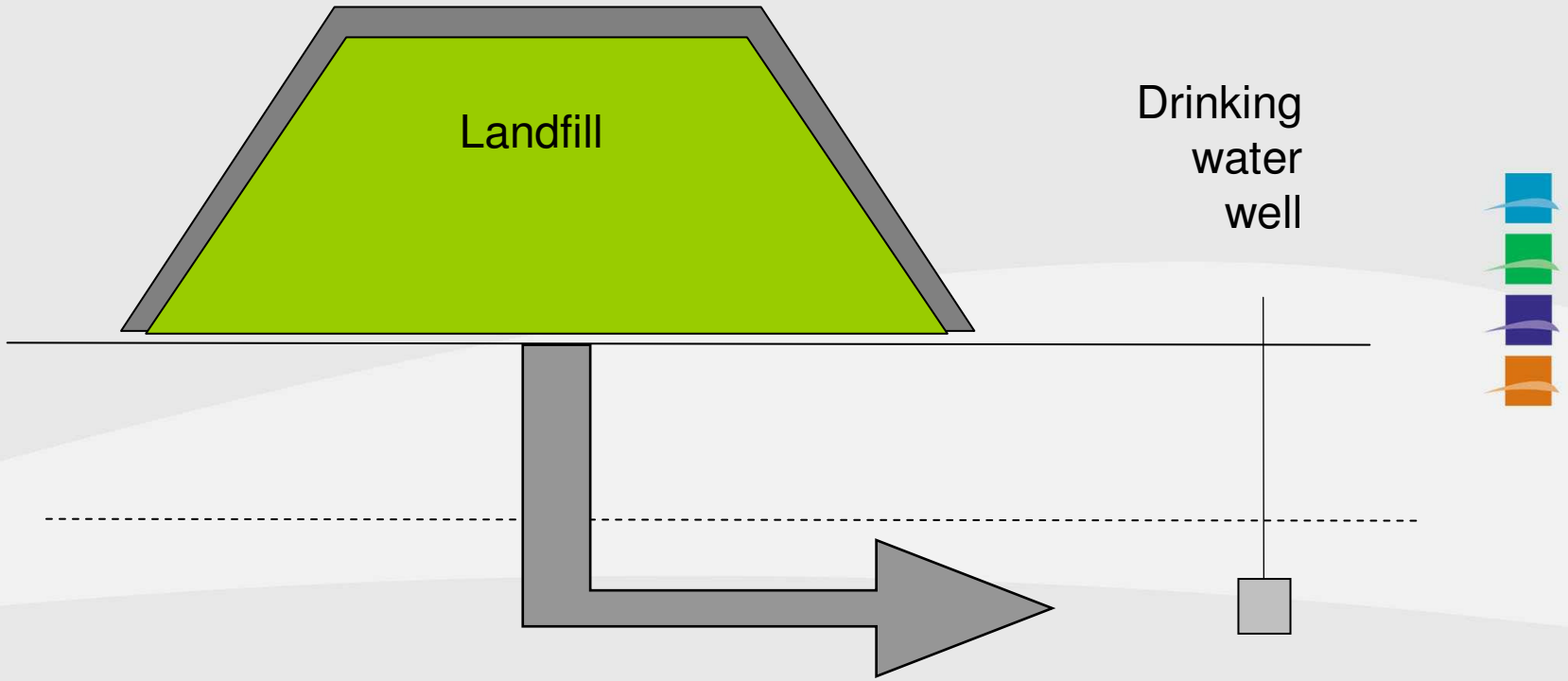
Establishment of WAC



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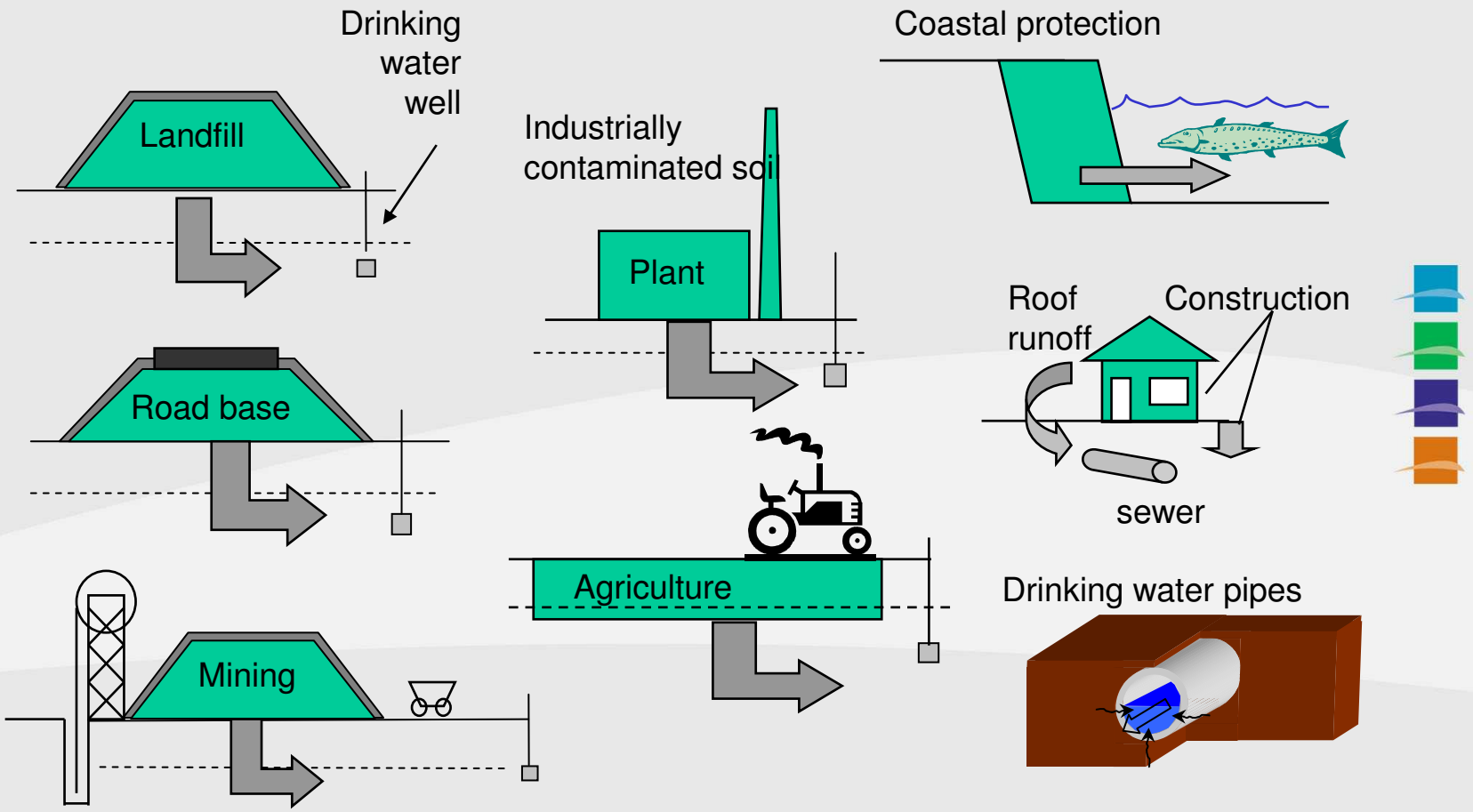
Different scenarios, same problem



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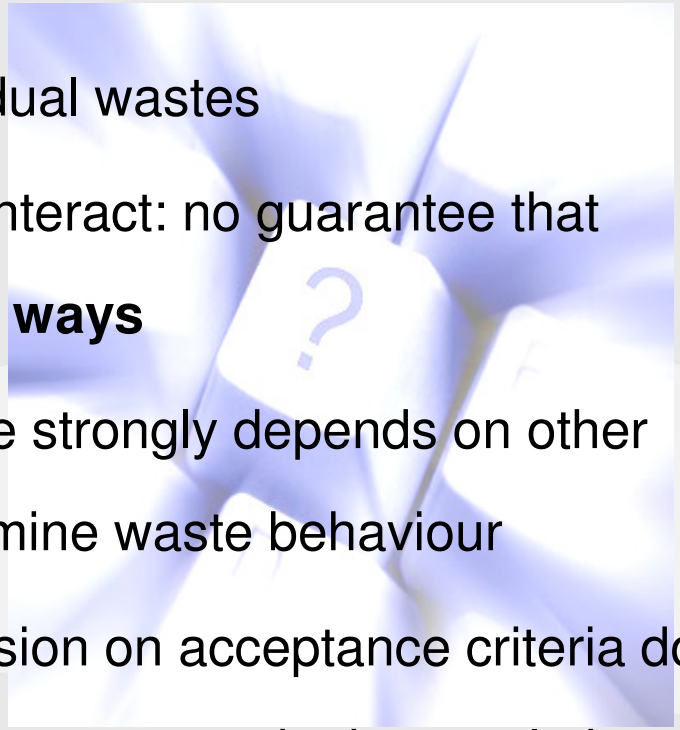
WAC fulfilling ambitions?



- Acceptance criteria relate to individual wastes
- No reference (yet) to how wastes interact: no guarantee that **wastes only react in foreseeable ways**
- The **long-term behaviour** of waste strongly depends on other wastes: no guidance (yet) to determine waste behaviour
- Landfill Directive and Council Decision on acceptance criteria do not (yet) completely fulfil the ambitions set out in the regulations

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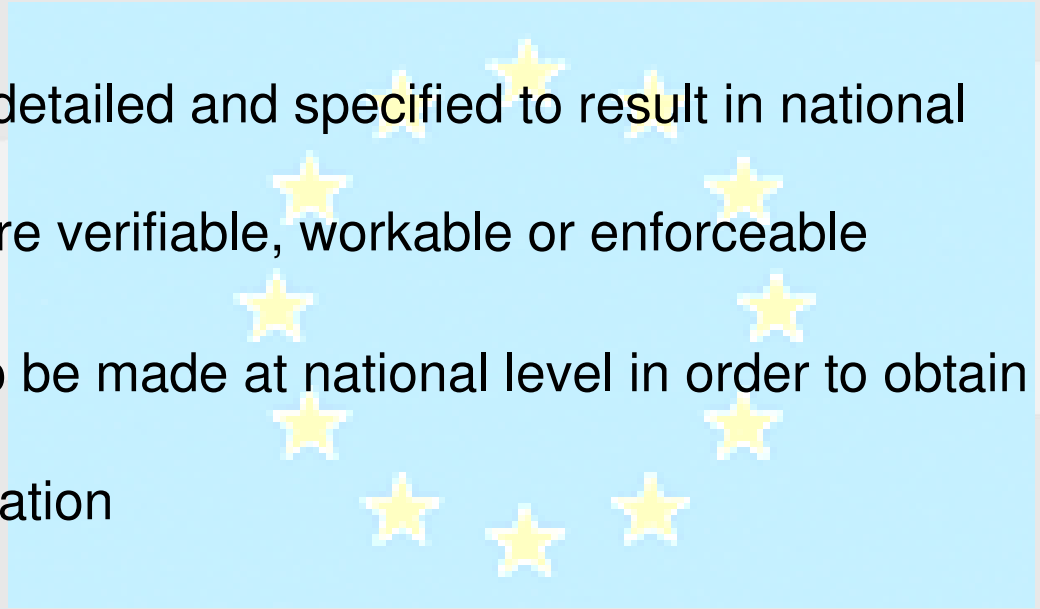
Transposition of WAC

- It is a very complicated piece of regulation
- It leaves a lot of room for interpretation
- It is insufficiently detailed and specified to result in national regulations that are verifiable, workable or enforceable
- Decisions have to be made at national level in order to obtain enforceable regulation



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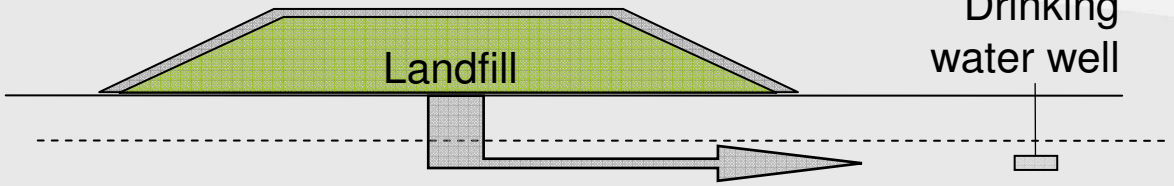
Dutch considerations

- Important: goal is to protect soil and groundwater, NOT to know everything of every batch of waste landfilled
- Comparable acceptance procedures exist since 1995
- All operational landfills have high protection standards
- Chosen for the most simple and pragmatic interpretation



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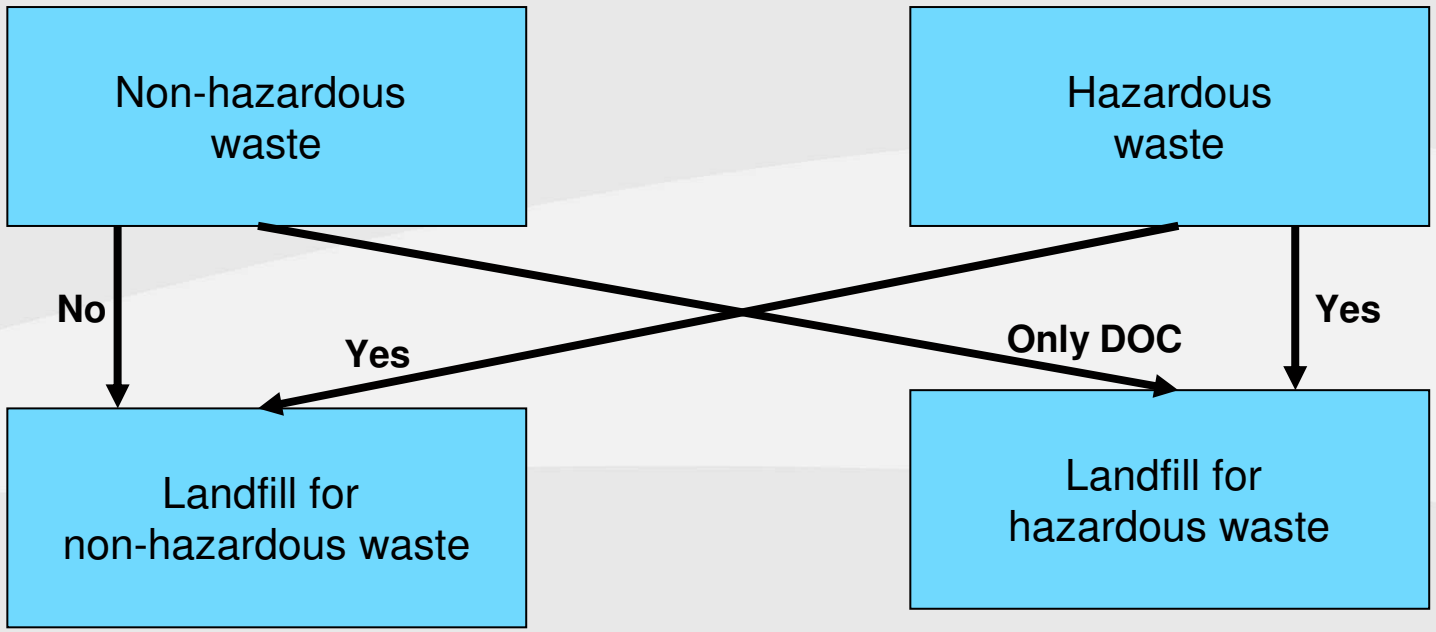
To test or not to test?

- Dutch estimate: maximum 15% of wastes will be tested



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Cost efficiency

- Limit the number of samples
- Limit the types of waste to be tested
- Only granular wastes:

  >80% >40 mm → no test methods available
- Exclude wastes for which information is available
- Positive list of stable, non-reactive hazardous wastes

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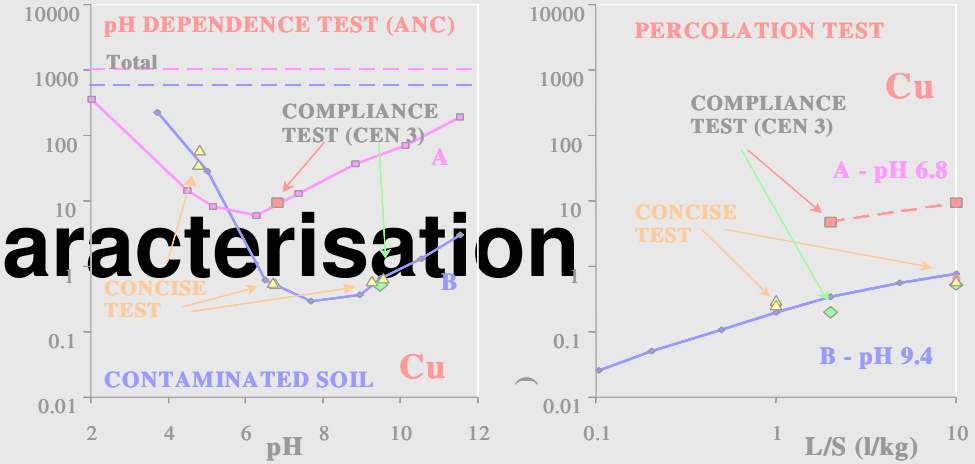

Basic characterisation

- Independent sampling by certified organisation
- One basic characterisation for each batch (up to 4,000 tonne)
- 50 subsamples compiled into 1 sample for testing = good
- No distinction between waste regularly generated and waste not regularly generated → less mistakes
- Analysis of all parameters for which limit values exist

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Evaluation

- Comparison of test results with leaching limit values
- If parameters comply: landfill of batch is allowed
- Assess variation of 5 basic characterisations
- If all averages comply with all limit values, then the waste can be landfilled without further basic characterisation
- If the process changes: new basic characterisation

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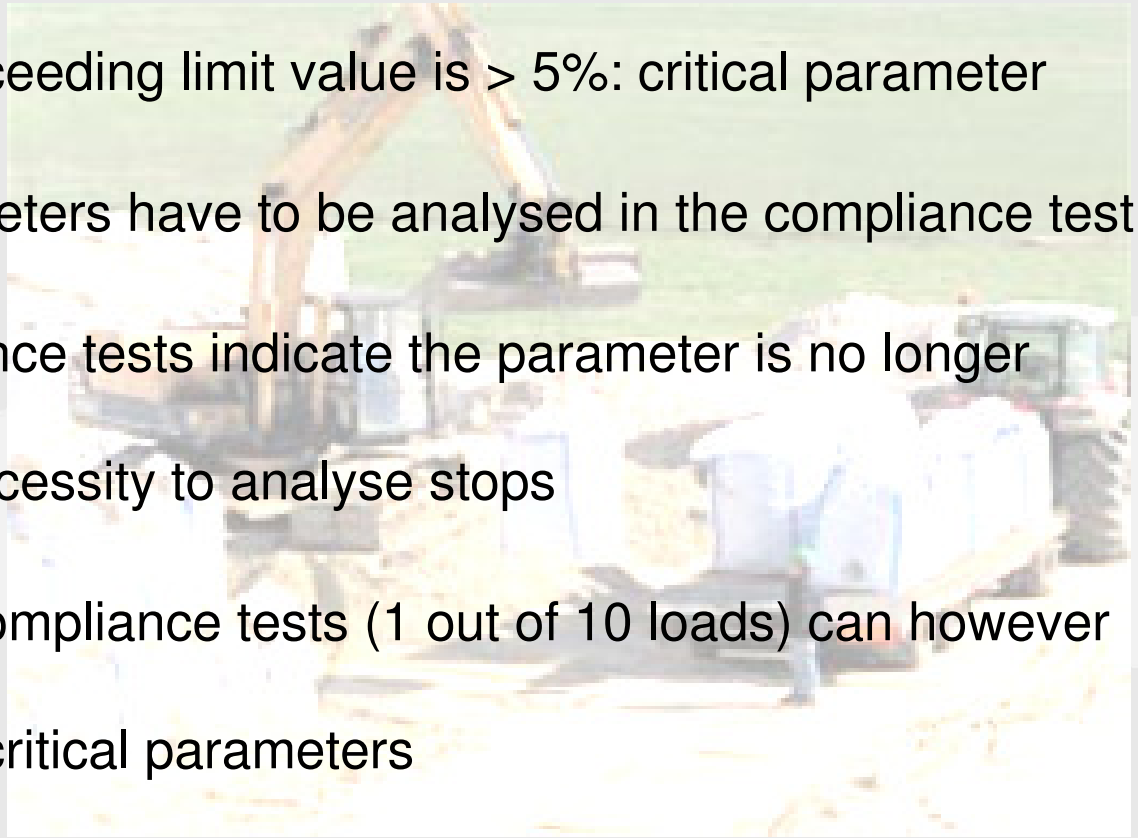
Identification of critical parameters

- Chance of exceeding limit value is > 5%: critical parameter
- Critical parameters have to be analysed in the compliance test
- If the compliance tests indicate the parameter is no longer critical, the necessity to analyse stops
- The regular compliance tests (1 out of 10 loads) can however result in new critical parameters



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Compliance testing: frequency

% of units that exceed	Sampling frequency	Number of loads to be evaluated together
< 5%	No testing	n.a.
5% < x < 10%	1 of 10 loads	100
10% < x < 30%	1 of 6 loads	60
30% < x < 50%	1 of 2 loads	20
> 50%	Every load	10

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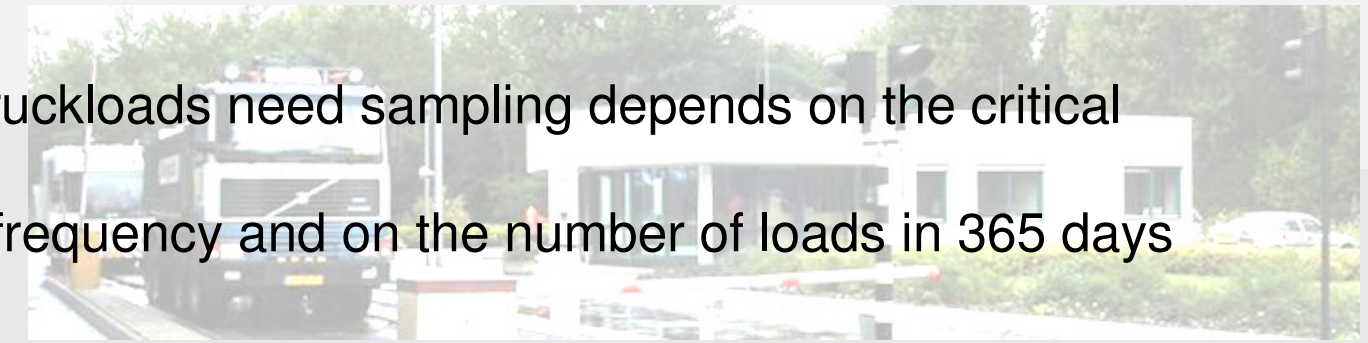
Compliance testing: sampling

- Sampling procedures have to be simple!
- The basis for sampling is a truckload: 5 samples per load
- A compiled sample consists of 50 subsamples (= 10 truckloads) or all subsamples compiled within 365 days
- Which 10 truckloads need sampling depends on the critical parameter frequency and on the number of loads in 365 days



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Compliance testing: sampling

- First truckload after basic characterisation / compliance sample
- Next sample: depends on the critical parameter frequency
- Landfill operator records selection method and selected loads
- Maximum is every truck load and minimum is every tenth truck load or 50 samples every 4,000 tonnes (ships, storage)

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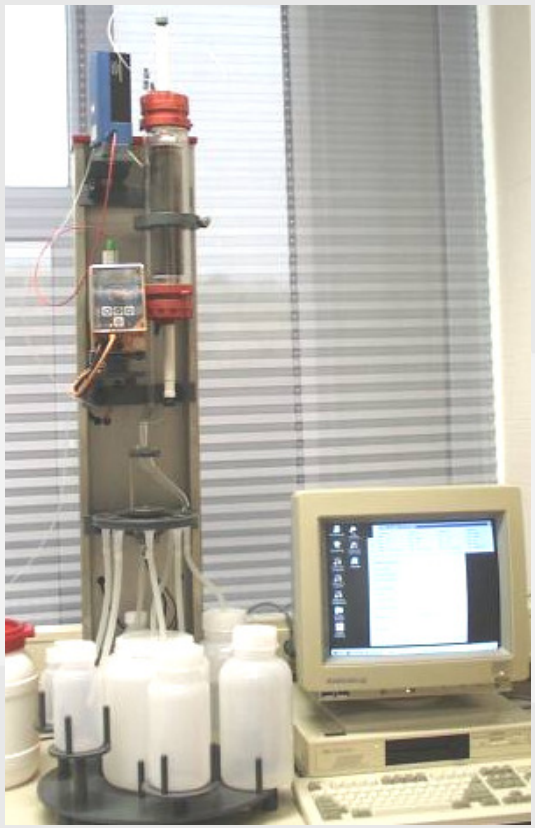
Compliance testing: analysis

- At least one compliance test per type of waste per 365 days
- Clustering → several contracts
- After 10 sampled truck loads or 365 days after the first sample a compiled sample is sent to the laboratory



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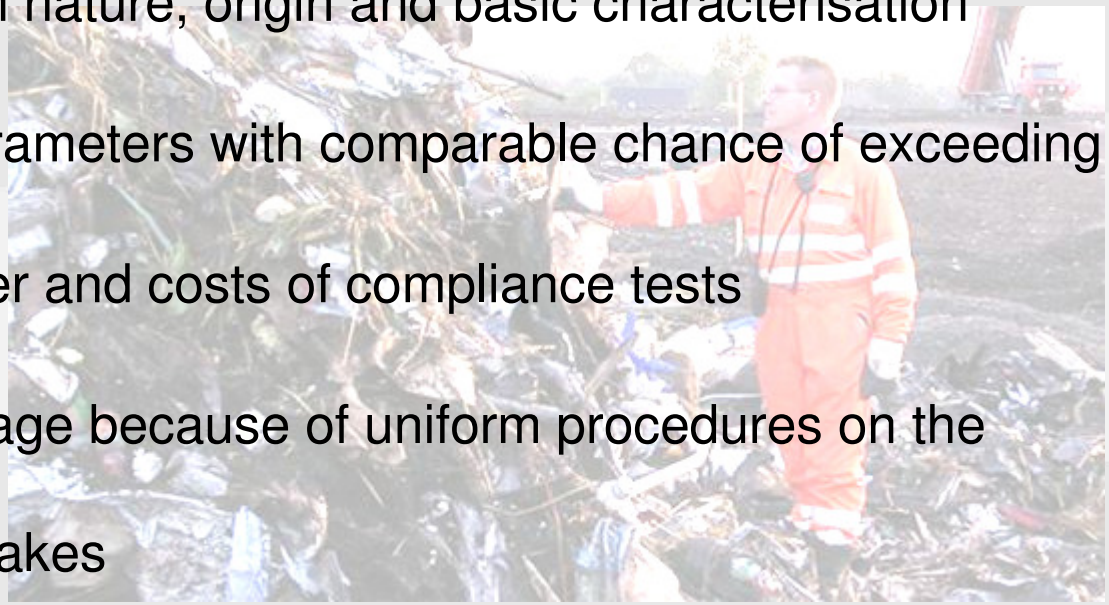
Compliance testing: clustering

- Comparable wastes may be clustered by the landfill operator
- This is judged on nature, origin and basic characterisation
- Same critical parameters with comparable chance of exceeding
- Limits the number and costs of compliance tests
- Practical advantage because of uniform procedures on the landfill: less mistakes



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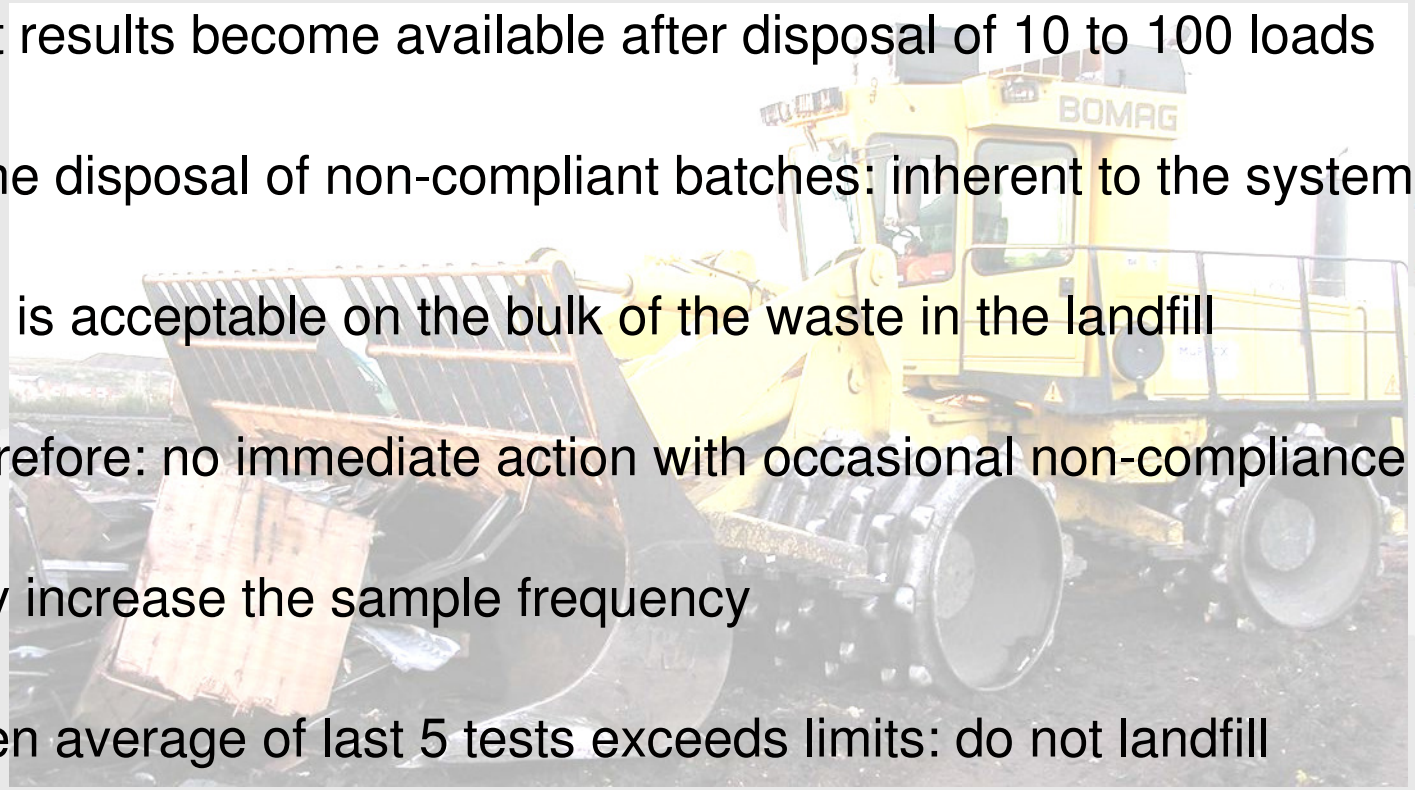
Compliance testing: evaluation



- Test results become available after disposal of 10 to 100 loads
- Some disposal of non-compliant batches: inherent to the system
- This is acceptable on the bulk of the waste in the landfill
- Therefore: no immediate action with occasional non-compliance
- Only increase the sample frequency
- When average of last 5 tests exceeds limits: do not landfill

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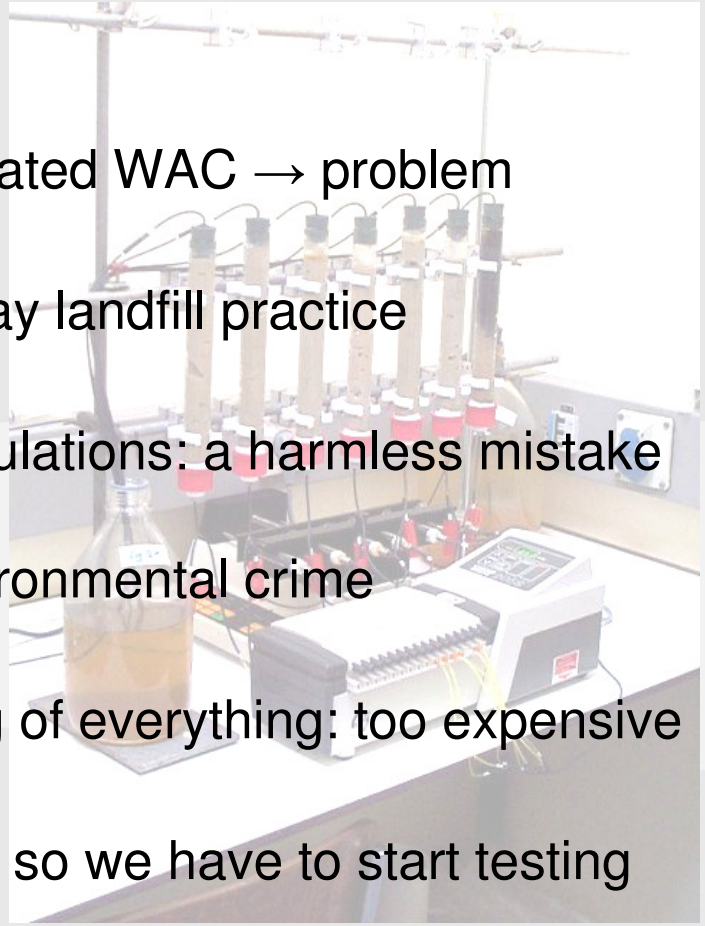
Conclusions and recommendations



- If your government has only translated WAC → problem
- Look for solutions close to everyday landfill practice
- Avoid too detailed or stringent regulations: a harmless mistake is (on paper!) immediately an environmental crime
- Avoid most comprehensive testing of everything: too expensive
- But: we do need more knowledge, so we have to start testing

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Thank you very much for your attention