

# Large Scale Sediment Management



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## Introduction

### The Netherlands:

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

### Northern America:

1. Miami River Project
2. Fox River Cleanup





# Organization

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



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# Core Business

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)



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# IJsseloog

- Estuary of River IJssel
- Branch of River Rijn
- Start in Graubünden (Switzerland)
- Total length 1.320 km (IJssel ~125 km)
- Watershed 185.000 m<sup>2</sup>
- Heavy industrialized areas



# IJsselooog

- 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 m<sup>3</sup> sediments
- Construction finished in 2000
- Consortium of different companies constructed CDF en performed dredging
- Maintained by Dutch Ministry Public Works





# IJsseloog



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# 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 m<sup>3</sup> of sediment was processed and dewatered;



# DWR Amsterdam



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# 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 industrial zones along the River Rijn
- Estimated capacity until 2025
- Maintained by Rotterdam Port Authority



# Slufter (Maasvlakte)



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# Logistics



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# Recent Projects in the United States

## Miami River Maintenance Dredging, FL (USA)

In the period 2004 – 2008 a total of 550.000 m<sup>3</sup> sediments from the Miami River were treated. About 34% sand was separated and beneficially 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 starting 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**

**BEAN ENVIRONMENTAL**



**Sediment Processing**  
**Sediment Dewatering**  
**Water Discharge**

**BOSKALIS DOLMAN**



**Land-based logistics**  
**Environmental Monitoring**  
**Project Management**

**WESTON SOLUTIONS**



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# Miami River Project



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# Miami River Project

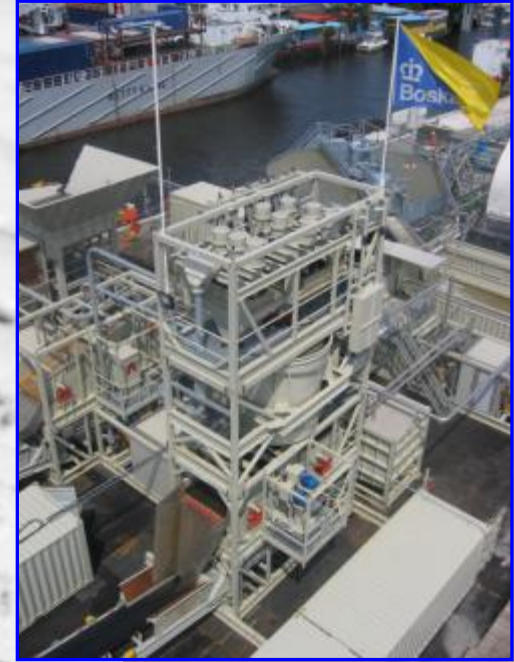


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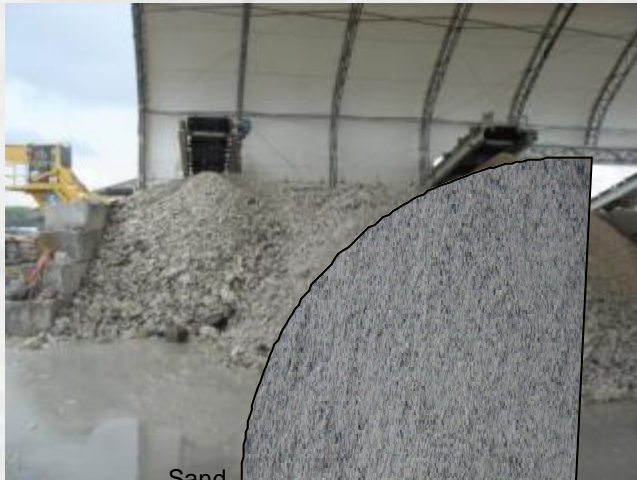
# Miami River Project



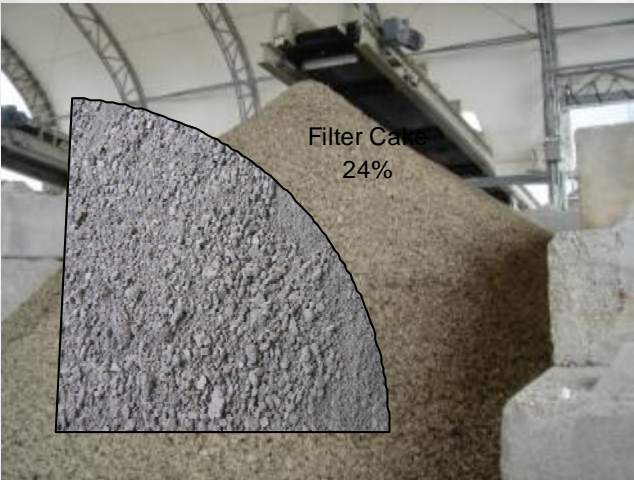
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# Miami River Project



Sand  
52%



Filter Cake  
24%



Coarse  
19%

Fine  
5%



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# 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 Group



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# 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



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# Fox River Cleanup



**One 12" hydraulic dredge**

**Two 8" hydraulic dredges**

**Max 10 miles of pipeline**



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# Fox River Cleanup



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# Miami River versus Fox River

	Miami River	Fox River
Purpose:	Maintenance	Cleanup
Volume	550.000 m3	3.000.000 m3
Duration	~ 1 year	8 years
Dredging	Mechanical Dredging	Hydraulic Dredging
Processing	Mobile Plant	Fixed Plant
Dewatering	Belt Filter Press	Membrane Filter Press

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)





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