



Rijkswaterstaat
*Ministry of Infrastructure and the
Environment*

Dredged material management and assessment in the NL

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Situation on dredged in the Netherlands

Dredging is necessary for navigation, drainage, flood control and environment/ecology



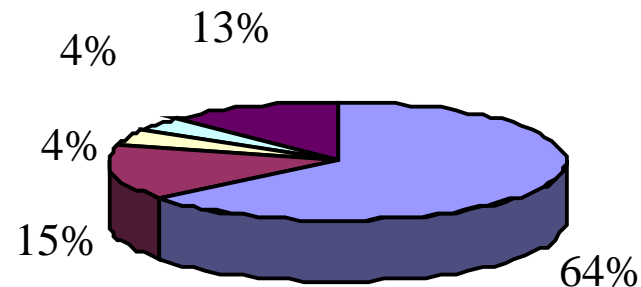
material management

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25-35 million m³/year

excluding coastal defence and capital dredging

destinations of dredged material



■ relocation in sea ■ placement on land ■ direct reuse
■ treatment & reuse ■ confined disposal



Developments

About 10 years ago the main problems were:

- lack of destinations for dredged material
- inconsistent risk assessment of contaminated sediments
- negative image of dredged material

Actions undertaken:

1. Construction of additional CDF (Hollandsch Diep)
2. Large scale pilot for treatment and use of contaminated dredged material
3. Change in legislation for use of dredged material (Soil Quality Act)
4. Legislation for rehabilitation of pits with dredged material
5. Change in risk assessment for contaminated sediments based on a shift from soil to water legislation and leading to a change in remediation criteria based on the WFD
6. Change in action levels for relocation at sea (only chemical criteria, no bio-assays)

Confined Disposal



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Facilities RWS

Confined disposal facility
Slufter (1987, 90 mio
 m^3) with Port Authority
of Rotterdam



Cdf IJsseloog (2002, 20 mio m^3)

Cdf Hollandsch Diep (2008, 10 mio m^3)



Supply of dredged material and capacity of CDFs

Trend of decreasing volume of dredged material for disposal

- Successful emission policy which led to a significant improvement of sediment quality
- Increase in possibilities for use of dredged material due to new legislation
- Change of remediation criteria, which led to a lower volume of contaminated dredged material

Capacity of CDFs

- CDFs have a large buffer capacity
- Options for more efficient management of CDFs on the long term are considered



Treatment and use of dredged material

- Conclusion of large scale pilot (2004-2009) is that treatment and use of contaminated dredged material in the Netherlands is, for most types of dredged material, technical feasible but is in general no economic viable alternative to disposal in a CDF
- Less need for treatment because of increase of possibilities for direct use of dredged material due to new legislation
- Treatment of dredged material is no longer a policy objective, but use of dredged material remains a policy objective
- Case by case decision by water manager for the most efficient solution

Soil Quality Act: Chemical Standards for dredged material



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Disposal/Waste

Environmental risks
(remediation)

*Site-specific risk assessment of
contaminated sediments*

Site specific

Intervention-level

*Distinction hotspots and
diffuse contamination of sediments*

Class B

Actual level

*Background quality of
sediments in River Rhine*

Class A

Background

No restrictions for use

Use/Resource



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Use of dredged material for ecological rehabilitation of deep pits

Public concern
Guidance document
for implementation of
legislation (Soil
Quality Act)





Remediation criteria for contaminated sediments

- Bio-availability of contaminants is the key factor for risk assessment.
- Total amounts of contaminants are helpful for source control (reduction of pollution) but are a poor measure for risks.
- Starting point is the quality of the water system instead of local soil quality.
- Shift from soil legislation (Soil Protection Act) to water legislation (Water Act).
- Remediation is considered if contaminated sediments are the cause that chemical and ecological quality targets of the water system are not achieved (Water Framework Directive).
- Programme for Remediation of contaminated sediments is now integrated in the program of measures for the WFD.
- Guidance document for new approach.



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Actions levels for relocation at sea

- In addition to chemical standards bio-assays were considered during a test period, but not implemented, because of insufficient reliability
- Small changes in action levels may have large consequences in volumes of dredged material to be disposed
- Large problems are not foreseen and our CDFs have a buffer capacity



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Challenges now and in the future

- Negative risk perception of dredged material
- Increasing costs because of trend for more detailed regulations
- Time consuming environmental procedures



Negative risk perception of dredged material

Problem	<p>Negative risk perception of dredged material</p> <p>Dredged material is regarded as toxic, regardless of its characteristics.</p> <p>In case of contamination, only total contents are presented in a worst case scenario.</p>
Way forward	<p>Take site-specific conditions into account.</p> <p>Appropriate use of knowledge on bio-availability of contaminants for risk assessment of contaminated sediments</p>
	<p>Consultation and information of public and stakeholders on the actual environmental risks of contaminated sediments/dredged material</p>



Increasing costs because of trend for more detailed regulations

Problem	Elaboration of legislation into detailed complex specifications
Consequences	May hamper tailor-made solutions Less flexibility for contractor High costs Suboptimal solutions
Way forward	More understanding between regulators and practitioners on the implementation and interpretation of regulation



Time consuming environmental procedures

Problem	Time consuming environmental procedures
Regulation from different sectors: Water, soil, waste, spatial planning	Complex patchwork of regulations, in some cases contradictions
Demands from European Directives Bird & Habitat/Nature 2000 Water Framework Directive	Environmental restraints for dredging, mitigation and compensation measures may be necessary
Way forward	Integrate environmental and technical specifications from the very start Eco-Engineering or Working with nature



Outlook

- In the Netherlands a large number of actions have been undertaken to tackle problems of dredged material management and assessment
- The main issues have been solved and are in control
- Remaining challenges are negative risk perception of dredged material, increasing costs due to complexity of legislation and time consuming procedures
- The approach of Eco-Engineering or Working with Nature looks promising to realise tailor-made solutions and reduce environmental procedures and costs