INDUSTRIAL FABRICS

Case study TenCate Geotube®

TENCATE Geotube®

Remediation of the mercury-contaminated sediments in Svartsjöarna

THE CHALLENGE

Svartsjöarna in Sweden are located near Pauliström. Through the lake, a small river runs into the river Emån. This Emån river is considered to be one of the most valuable water courses in Sweden. The river has a very high diversity of fish species and animal like otter. Some parts of the river have very well developed meander systems. For these reasons, a remediation had to be carried out very carefully. Industrial sites have been located along the river since the 1700's, affecting the water quality. Svartsjöarna have for a long time served as sedimentation basin for pulp fibres coming from the Pauliström paper mill, 3 km upstream of the lake. In the mid-60's, a mercury based product was used for protecting the pulp from bacteria.
The contaminated sediments consist of cellulose fibres polluted with mercury. It was estimated that the total fibre discharge from the mill amounts to between 15 and 20.000 tons.

THE SOLUTION

A joint venture of DEME Environmental Contractors (DEC) and Dredging International was rewarded this design and construct contract. DEC-DI is a Belgian consortium with long standing international experience from similar environmental projects.
The remediation works in Svartsjöarna involve dredging of approx 260.000 m^3 of mercury contaminated fibre sediments. These sediments were pumped to the landfill nearby, specially prepared for this project where it was treated with polymers (flocculants) and pumped into TenCate Geotube®. It was the first time that this new technology was used in Sweden and the largest project in Europe with TenCate Geotube® till then.

THE PRODUCT

TenCate Geotube® is a structure, made from filterweave from TenCate, with small pores, resulting in effective dewatering of sediments. The dimensions of TenCate Geotube® for the project are approx 50 meters long with a circumference of 18,3 meters. In order to reduce the landfill surface, TenCate Geotube® are be stacked up to three layers high. Dewatering of the sediments takes place in the basin. After several times of filling and dewatering of TenCate Geotube® the consolidation of the sediments reaches its final stage.
The wastewater coming from the dewatering process was treated and controlled before it streamed back into the lake. After the final consolidation of the three layers, the landfill was covered with soils and closed in 2007 after final inspection.

Following time schedule applies for the remediation works:

- Preparation of the site June - November 2005
- Dredging of the sediments April – December 2006
- Final landfill works September – November 2007
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Final inspection of the remediation works is carried out after final landfill works.

Since the overall goal for the remediation project was to reduce the mercury-load to a level where risk for negative effects on water-organisms would be small and mercury-levels in due time would be reduced in fish from the Svartsjöarna lakes, an intermediate basin collected the effluent water running from the tubes. Here it was checked for impurities. When the quality was good the effluent was polished before being released, cleaner than ever into the lake it originated from. Part of the water was re-used to dilute the sludge inline to get a better pumping result and a more even dry solid distribution. The reduction of the oxygen-demand due to evacuation of the layers of accumulated wood fibres and other organic material created the conditions necessary for a more natural environment.

Besides the excellent fine filtering performance of the TenCate Geotube® fabric, the containment of the heavily contaminated sediments should be flawless. On the landfill area created for this purpose over 250 TenCate Geotube® containers of approximately 50 meters long and over 9 meters wide had to be laid out. Due to the strength of the fabric and the special way TenCate uses to construct the TenCate Geotube® containers they can be stacked. This keeps the footprint of the area small and reduces the cost. On the same time it improves the dewatering result in the lower tubes. Today TenCate has experience with stacking more than seven layers one on top of the other. In Sweden three layers proved to be sufficient. After the final consolidation of these layers, the landfill was covered and closed after final inspection of the remediation works.

FOR MORE INFORMATION, PLEASE CONTACT OUR SALES OFFICE

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