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Situation on dredged material management in the Netherlands

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

- **64%** relocation in sea
- **13%** placement on land
- **15%** direct reuse
- **4%** treatment & reuse
- **4%** confined disposal

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

Rijkswaterstaat Ministry of Infrastructure and the Environment

25-35 million m$^3$/year excluding coastal defence and capital dredging.
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

Confined disposal facility Slufter (1987, 90 mio m³) with Port Authority of Rotterdam

Cdf IJsseloog (2002, 20 mio m³)  Cdf Hollandsch Diep (2008, 10 mio m³)
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

- **Disposal/Waste**
  - **Class B**
    - Intervention-level
  - **Class A**
    - Actual level
  - **Background**
    - No restrictions for use

- **Use/Resource**
  - **Environmental risks** (remediation)
  - **Site specific**
    - Distinction hotspots and diffuse contamination of sediments
  - **Site-specific risk assessment of contaminated sediments**
  - **Background quality of sediments in River Rhine**

Rijkswaterstaat
Ministry of Infrastructure and the Environment
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.
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.
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 | Negative risk perception of dredged material  
Dredged material is regarded as toxic, regardless of its characteristics.  
In case of contamination, only total contents are presented in a worst case scenario. |
| Way forward | Take site-specific conditions into account.  
Appropriate use of knowledge on bio-availability of contaminants for risk assessment of contaminated sediments |
| Consultation and information of public and stakeholders on the actual environmental risks of contaminated sediments/dredged material |
Increasing costs because of trend for more detailed regulations

<table>
<thead>
<tr>
<th>Problem</th>
<th>Elaboration of legislation into detailed complex specifications</th>
</tr>
</thead>
</table>
| 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

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