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: Desalination

What is it and how does it work?

Desalination is the process of removing salts from saline or brackish water to create freshwater suitable for drinking.

A process called reverse osmosis is commonly used, where the saltwater is pushed through a membrane (a barrier with tiny holes) to remove the salt and mineral content.

The size of a desalination plant can range from a small unit the size of a shipping container to large plants which can provide hundreds of millions of litres of water a day.

What is currently in place in the Lower Hunter?

We have been progressing with a concept design and environmental approvals for a desalination plant at Belmont that will only be constructed in the unlikely event of a severe and ongoing drought.

This 'drought-readiness' measure was an outcome of the 2014 Lower Hunter Water Plan. If built, the plant will be capable of producing up to 30 million litres of drinking water per day.

Things we need to consider

Desalination provides a reliable source of water that is not dependent on rainfall. It offers flexibility as a desalination plant can be turned off, or its production capacity reduced, when other water is available.

Desalination plants have high upfront costs related to membrane treatment and power infrastructure. Ongoing operational costs are also relatively high due to high energy use.

The direct environmental impact of a desalination plant can be managed through careful design and operation.

High energy use will result in greenhouse gas emissions if sourced from fossil fuels. These impacts can be offset, at a cost, by renewable energy production through wind or solar.

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

Two sites for desalination plants have been shortlisted based on a range of criteria, including site availability, proximity to Hunter Water's water distribution network, power supply, access to seawater for raw water intake and brine discharge, and potential environmental and social impacts.

The shortlisted sites are Belmont and Walsh Point (on Kooragang Island). Desalination is being considered at a range of sizes and as both an ongoing baseload water supply option, and a drought response measure

As noted above, a concept design has been completed for a desalination plant at Belmont capable of producing 30 million litres of water per day as a drought response measure.

See **key results table** over page.

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Key results table

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

	Small plant (30 million litres per day)	Medium plant (60 million litres per day)	Large plant (90 million litres per day)
Additional sustainable supply	12 billion litres per year	22 billion litres per year	32 billion litres per year
Indicative cost to build	$260 million	$440 million	$560 million
Indicative cost to operate	$2 million per year	$4 million per year	$5 million per year
Comparative water supply cost*	$1.69 per kilolitre	$1.52 per kilolitre	$1.37 per kilolitre
Reliability and resilience	Does not rely on rainfall which improves the reliability of our system Ensures an ongoing water supply in long and severe droughts Flexible to vary operation based on water storage levels Can be adaptable to upgrade to meet growth requirements or respond to drought		
Environmental impacts	High energy use. We have included offsets for greenhouse gas emissions Low biodiversity impacts		
Cultural and social impacts	Low		
Timeframe for delivery	5-7 years		

** 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.*