

VAMORAS

Valorization of mechanically dewatered dredged sediments

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Introduction: In the Port of Antwerp, 500.000 tonnes DM of sediments need to be dredged each year to ensure the navigability of the waterways. Traditionally, these maintenance dredged sediments were disposed in settling ponds or underwater cells. However, due to near exhaustion of the existing storage capacity as well as limited availability of new storage sites, an alternative, sustainable solution needed to be developed. Between 2008 and 2011, the spectacular treatment and storage facility AMORAS was realised by the Flemish Government. Since 2011, the AMORAS-installation treats up to 600.000 ton DM of sediments by mechanical dewatering using the most modern technologies. The produced filter cakes have a dry matter content of minimally 60%, resulting in a significant volume decrease of the sediments as well as physical properties allowing storage in an onsite landfill. To further increase the sustainability of the process and lengthen the lifetime of the landfill, valorization of the filter cakes as secondary raw materials is investigated. Potential reuse of the filter cakes was already considered during the design of the installation. To optimize the possibilities for reuse, a strict separation between highly and marginally contaminated sediments is maintained throughout the process. Furthermore, the sediments are homogenized in different steps, resulting in a continuous supply of homogeneous sediments with a good environmental quality. As such, the filter cakes of AMORAS are uniquely suited for valorization.

Already since the start of the AMORAS project, the Flemish Government, represented by the Department for Mobility and Public Works (MOW), division Maritime Access, in collaboration with the Port of Antwerp, is also considering the re-use of the non-contaminated filter cakes for beneficial purposes and subsequently increasing the operational lifetime of the storage facility.



The ongoing **VAMORAS**-project investigates the possibilities to use the filter cakes as a clay replacement in ceramic products (expanded clay aggregates, bricks), as filler in concrete or directly as road foundations. This development project, which started in 2011 and will finish in September 2013, is performed in collaboration between 2 authorities (Department of Maritime Access of the Flemish Government, as project leader, and Port of Antwerp, as project coordinator), 3 research institutes (VITO, WTCB, OCW) and 3 industrial partners (Argex, Wienerberger, De Rycke).

The goal of the project is to come to a factual reuse of the sediments in one or more of the different researched applications.

Methods: A first stage of the project consisted of laboratory scale investigations to determine the characteristics of the sediments and their suitability for the different applications in view of technical and environmental requirements. Potential problems were identified and tests were performed to optimize the characteristics of the filter cakes for the applications. Additionally, the homogeneity of the sediments and the resulting filter cakes was assessed.

In a next step, industrial trial productions were performed, with evaluation of the technical and environmental quality of the products as well as an assessment of the environmental impact during the production process. Finally, field trials will be executed to demonstrate the applicability, and a market evaluation will be performed.

Results: The results confirm the high degree of homogeneity of the filter cakes. Preliminary results of the industrial trials show that reuse of the filter cakes in the different applications is possible. However, the amount of filter cakes that can be applied is limited by application-specific technical and environmental constraints.