

## Case Study Beneficial Use of Sediments

<b>Project</b>	<i>Sandvika Marina Harbour</i>
Classification	<i>R3B_2010_NO</i>
Major Function	<i>Reclamation</i>
Other Functions	<i>Raw material, Remediation</i>
Location	<i>Oslo, Norway</i>
Volume	<i>4,000 m<sup>3</sup></i>
Technique	<i>Mass stabilisation of contaminated sediments with hydraulic binders</i>
Contaminants	<i>Tri-butyl tin, As, Ni, Cu, Hg, Pb, Cr, Zn, Cd, PAH</i>
Granulometry	<i>Silty clay</i>
Scale	<i>Full scale</i>
Client	<i>Sandvika Municipality, Oslo, Norway</i>
Executor	<i>Contractor: Ramboll</i>
Research program	<i>N/A</i>
Contact	<i>Norwegian Institute for Water Research, NIVA.</i>
Year start - end	<i>2010</i>
<b>Description of the project</b>	
<p>Contaminated sediment from the Sandvika River seabed in the Oslo fjord was removed by dredging and stabilized by mixing with a GGBS plus cement-based binder and used in the construction of a new quay wall. Approximately 4,000 m<sup>3</sup> of sediments were dredged by a mobile crane and grab, and placed behind a concrete sheet pile wall, where mass stabilisation was carried out by injecting and mixing the GGBS/cement binder with the dredged sediments.</p> <p>The stabilised sediments were used for construction of a new quay wall, providing an additional 3,000 m<sup>2</sup> of new amenity land. The binder was a 50:50 mix of GGBS and cement, mixed at a binder content of 140 – 180 kg/m<sup>3</sup> of dredged sediment. The contaminants in the sediment comprised TBT, PAH, mercury and other heavy metals. Compressive strength tests on the stabilised sediments gave strengths in the order of 600 – 1,000 kPa at 260 days.</p> <p>A follow up laboratory study on the potential impact of the stabilised sediments on leaching of contaminants concluded that this beneficial use of dredged sediments generally reduces the leaching of heavy metals due to (a) the reduced exposed surface area of contaminated sediments, and (b) immobilization effects of the binders used in the stabilisation.</p>	

## Graphical information



Figure 1. Mass stabilisation of dredged contaminated sediment behind concrete quay wall



Figure 2. Completed project – stabilized sediments form new quay wall and walkway

## References/web links

1. *Miljøeffekter av stabilisering og solidifisering (STSO) av forurensede sedimenter i utløpet av Sandvikselva. Norsk Institutt for Vannforskning (NIVA) Rapport L.NR. 5972-2010.*
2. *(Environmental Effects of Stabilization and Solidification (STSO) of Contaminated sediments in the outlet of Sandvikselva. Norwegian Institute of Water Research (NIVA) Report No. L.NR. 5972-2010).*
3. [https://brage.bibsys.no/xmlui/bitstream/handle/11250/214966/5972-2010\\_200dpi.pdf?sequence=1](https://brage.bibsys.no/xmlui/bitstream/handle/11250/214966/5972-2010_200dpi.pdf?sequence=1)