

CASE STUDY: The History of Water Supply on the Central Coast

APPENDIX 10: Construction of the Stage 1 dam (see page 19).

Statistics of the completed Mangrove Creek dam

Dam Structure

The completed dam has an 80 metre high wall with a crest length of 380 metres, a spillway 300 metres in length and a 50 metres high intake tower.

Scope of the Dam

The dam has a catchment area of 100,000 hectares. Its storage capacity is 170,000 million litres, or approximately 30% of the capacity of Sydney Harbour. The stored waters will have a surface area of 700 hectares.

Composition of the Dam

Rolled, soft rockfill, using 1.2 million cubic metres of the Narrabeen group of sandstones and siltstones.

The embankment also contains 100,000 cubic metres of processed basalt.

Upstream Face

The upstream side of the dam has a concrete face tapering from 0.6 metres at the base to 0.3 metres thick at the crest. It contains 20,000 cubic metres of concrete and covers an area of 30,000 square metres.

(Programme for the Official Opening Ceremony, Mangrove Creek Dam, 19th July 1982)

Difficulties during construction

The implementation of any major public work is a continuous problem-solving exercise in which the original design features and targets have to be continuously adjusted to meet the realities of what unfolds in the field.

Preliminary work on the dam including construction of access roads began in early 1977. Initial clearing of vegetation, construction of diversion tunnels, overburden removal and toe-slab construction proceeded more or less on schedule aiming for a completion date in mid 1981. However, in October 1979, soon after the Citra Construction contract commenced, significant problems arose in the foundation surface on which the embankment was to be constructed, due to 'valley heave in the creek bed' and "valley bulging" :

"The siltstone layers exposed, showed an upward bulge (anticline) of some 2 metres from the edges of cliffs bounding the creek bed to the approximate centre of the creek (i.e. over a distance of some 40 metres)." (page 13-2)

This unwelcome development required a major alteration in the contract specifications in order to ensure a stable foundation for the embankment. As a result, the construction time was expanded (as was the cost) and the actual completion date for the dam was extended from May 1981 to 7th June 1982.

(*"The Construction of Mangrove Creek Dam Stage1- Gosford-Wyong water Supply"* Volume 1, NSW Department of Public Works, 1982)

