

PORT BONYTHON

CEMENT BENTONITE BARRIER WALL



Client: Santos Pty Ltd
Consultant: URS

Principal Contractor: Menard Bachy Pty Ltd

THE PROJECT

The Santos Port Bonython Hydrocarbon Fractionation Plant is located on Weeroona Bay, approximately 35km from Whyalla in the Northern Spencer Gulf.

Soil and groundwater beneath the site appeared to be primarily impacted by crude oil leaking from adjacent storage tanks. The groundwater impacts were in the form of light non-aqueous phase liquids (LNAPL) typically floating on the groundwater or locked up in the formation and dissolved phase hydrocarbons in the groundwater

The presence of both off-site impacts and the potential for discharge to the marine environment necessitated a rapid evaluation of long-term mitigation and remediation options. In a collaborative evaluation of options a cement bentonite barrier wall was selected by Santos as the preferred remedial alternative, as it provides the highest level of confidence that off-site migration would be controlled and the long-term impacts mitigated.

MENARD BACHY'S ROLE

Menard Bachy Pty Ltd was engaged by Santos Ltd to undertake construction of the perimeter barrier (cut off wall) at the Santos Port Bonython site. The barrier wall is aligned adjacent to and sub-parallel to the ocean shoreline over a length of about 450m and is required to extend to a typical depth of 6-7 m below initial surface level.

The scope of works included the pre-excitation along the wall alignment through extremely high strength, abrasive sandstone, progressive backfilling and re-excitation under cement bentonite slurry, installation of a capping beam spanning the trench, the tracking and burial of contaminated spoil and finally reinstating the site to natural contour levels.

As this was a highly sensitive project, the site was stringently overlooked by the Environmental protection authority and independent verifiers. A strict quality and testing schedule was adopted and implemented throughout the project ensuring the design intent.

After the initial rock breaking excavation, the wall was re-excavated under the cement bentonite slurry in panels which replaced the excavated material with the final cement bentonite mix to form the low permeability barrier. The mix design adopted produced a final wall with a permeability in the order of 5×10^{-9} m/sec and unconfined compressive strength of approximately 80kPa.

In total Menard Bachy mobilised 14N^o 30t excavators and hammers to remove 5000m³ of overburden material and extremely high strength rock within 15 days and batched and placed approximately 800t of cement powder in 1t bags with 300t of hydrated bentonite within a 3 week period.