November 2020

Water in the Lower Hunter

Planning our water future

Hunter Water 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're discussing with our community as we plan our water future together.

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.

What is currently in place in the Lower Hunter?

Hunter Water has two dams:

- Chichester Dam is an on-river storage located on the Chichester River. It has a total storage volume of 18 billion litres and provides approximately 40% of our water supply.
- Grahamstown Dam is an off-river storage located near Williamtown. Flows are pumped from the Williams River to supplement local runoff to the dam. It has a total storage of 183 billion litres and provides approximately 50% of our water supply.

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, such as a desalination plant, to ensure communities do not run out of water during a severe drought.

Dams 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.

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.

How we're considering this option for the Lower Hunter Water Security Plan

We have worked with the CSIRO using a spatial mapping tool to identify about 10,000 potential dam site locations in the Hunter and surrounding regions. This list was narrowed down by considering a number of factors such as environment and heritage, land use and zoning, dam wall construction requirements, existing water infrastructure, costs and impact on homes, towns, roads, rail and mining.

We have identified Limeburners Creek and Upper Chichester for further investigation as potential new dam sites, should we need to build one in the future.

Summaries of the ecological, geotechnical, and cultural and heritage studies completed for the dam investigation areas are available at yourvoice.hunterwater.com.au

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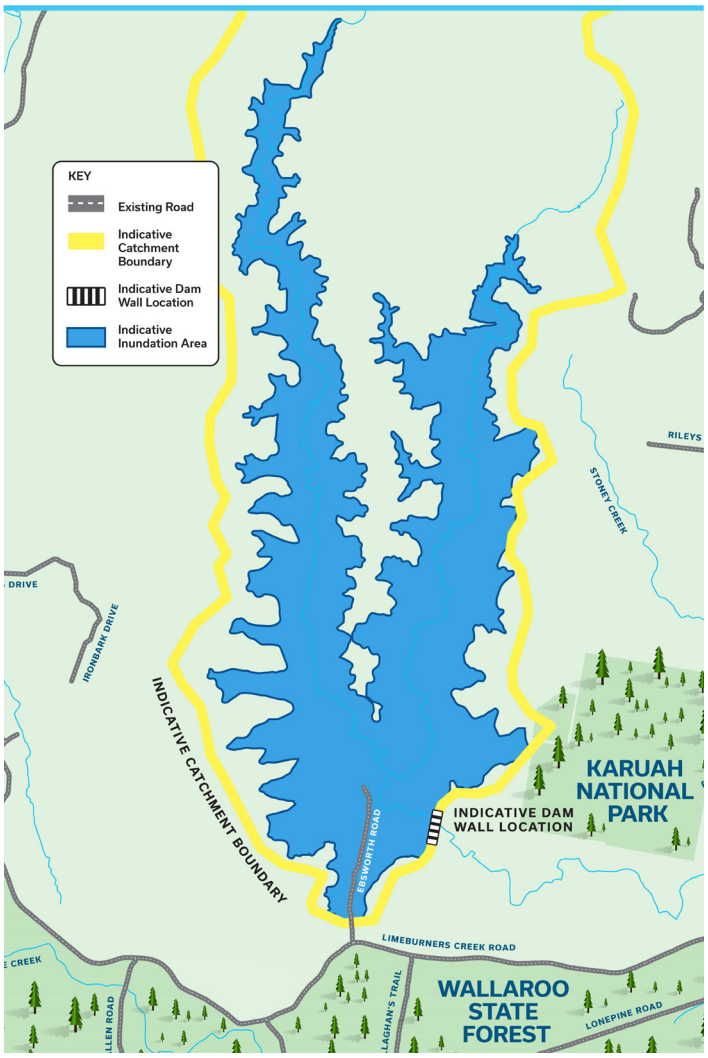
Limeburners Creek Dam is a potential 160 billion litre dam to the east of Clarence Town. The off-river dam would be filled with water pumped from Grahamstown Dam via a linking pipeline. This dam would work as a storage expansion for Grahamstown Dam.

There is also an option to extend the pipeline so that the dam can provide water directly to Grahamstown Water Treatment Plant.

Key results

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

Additional sustainable supply	26 billion litres per year
Indicative cost to build	$880 million
Indicative cost to operate	Less than $1 million per year
Comparative water supply cost*	$1.77 per kilolitre
Reliability and resilience	Increased storage improves the robustness of our system Relies on rainfall and doesn't ensure an ongoing supply in long and severe droughts Not adaptable to be staged or upgraded in future
Environmental impacts	Impacts on terrestrial and aquatic biodiversity. We have included additional biodiversity protection and enhancement measures beyond mandatory requirements under legislation to reduce these impacts Low energy use and associated greenhouse gas emissions
Cultural and social impacts	Acquisition of around 12 properties from the 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



Off-river dam at Limeburners Creek

** The comparative water supply cost is an annualised cost that allows for comparison of options of varying scales and timeframes. The measure incorporates the whole-of-life cost to build and operate the option and the additional sustainable water supply the option provides. The measure does not assess the increment of demand served or the level of ongoing supply in a long and severe drought. Costs are indicative of 2020/21 dollars.*

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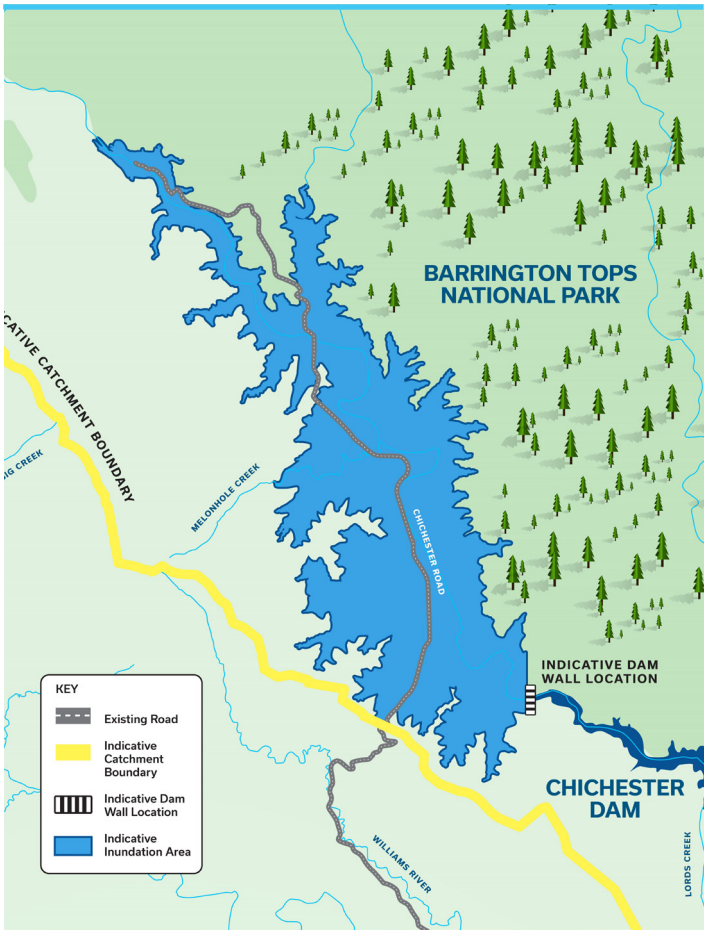
Upper Chichester Dam is a potential 230 billion litre dam located upstream of Chichester Dam. The on-river dam would be filled by flows from the Chichester River, without inundating any of the national park or world heritage area.

This dam would work as a storage expansion for Chichester dam and use the same delivery infrastructure.

Key results

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

Additional sustainable supply	22 billion litres per year
Indicative cost to build	$1.05 billion
Indicative cost to operate	Less than $1 million per year
Comparative water supply cost*	$2.71 per kilolitre
Reliability and resilience	Increased storage improves the robustness of our system Relies on rainfall and doesn't ensure an ongoing supply in long and severe droughts Not adaptable to be staged or upgraded in future
Environmental impacts	Impacts on terrestrial and aquatic biodiversity. We have included additional biodiversity protection and enhancement measures beyond mandatory requirements under legislation to reduce these impacts Low energy use and associated greenhouse gas emissions
Cultural and social impacts	Acquisition of around 14 properties from the 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



On-river dam at Upper Chichester

** The comparative water supply cost is an annualised cost that allows for comparison of options of varying scales and timeframes. The measure incorporates the whole-of-life cost to build and operate the option and the additional sustainable water supply the option provides. The measure does not assess the increment of demand served or the level of ongoing supply in a long and severe drought. Costs are indicative of 2020/21 dollars.*