

Case Study Beneficial Use of Sediments

Project	<i>METHA-Plant - Large Scale Sediment Treatment</i>
Classification	<i>R1A_1993_DE</i>
Major Function	<i>Raw Material</i>
Other Function	<i>Reclamation</i>
Location	<i>Hamburg, Germany</i>
Volume	<i>Up to 900,000 (m³/year)</i>
Technique	<i>Treatment of silty / sandy sediment for further beneficial use options</i>
Contaminants	<i>Main contaminants present</i>
Granulometry	<i>Silty/sandy/clayey</i>
Scale	<i>Full project scale</i>
Client	<i>Hamburg Port Authority</i>
Executor	<i>Hamburg Port Authority</i>
Research program	<i>N/A</i>
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Status	<i>Commercial</i>
Year start – end	<i>1993 – ongoing</i>

Description of the project

The METHA-Plant is a key technology of the Hamburg Dredged Material Management concept which includes in total different technologies for treatment, beneficial use, and disposal of dredged material while, at the same time, taking care of the environment. The METHA-Plant provides a capacity for the treatment of up to 0.9 Million m³ sediment annually to secure the operational capability of the Port of Hamburg.

METHA (Mechanical Treatment of Harbour-Sediment) started operating more than 20 years ago in March 1993. Due to the ongoing examination and adjustment of the treatment technology during the last 20 years even today the METHA-Plant represents the state-of-the-art.

For reliable handling, the METHA technique is based on a two-step separation. In the first separation 63 µm silt (with adhering harmful substances) is separated so far as possible from the sand using hydrocyclones and upstream current classifiers. The 20 µm separation stage is an optional process step and is activated when the grain size distribution is predominant in the range of 20 – 100 µm. The second separation step at 20 µm uses hydrocyclones and downstream spiral concentrators.

The products of the separation stages, sand, fine sand and silt are dewatered by an aligned technology for each type. The sand fraction is dewatered on dewatering sieves and the fine sand fraction is dewatered using a vacuum belt. The dewatering of the flocculated silt suspension is carried out in two stages with the application of a filter belt press and a high-pressure press or alternative with membrane-chamber filter presses.

In many cases and especially for large volumes from regular maintenance dredging, an option like the METHA-treatment is essential to guaranty a good product quality for further beneficial use options.

Graphical information

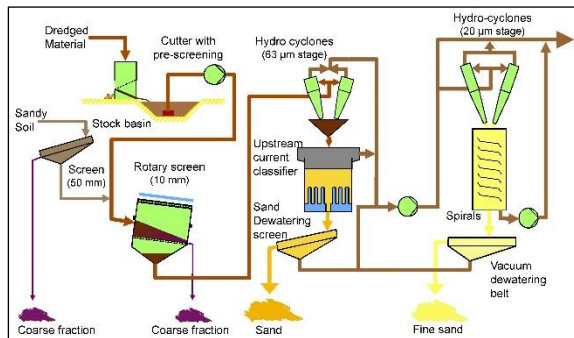


Figure 1: METHA – Sand Silt Separation

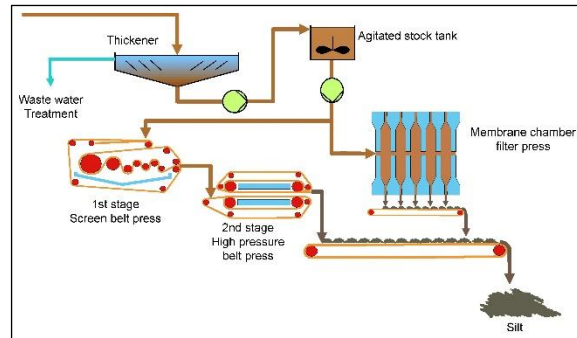


Figure 2: METHA – Dewatering Fine Fraction



Figure 3: Aerial photograph of METHA-Plant Hamburg

References/web links

1. Detzner, H.-D., Kitschen, L. and Weimerskirch, W. (1993). METHA - the first large-scale plant for treatment of harbour sediments. *Aufbereitungstechnik / Mineral Processing*, Vol. 34, No. 5, pp. 235-242
2. Detzner, H.-D. (1995). The Hamburg project METHA, large-scale separation, dewatering and reuse of polluted sediments. *European Water Pollution Control*, Vol. 5, No. 5, pp. 38-42
3. Detzner, H.-D., and Knies, R. (2004). Treatment and beneficial use of dredged sediments from Port of Hamburg. *World Dredging Congress XVII, Hamburg, Germany. B2-1*, pp. 1-14
4. Detzner, H.-D. (2013). 20 years of large scale sediment treatment at the METHA-Plant. *World Dredging Congress XX, Brussels, Belgium. Session 6 – Treatment of sediment / 1*
5. <http://sednet.org/download/H-Detzner.pdf>