Large Scale Sediment Management
Introduction

The Netherlands:
1. CDF IJsseloog
2. Regional Processing: DWR Amsterdam
3. CDF Slufter

Northern America:
1. Miami River Project
2. Fox River Cleanup
Boskalis Dolman is a full subsidiary of Royal Boskalis Westminster NV, a world wide operating dredging company and market leader in the world of ‘wet’ Infrastructure.

Stuyvesant Environmental Contracting is the North America based affiliate.
A specialized, experienced player in the niche market of environmental activities

- Contaminated Soil Processing
- Dredged Sediment Processing
- Remediation Works
- Brownfield Development
- Beneficial Use
- Regional Treatment Centers
- MSDP: Mobile Separation & Dewatering Plant
- Geotechnical Laboratory
- 10 million tons experience in soil treatment
Highlighted locations in The Netherlands

- IJsseloog
- DWR Amsterdam
- Slufter (maasvlakte)
IJsseloog

- Estuary of River IJssel
- Branch of River Rijn
- Start in Graubünden (Switzerland)
- Total length 1.320 km (IJssel ~125 km)
- Watershed 185,000 m²
- Heavy industrialized areas
IJsseloog

- Initially for cleanup of mouth of River IJssel
- About 2,800 hectare was contaminated due to deposits from the IJssel River.
- Local CDF (Contained Disposal Facility) was constructed
- Depth 45 m and a diameter of 1,000 m
- Volume about 23 million m³ sediments
- Construction finished in 2000
- Consortium of different companies constructed CDF and performed dredging
- Maintained by Dutch Ministry Public Works
IJsseloog
DWR Amsterdam

- Sediment Processing:
  1. Sand Separation
  2. Mechanical Dewatering (Belt Filter Presses)
- Between 1989 and 2005 Boskalis Dolman operated this regional processing facility;
- Dredged sediments originate from different smaller projects in the vicinity of Amsterdam;
- Dredged sediments where transported to this central processing location
- Per year about 50,000 m³ of sediment was processed and dewatered;
DWR Amsterdam
Slufter (Maasvlakte)

- Large Confined Disposal Facility (CDF)
- Constructed in 1985
- Surface of about 260 hectare
- Focus area: Contaminated sediments from harbor of Rotterdam
- Source of contamination are the industrials zones along the River Rijn
- Estimated capacity until 2025
- Maintained by Rotterdam Port Authority
Slufter (Maasvlakte)
Recent Projects in the United States

**Miami River Maintenance Dredging, FL (USA)**

In the period 2004 – 2008 a total of 550,000 m³ sediments from the Miami River where treated. About 34% sand was separated and beneficial used. Goal of the project was volume reduction by beneficial use and dewatering.

**Fox River Cleanup OU 2-5, WI (USA)**

A large scale sand separation & dewatering plant is designed & constructed on this project. Membrane Plate & Frame presses are used for dewatering. A total of 3.5 million CY of sediments will be treated in a period of 8 years staring May 1st 2009.
Miami River Project

- Total volume: 700,000 CY;
- River divided into 15 sections;
- Sensitive environment (manatee’s and Biscayne Bay)
- Phase 1: June 05 – December 05
- Phase 2: February 08 – November 08
- Target is volume reduction by
  1. Beneficial re-use
  2. Mechanical dewatering
- Capacity 2,000 CY / day
Miami River Project

Dredging
Survey
Marine Transport
Operations Management

Sediment Processing
Sediment Dewatering
Water Discharge

Land-based logistics
Environmental Monitoring
Project Management

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BOSKALIS DOLMAN

WESTON SOLUTIONS
Miami River Project
Miami River Project
Miami River Project
Fox River Cleanup

- Total river 39 miles long, OU 2 – 5 is about 13 miles
- Project area between “Little Rapids Dam” and “Green Bay” in Wisconsin
- Combined Remedy:
  1. Prospective dredge volume ~4,0 MM cy
  2. Prospective capping area > 500 acres
- Estimated remedial action duration = 8 years
- Monitored natural recovery in OU 2 and OU 5
- Fox River Cleanup Group:
  1. Tetra Tech (Main Contractor)
  2. J.F. Brennan (Marine Contractor)
  3. Stuyvesant E.CO (Processing Contractor)
Fox River Cleanup

- Debris Removal
- Dredging
- Capping & Sand Cover
- Sediment Separation
- Mechanical Dewatering with Membrane Presses
- Water Treatment
- Beneficial re-use & upland disposal
- Monitored Natural Attenuation
Fox River Cleanup

- One 12” hydraulic dredge
- Two 8” hydraulic dredges
- Max 10 miles of pipeline
Fox River Cleanup
Fox River Cleanup
Fox River Cleanup
## Miami River versus Fox River

<table>
<thead>
<tr>
<th></th>
<th>Miami River</th>
<th>Fox River</th>
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<tbody>
<tr>
<td><strong>Purpose:</strong></td>
<td>Maintenance</td>
<td>Cleanup</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>550,000 m³</td>
<td>3,000,000 m³</td>
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<tr>
<td><strong>Duration</strong></td>
<td>~ 1 year</td>
<td>8 years</td>
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<tr>
<td><strong>Dredging</strong></td>
<td>Mechanical Dredging</td>
<td>Hydraulic Dredging</td>
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<td><strong>Processing</strong></td>
<td>Mobile Plant</td>
<td>Fixed Plant</td>
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<tr>
<td><strong>Dewatering</strong></td>
<td>Belt Filter Press</td>
<td>Membrane Filter Press</td>
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Volume reduction through fraction separation for beneficial use and (mechanical) dewatering of the contaminated fine fraction.
Comparable Projects:

1. META in Hamburg (Germany)
2. AMORAS in Antwerp (Belgium)
3. Hudson River Cleanup in New York (USA)