

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

9. The Mangrove Creek Dam – weighing up the alternatives

In considering how the decision was arrived at to build a dam on the Upper Mangrove Creek catchment, it is important to realise the following:

Some factors in the Mangrove Creek Dam decision.

1. The construction of a dam on upper Mangrove Creek was common to Schemes 1,2,5,6, 9 and 10 but not Schemes 3, 4, 7 and 8 listed in Table 2.
2. Mangrove Creek Dam was proposed as a large **storage** dam not primarily a collection dam. Its catchment area (101 square kilometres) was relatively small but the shape of the valley and its geology enabled the construction of an 80 metre high wall that would store 181 million cubic metres of water (Stage 1). At a later date, the height could be increased, if required, by another 25 metres, increasing its total capacity to 455 million cubic metres (Stage 2).
3. The main source of water to fill the dam would come from the Wyong River catchment. Additional water would also be required from at least one external source i.e. outside these Gosford and Wyong catchments. To quote from the report (p 29 Volume 1):
“In order to meet the assessed annual demand for the region.... of 111.2×10^6 cubic metres per annum and considering the average streamflows from 1904-1973, it can be seen that it would be necessary to tap at least one of the major streams outside the Shires [or from renovation of wastewater (Scheme 9) or desalination (Scheme 10)]...”
4. **All** potential schemes required additional preliminary works such as a low weir on Ourimbah Creek with a pipeline to Mardi Dam, interconnection of Wamberal and Bateau Bay reservoirs, and increased pumping capacity at Wyong River and between lower Mangrove Creek Weir and the Somersby Water Treatment Plant. With the exception of Schemes 4, 7 and 8, there would be need of a transfer system (pressure tunnel and other infrastructure) on the Upper Wyong River in order to deliver water into storage in the Mangrove Creek Dam whenever flows exceeded demand. There would also need to be a Wyong-Gosford transfer system.
5. At the time of the report, Schemes 9 (renovation of wastewater) and 10 (desalination) were evaluated as too costly. According to the report (p. 83 Volume 1):
“The present costs associated with desalination are much greater than the costs of further development of surface water resources in the Gosford-Wyong region. The costs of water renovation to potable standards are also somewhat higher than utilizing further surface water sources and renovation also carries a considerable public health risk....However it is possible that technological progress over the next twenty years could make either process more practicable and as both possess considerable environmental advantages over surface water development it would be advantageous if the chosen scheme had sufficient flexibility to conveniently incorporate either desalination or renovation if required at a later date.”
It is to be noted that construction of a Mangrove Creek dam was considered to be an integral part of each of these two Schemes.

QUESTION:

Apart from the obvious criteria of streamflow, catchment area, construction feasibility and cost for a potential dam site, what other factors do you think need to be considered in deciding whether or not to go ahead with the construction of a dam in an identified location? List at least three distinct considerations not referred to in the above discussion.

