



**DEME**

Dredging, Environmental  
& Marine Engineering

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## PRESS RELEASE

28/08/2008

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### **Important environmental design, build and operate contract 'AMORAS' for the port of Antwerp awarded to the joint venture SeReAnt (Dredging International, DEC, Jan De Nul, Envisan,)**

*Today an important assignment for the design, construction and exploitation of a silt treatment and storage system in the port of Antwerp - the AMORAS project - has been awarded to Dredging International and Jan De Nul, supported by their respective environmental subsidiaries DEC (DEME Environmental Contractors) and Envisan. This group of specialised contractors has joined forces within the joint venture company SeReAnt. The contract calls for a design and construction period of 30 months, followed by the exploitation of the installations for a period of 15 years. The entire operation represents a total turnover of 400 million Euro, excl. VAT.*

Guaranteeing sufficient draught to shipping traffic is an essential condition for the Port of Antwerp to prosper now and in the future. In order to do so, the Antwerp Port Authorities need to dredge and store large volumes of siltation material on annual basis. However, the available deposit areas for dredged spoil are insufficient. The Flemish Government, therefore, has decided to build a mechanical silt dewatering plant in the port area as a lasting and innovative solution for the treatment and storage of dredged spoil. This ambitious project has been given the name AMORAS.

The acronym A.M.O.R.A.S. stands for "Antwerpse Mechanische Ontwatering, Recyclage en Applicatie van Slib" (Antwerp Mechanical Dewatering, Recycling and Application of Silt). The project shall provide a permanent solution for recycling and storage of dredged sediments in the port of Antwerp.

AMORAS will be implemented in two phases. Phase 1 will cover detailed engineering and construction of the dewatering plant and will be executed in a period of 30 months. In phase 2 the actual exploitation of the plant will start for a period of 15 years. Calculated in 'dry material' some 500,000 tonnes will have to be treated and storage on annual basis.

The partners taking part in the SeReAnt joint venture company have extensive and specialised experience with all distinctive aspects of the AMORAS project, such as the exploitation of various silt treatment centres, dredging and transport of dredged spoil, desanding and mechanical dewatering including storage of dredged spoil. Moreover, these companies can count upon a substantial in-house diversified environmental expertise. In terms of sustainability the proposed silt dewatering installation meets all contemporary ecological demands, pursuing maximum efficiency of used energy in every phase of the process applied.

Moreover, the plant has a reliable and user-friendly design as a result of far-reaching automation, in-depth control systems and optimal use of available capacity, allowing SeReAnt to guarantee a very long life cycle for the AMORAS project.

For the DEME Group the award of this contract has a high strategic value, since it confirms the pioneering and innovative status of DEME's environmental specialists on European level. It constitutes the fifth long-term contract for environmental treatment and remediation on European level, obtained by DEC in only a couple of years. The other contracts cover the remediation of acid tar basins for Total in Ertvelde (Belgium), the construction and exploitation of a recycling installation for Nyrstar in Balen (Belgium), the remediation of Chesterfield Coke Avenue brownfield (UK) and the decontamination of the London Olympics 2012 site (UK).

The attached drawing shows the seven important steps in the AMORAS project :

1. The underwater cell : the maintenance dredging material from the harbour docks is stocked temporarily by the Antwerp Port Authority in an underwater cell (capacity 150,000 m<sup>3</sup>) to be created in the Canal Dock B1. A dredging unit pumps the dredged spoil to the shore for the treatment process to start. More or less heavily contaminated spoil is not stocked temporarily but pumped ashore directly using a barge unloading dredger.
  2. Sand separation : The material pumped ashore is diverted to a sieving installation to remove all coarse elements. Depending on the environmental quality of the material and/or the detected sand fraction percentage, the decision is taken to de-sand the material in a sand separation plant.
  3. Discharge line : Next, the material is pumped through a discharge pipeline to the treatment plant on the Bietenveld, 4 kms away.
  4. Consolidation ponds : On the Bietenveld site the material is deposited temporarily in 4 consolidation ponds, having a capacity of 120,000 m<sup>3</sup> each. In the consolidation ponds, the process water required for sieving, de-sanding and pumping of the material is separated again. Less contaminated spoil is deposited in three consolidation ponds, whereas more contaminated material goes to the fourth pond.
- An innovative dredging system with rotating gantry spanning the consolidation ponds allows fully automated steering of the process. The dredging gantry is equipped with two mobile dredge pumps that can move along the entire span and that are able to work independently from each other.
5. Dewatering plant using filter presses : In the dewatering hall the consolidated spoil is conditioned and dewatered to form a residue of filter cakes. A number of membrane chamber filter presses dewater the material, pressing the water through a filter cloth.
  6. Water purification plant : The filter process water and other effluent water is gathered in the buffer pond for waste water and subsequently pumped to a water purification plant. There the particles in suspension are removed through a physico-chemical process. In a second step the organic material and nitrogen is removed by means of biological cleaning.
  7. Deposit site : The controlled deposit of the filter cakes is located on the site "Zandwinningsput", situated between Hooge Maey, Indaver and the A12 motorway. On this site a stack of filter cakes, over 50 m high, can be deposited on top of an existing 10 m layer of medium consolidated silt that has been deposited there earlier.

*About Dredging International :*

*Dredging International is one of the operating companies of Belgium-based DEME-Group, a world leader in dredging, hydraulic engineering and environmental projects. Staff and crew at DEME amount to 3.500, working on the five continents. In 2007 DEME realised a turnover of 1,31 billion Euro and an operational cash-flow (EBITDA) of 259,4 million Euro. With 80 major dredges and some 200 auxiliary vessels, the group operates one of the most modern, performing and versatile fleets in the world.*

*Since 7th January 2008, DEME presents itself to the outside world under a new logo and a new look. The logo and the look underline the independence of every single operating company, yet at the same time their belonging to one bigger whole. As a group of specialised companies, DEME has the capability to offer and execute global solutions for its clients. The new tagline 'Creating Land for the Future' stresses the orientation towards the future and the sustainable way of doing business at DEME.*

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