WATER-POWERED DRILLING IN THE SWEDISH VOJMSJÖN
DAM REHABILITATION PROJECT
The Vojmsjön reservoir dam receives large amount of melt water from the surrounding mountains. At peak flow, the dam is filled in less than a week. Wassaras water-powered DTH hammer W200 is used for the drilling when installing the steel pile wall that will seal off the leakage. In order to minimize the risk of pressurizing the formation, the choice of drilling method is a key factor. Therefore, the water-powered technology was prescribed by the consultants Geomind and Sweco. The water-powered system was used in temperatures down to -20° C.

DESIGNED TO HANDLE EXTREME FLOWS

The Vojmsjön reservoir earth embankment dam is located in Lapland, Sweden. It was built in 1947-50 and has an area of 63-86 km². It serves as a reservoir for control of the water flow of melt water from the surrounding mountains. Filling it up in spring/summer and releasing the water in autumn, the dam serves the hydropower stations down the Ångermanälven river in running them optimally.

At peak flow, the dam is filled in less than a week. Due to excess leakage through the dam, it is classified as a high risk dam by the authorities. When completed, the sealing of the dam is calculated to withstand the extreme flows that are calculated to occur only once in 10 000 years.

REHABILITATION PLAN

The contractor Lemminkäinen was awarded the contract for the dam rehabilitation project. The dam is sealed off along the 335 m long embankment. A 170 m long drilled steel pile wall (totally 1 680 m²) is being installed with an interlock system. The piles are attached to each other by interlocking sections, assuring the wall to be water-tight. The largest drill depth is 13.5 meter.

WATER-POWERED DRILLING; OPTIMAL AND PRESCRIBED

The consultants Geomind and Sweco planned the drilling operation, Geomind was also project evaluating partner. In order to minimize the risk of pressurizing the formation, the choice of drilling method is a key factor. The water-powered technology was prescribed as follows:

– “In order to minimize any disturbance of the dam core, installation (of the piles) shall be done with a water-powered DTH hammer”. Wassara is the inventor and world leading producer of the water-powered technology.

TIGHT TIMEFRAME

As the spring flood can be severe in Lapland, the timeframe for the dam rehabilitation project was quite tight. The total time slot was only two months. After this, the water would reach the set limit.
WATER SUPPLY

The required amount of water was collected from the lake. A dewatering pump on a barge secured the supply.

A PLEASED CONTRACTOR

Per-Åke Hörnfeldt, Project Manager at the contractor Lemminkäinen, is pleased with the water-powered drilling.

– “Thanks to the water-powered DTH hammer W200 from Wassara, we could utilize the RD piles with the interlocking system. This gives a very good sealing of the dam. We were able to use the water-powered system even when we met big boulders in the formation and in temperatures down to -20° C.”

PROJECT TIME

March 4 – end of May 2013
WASSARA – COST-EFFICIENT AND ENVIRONMENTALLY FRIENDLY DRILLING

LKAB Wassara is a Swedish company developing and manufacturing unique water-powered drilling systems for high performance in surface- as well as underground drilling operations. The heart of the Wassara drilling system is the world patented water-powered down-the-hole hammer.

The drilling systems have been used for more than 20 years in various applications within many industries; mining, exploration, ground engineering, dams, geothermal, marine, oil & gas storage. Our experience covers more than 25 million drilled metres working in different locations around the world. Reference studies can be found on our website.

LKAB Wassara was founded in 1988 and is owned by LKAB. LKAB is an international high-tech minerals group that produces iron ore products for the steel industry and other mineral products for many other industries and applications.

Explore more at www.wassara.com