WATER AND SEWAGE

NOWRA - REMS 1B

Hydraulic cut-off wall (Slurry wall)

AUSTRALIA

Backfilling operation followed by forming bunds on the top of the slurry wall

Owner
Shoalhaven City Council (Shoalhaven Water Group)

Engineer
GHD

General contractor
UGL Limited

Period of works
December 2016-February 2017

Main figures

Slurry trench
8546.3 square meters (1333 linear meters multiplied by average trench depth)

30-tonne excavator during trenching operation

Mixing of virgin soil with bentonite fluid

Project description

Reclaimed Water Management Scheme (REMS 1B) is a project undertaken by Shoalhaven City Council which aims to upgrade treatment and distribution process of used and recycled water from Nowra and Bomaderry Wastewater Treatment Plants to users from the region. One of elements of this project is construction of equalisation tanks.
The main interest of a hydraulic cut-off structure was to mitigate risks of damage to the tanks in case of a rapid groundwater table rise following a storm or flood event.

Ground conditions

Existing soil layers comprise clayey sand overlying loose sand and firm to very stiff clay. The clay layer was chosen as aquitard in which the hydraulic cut-off wall was to be socketed. The clay was found at different depths, between 5.0 and 6.9 metres below natural ground level.

Solution

Slurry wall was chosen as the best option amongst other cut-off techniques, i.e. soil mixing and sheet pile walls. Slurry walls are easy to construct: conventional earthmoving equipment is sufficient. This technique is highly effective in blocking lateral seepage through aquifer layers and does not produce much spoil – most of the excavated material is re-used in-situ.
Slurry walls are installed as trench excavations whereby in-situ materials are removed and replaced by a relatively impermeable backfill material. The trench is excavated through a bentonite fluid over the depth designed for the barrier. The supporting fluid is then replaced in the backfilling operation. The wall was socketed in stiff – very stiff clay. The maximum height of the wall at Nowra was about 6.9 m and trenching was done by a 30-tonne excavator.

Sustainable development

Slurry wall technology is environment-friendly and produces very little spoil.