Extraction of Entrance Shoals Upstream and Downstream. Dry Earth Sand Winning with Beach Cut and Cover Pipeline

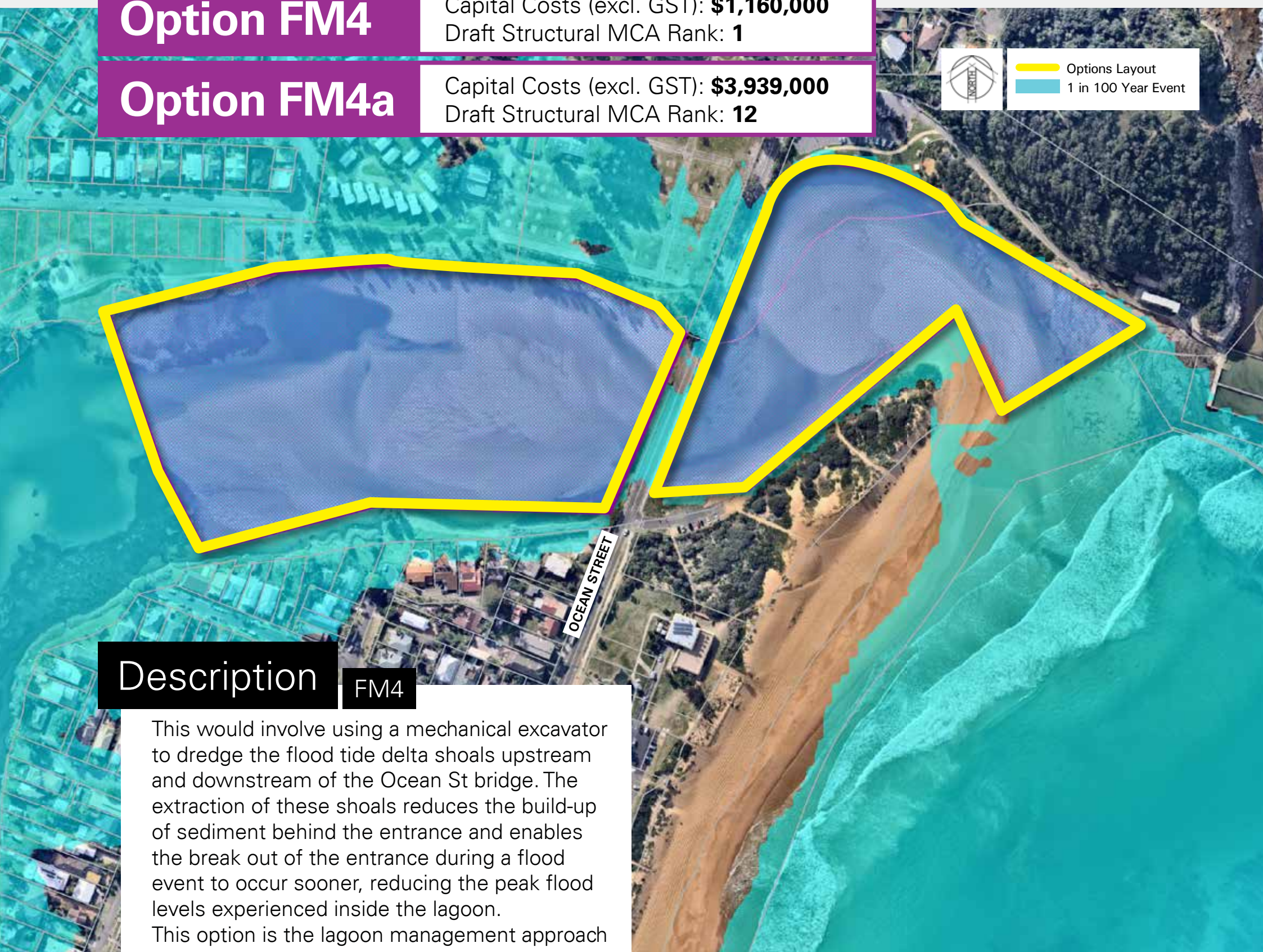
northern beaches council

Option FM4

Capital Costs (excl. GST): **$1,160,000**
Draft Structural MCA Rank: **1**

Option FM4a

Capital Costs (excl. GST): **$3,939,000**
Draft Structural MCA Rank: **12**



Description FM4

This would involve using a mechanical excavator to dredge the flood tide delta shoals upstream and downstream of the Ocean St bridge. The extraction of these shoals reduces the build-up of sediment behind the entrance and enables the break out of the entrance during a flood event to occur sooner, reducing the peak flood levels experienced inside the lagoon.
This option is the lagoon management approach that has been implemented for Narrabeen Lagoon since 1975, with clearance occurring on average every 4-5 years.

Description FM4a

This option entails utilising a mechanical excavator to remove the sand. This sand is then placed in a hopper and turned into a slurry through the addition of water before being pumped to beach replenishment locations. The potential benefit of this approach is that while a significant upfront infrastructure cost is required, this may be offset by efficiencies gained over future extraction projects and may significantly reduce the lead time for action compared to FM4 which requires new regulatory approvals each time.

Note modelling results of this assessment are consistent with option FM4

Modelling Results

The results of the simulations show that Option FM4 is effective in its aim to reduce flood levels. Compared to a fully shoaled entrance, Option FM4 reduces flood levels throughout the lagoon by around 0.4 – 0.5 m for the more frequent floods of 1 in 5 and 1 in 20 year events. The 1 in 100 year flood has reductions of between 0.36 – 0.46 m while the 1 in 1000 year has reductions in the lagoon of between 0.27 – 0.37 m. The effect is slightly more pronounced at the entrance than it is upstream around Deep Creek. This result indicates that the entrance shoals have a major impact on flooding, and that dredging of the shoals upstream and downstream of the Ocean St bridge is an effective flood mitigation option.