

Planning our water future

Central Coast Council is planning for our future now to ensure our region has a sustainable and resilient water system that can adapt and respond to change. We need to consider new sources of water (supply) and find new ways to reduce the water we all use (demand). This series of information sheets provide an overview of the potential water supply and demand option types we are discussing with our community as we plan our water future together.

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Supply option: Dams

What is it and how does it work?

A dam wall creates an artificial lake in which water can be stored. Stored water is then treated before being provided to the community through the water supply network.

A dam can be located 'on-river', where it fills directly from river flows, or 'off-river' where water is transferred to it from other sources, such as a nearby river or dam.

When a dam is located on a natural waterway, flows are released from the dam to protect the downstream environment. Water sharing plan rules are observed to leave water for other shareholders including the environment.

What is currently in place on the Central Coast?

Council has three dams:

- **Mangrove Creek Dam**
(maximum storage: 190 billion litres)
- **Mardi Dam**
(maximum storage: 7.4 billion litres)
- **Upper Mooney Dam**
(maximum storage: 4.6 billion litres)

These dams are filled from their natural catchments and from pumped flows from the Wyong River and Ourimbah Creek (Mardi Dam) and the Lower Mangrove Creek Weir (Upper Mooney Dam). Transfer schemes also move water between Mardi and Mangrove Creek Dam to better utilise the large storage available in Mangrove Creek Dam.

Things we need to consider

Dams provide an important store of water during drought. As storages deplete, they provide lead-time to plan and implement other drought response actions as needed, such as a desalination plant, to ensure communities do not run out of water during a severe drought.

Dams have long lead times for construction and have a relatively large upfront cost due to the scale of the infrastructure required. The ongoing costs to operate a dam once built are relatively low if the dam is located near the community receiving the supply. Dams are a climate dependent source of supply.

The environmental and social impacts of a dam are associated with the surrounding land that may be inundated and alteration of river flows downstream of the dam. The size of these impacts is related to the size of the dam and whether it is located on-river or off-river.

Dams can provide positive social outcomes by providing economic stimulus to an area during construction and through increased tourism dependant on the allowable uses in the vicinity of the dam.

How we're considering this option for the Central Coast Integrated Water Resource Plan

We have shortlisted and further investigated the dam options identified in the WaterPlan 2050 (2007) and earlier options identified by the NSW Public Works Department (2003).

Council is investigating dam enlargement options for the existing Mangrove Creek Dam by an additional 40 or 80 billion litres.

Council is also investigating an additional transfer scheme that would allow the transfer of water from the Lower Mangrove Creek Weir to Mangrove Creek Dam – which would effectively increase the catchment area of the existing dam.

The effectiveness of additional dam storage is being considered with and without additional transfer schemes, as well as the interaction with increased water sharing with Hunter Water (see Factsheet 7).

The construction of a new dam was one of the many shortlisted options that Council investigated. However a feasibility assessment identified that the construction of a new dam would face higher costs

and environmental challenges than the equivalent (or greater) capacity that can be provided by the option of raising Mangrove Creek Dam.

Mangrove Creek Dam enlargement options would involve raising the current dam wall so that it can hold back an additional 40 billion or 80 billion litres of water. This will enable Council to store more water to supply the growing population, and also inundate more land upstream of the dam. Changes to the water sharing rules between Council and Hunter Water would need to take place in order to maximise the benefits of the enlarged Mangrove Creek Dam.

Lower Mangrove Creek Weir transfer scheme is a potential expansion of the catchment area that can contribute to the volume of water stored in Mangrove Creek Dam. This would require the construction of a 19km long, 900mm diameter pipeline, to transfer water from an existing weir downstream of the dam. The option would also require upgrades to the existing water pump station located at the weir which is currently used to transfer water from the weir to Somersby Water Treatment Plant.





Mangrove Dam

Key results



The table below provides further detail about how this option is being considered in the plan.

	Category	Additional information
Potential additional water available	Medium	Has the capacity to store a large quantity of water. Are reliant on suitable catchments (size and average rainfall areas) to collect sufficient volumes of runoff.
Reliability and resilience	Medium	Increased storage improves the reliability and resilience of our system by storing more water during wet periods and utilising this water during periods of dry weather. Relies on rainfall and suitable water quality to fill the dams and does not ensure an ongoing supply in long and severe droughts. Stored water can be susceptible to water quality events e.g. blue-green algae. Not as readily adaptable to be staged or upgraded in future as some other options.



Mangrove Creek Dam enlargement by 40 gigalitres of storage




	Impact	Cost	Additional information
Indicative cost to build		\$80 million	Cost to construct new dams is typically very high. Enlargement of existing dams can potentially be more affordable.
Indicative cost to operate		\$700,000 per year	Relatively low cost to operate.

Mangrove Creek Dam enlargement by 80 gigalitres of storage

	Impact	Cost	Additional information
Indicative cost to build		\$160 million	Cost to construct new dams is typically very high. Enlargement of existing dams can potentially be more affordable.
Indicative cost to operate		Negligible additional to existing dam	Relatively low cost to operate.

Mangrove Creek Weir to Mangrove Creek Dam transfer

	Impact	Cost	Additional information
Indicative cost to build		\$110 million	Cost to construct new dams is typically very high. Enlargement of existing dams can potentially be more affordable.
Indicative cost to operate		\$3.6 million per year	Relatively low cost to operate.

	Impact	Additional information
Environmental impacts		Impacts on terrestrial and aquatic biodiversity. Low energy use and associated greenhouse gas emissions. Environmental and biodiversity offset costs likely to be required.
Cultural and social impacts		Acquisition of any private properties from the new or expanded dam area. Potential indigenous cultural impacts based on preliminary investigations to date. Provides local economic benefits during construction.
Timeframe for delivery		Up to 15 years, including approvals, construction and average fill time for a new dam. Shorter lead time for raising of existing dams.

Key: High  Medium  Low 