



LOWER HUNTER WATER SECURITY PLAN

A WHOLE-OF-GOVERNMENT APPROACH FOR ENSURING THE LOWER HUNTER HAS A RESILIENT AND SUSTAINABLE WATER FUTURE.



Overview

What is the Lower Hunter Water Security Plan?

The Lower Hunter Water Security Plan is a whole of government approach to ensure water security for the Lower Hunter for the next 40 years. Our goal is to provide a resilient and sustainable water future that contributes to regional health and prosperity and is supported by our community.

The scope of the plan covers urban water use in Hunter Water's area of operation.

The plan includes a proposed program of actions to reduce the amount of drinking water we use and increase water supply to homes, business and industry in the Lower Hunter. The plan also includes drought management measures to ensure we are prepared to respond to droughts in the future.

Who has been involved in developing the plan?

The plan is a whole-of-government approach to ensuring the region has a resilient and sustainable water future. Hunter Water has worked in partnership with the NSW Government – Department of Planning, Industry and Environment (Water), government agencies, industry experts, local councils and the broader community to ensure the plan is resilient to change and reflects our community values and priorities.

We always seem to have water, why do we need to change?

Our community has told us they expect a reliable water supply that can withstand drought.

The traditional approach to planning for drought, and the one adopted for the 2014 Lower Hunter Water Plan, accepts a very low risk of running out of water. While the Lower Hunter's existing water supply system performs well in typical climate conditions, it is vulnerable to drought due to the reliance on rainfall, the relatively small size of its storages and high levels of evaporation in the catchment.

The region's water storages can fall from typical operating levels to empty in around two and a half to three years in a severe drought, even with a range of drought response measures in place to slow the rate of depletion. If a severe drought was to continue beyond this, the water supply system could fail and the Lower Hunter could run out of drinking water. Although the likelihood of this occurring is very low, the consequences for the region would be catastrophic.

We know our climate is changing, but we are also learning more about underlying climate variability. New modelling methods and datasets show our water supplies may be less secure than we previously thought. We now understand that there have been droughts far longer and more severe than those observed during the last 120 years.

We also learnt through the recent drought that we need to be prepared for drought before the next drought. Up-front investments and actions are needed now to ensure we have enough time to implement drought response measures should they be needed.

How have we considered climate change?

The NSW Government has invested in new modelling methods and datasets to develop a better understanding of both historical climate variability and likely future climate conditions. This modelling shows our water supplies may be less secure than we previously thought. We now understand that there have been droughts far longer and more severe than those observed during the last 120 years.

Data reconstructed from before instrumental records began, using sources such as tree rings, cave deposits and coral growth (referred to collectively as paleoclimate data), also indicates that we could see higher temperatures and less rainfall in the future.

We tested the potential impacts of climate change on the supply and demand for water in future.

Community consultation

How have the community been involved?

An extensive engagement program to understand community views, values and preferences has informed decision-making for the Lower Hunter Water Security Plan. Across three phases of engagement, Hunter Water have used a wide range of communications and engagement tools and techniques, both qualitative and quantitative to ensure there was opportunity for the community to provide feedback on the plan.

There have been many engagement opportunities since 2018 including:

- A dedicated community liaison group
- deliberative forums
- online community surveys
- dedicated website
- focus groups with non-residential customers
- surveys at events and on engagement microsite

What were our community's priorities for the plan?

Community engagement and discussions throughout the review of the Lower Hunter Water Security Plan indicates that our community wants:

- A safe and reliable water supply that can withstand drought
- Consideration of all options
- Investments to reduce demand for drinking water
- Investments to minimise the environmental impacts of water supply initiatives
- A collaborative approach with stakeholders and the community
- Continued use of water restrictions to make the most of our water resources in drought

- Up-front investments to reduce drought risks, as opposed to acting reactively during drought.

How has the community helped shape the plan?

Understanding community values and preferences has been a key part of developing the Lower Hunter Water Security Plan. We have considered these values and preferences in the decision-making process alongside robust analysis of a range of policy, planning and infrastructure options.

Community values underpin the goals and objectives of the Lower Hunter Water Security Plan and have informed the strategic priorities and decision-making criteria. Community preferences across a range of supply and demand options were used to inform the development of a range of options considered in the development of the plan.

Actions in the plan

What sort of actions are included in the plan?

The plan proposes a diverse range of infrastructure, planning, policy, and monitoring and evaluation actions. The plan includes actions to:

- reduce the amount of drinking water we use
- increase the supply of water
- measures to respond to drought
- protect drinking water quality
- improve broader social and cultural outcomes.

Is any major infrastructure proposed to be built?

Yes, the plan proposes to build a new desalination plant at Belmont as a permanent water supply source, and working with the NSW Government to progress the Glennies-Lostock scheme and offtake infrastructure on the Paterson River.

Why can't we just save more water through water conservation and recycling more?

In line with our community's preferences, the Lower Hunter Water Security Plan includes ongoing investment in water conservation, reducing leaks throughout our water system and new recycled water schemes to make the most of our existing resources. However, these programs are not enough on their own to meet our community's expectation for a reliable water supply that can withstand drought.

We also need to increase the supply of water so that we can meet our community's minimum water needs in drought and prepare us for a future with a growing population and an uncertain climate.

How did you decide what to include in the program of actions?

Extensive economic modelling and financial analysis, along with an assessment of social and environmental factors and consideration of community values and preferences, were used to select the proposed program of actions.

The major infrastructure investments included in the plan provide the maximum net benefit (considering social, economic and environmental factors) to the NSW community, as well as comprising the most efficient program of actions from the Lower Hunter community's perspective across the programs assessed.

What are the priorities and actions for the Lower Hunter water system?

Priority 1: Safe and reliable drinking water

Safe drinking water is our highest priority. We will continue to provide high-quality drinking water for the health and wellbeing of our community and the future prosperity of the region by:

- investing in catchment management and protection
- maintaining our multiple-barrier approach to supplying safe drinking water.

Priority 2: Making the most of what we've got

We will manage our existing water resources wisely, working together with our community and stakeholders to make the most of our existing water resources through:

- increased investment in water conservation programs to support our customers and community to reduce water consumption by up to 17% (compared to 2018 levels)
- continuing to reduce leaks in our water network
- working with customers to increase the supply of recycled water for non-drinking purposes
- continuing to talk to our community about purified recycled water and building a purified recycled water demonstration plant in the region.

Priority 3: Improving the resilience of the system

Our climate is changing, and the future is uncertain. We will act to improve our resilience to drought as well as remain adaptive to future risks and opportunities.

There are actions to increase our water supply including

- a new permanent desalination plant at Belmont
- continuing to share water with the Central Coast region

- connecting to the Upper Hunter system via the proposed Glennies-Lostock Scheme.

There are also actions to prepare and respond to drought including:

- retaining permanent water conservation measures – Smart Water Choices
- retaining current water restriction levels
- readiness activities for a drought response desalination plant at Walsh Point.

Priority 4: Water for life

Our water system is underpinned by healthy ecosystems and is essential to support liveable communities. Our plan will work to protect and restore our environment and ecosystems, support liveable communities and incorporate the values and participation of First Nations/Aboriginal people.

These actions focus on water policy and planning:

- improving knowledge sharing with First Nations/Aboriginal people and increasing participation in water planning
- working with our stakeholders to improve integrated land use and water planning.

Catchment management and protection

What is catchment management?

A catchment is an area where water is collected by the natural landscape. We use the water collected from our catchments to help supply water for our needs, by building dams and weirs, or tapping into groundwater.

Human activities affect the health of our water catchments and the volume and quality of water from these areas. Catchment management involves working with local councils, landholders, government agencies and industry so that everyday activities in the catchment do not harm the environment that our drinking water comes from.

What actions are there in the Lower Hunter Water Security Plan for catchment management?

We will continue to invest in catchment management and catchment protection to ensure we are maintaining a robust multiple-barrier approach to drinking water quality and are making the most of our existing water resources.

We will continue to work collaboratively with landholders and stakeholders to protect water quality in our catchments.

Are we looking to increase catchment protection provisions?

We will continue to work collaboratively with landholders and government agencies to balance the development needs of a growing region with the provision of healthy water catchments that will deliver high quality water. We are not proposing any changes to Hunter Water's provisions in the legislation.

What are the benefits of catchment management?

Looking after our catchments is the first step in protecting our drinking water supply. It also provides broader environmental and social benefits through improved catchment and waterway health.

We're making the most of our existing water resources so we're only investing in new water sources when they are needed.

What is a multiple-barrier approach?

Managing drinking water quality begins at the start of the water cycle – whether that is in the catchment the moment rain falls for our dams, or in the ocean for a desalination plant – right through to consumers turning on their taps.

At each stage of the water collection, storage, treatment and delivery processes there are opportunities to manage water quality. This is called the multi-barrier approach - where water quality risks can be prevented or managed at multiple points of the process, not just relying on a single barrier in the supply system.

Water conservation

What is water conservation?

Water conservation is the practice of using less water, or using it more efficiently, to reduce water usage. Water conservation programs aim to reduce the demand on drinking water supplies by:

- identifying and repairing leaks in Hunter Water owned and privately-owned water systems
- using water more efficiently.

What water conservation measures are in place now?

We have worked with the Lower Hunter community and businesses to reduce the amount of water used by:

- reducing leaks using leak detection programs, monitoring the system and reducing response times to reported leaks
- working closely with the business community to identify ways to save water together
- promoting programs to help save water in homes and encourage water conservation practices
- community engagement to learn how to save water together.

What actions are proposed in the Lower Hunter Water Security Plan for water conservation?

We will continue to build on our strong record in water conservation by:

- continuing to invest in reducing leaks from the water distribution system
- continuing to strengthen our Love Water program and permanent water conservation measures, Smart Water Choices, to encourage long-term behavioural change across our region
- supporting customers to find and repair leaks
- expanding the schools' program to help students save water at school and at home
- working with major and large water customers, councils and businesses on water efficiency management plans and alternative water supply projects.

The proposed actions are aimed at achieving up to 17% reduction in water consumption over the next ten years.

What are the benefits of water conservation?

Water conservation is key to managing the current and future supply and demand balance by doing more with less. Benefits include reducing the amount of water extracted from the environment for consumption, and reducing the amount of water that is treated and pumped around the system.

How reliable are water conservation measures at reducing demand on our water supply?

Water conservation programs rely on water efficient behaviours and the adoption of water efficient appliances across the community.

The effectiveness of water conservation programs can be difficult to measure because demand for water is heavily influenced by weather which can often mask changes in consumption.

Recycled water

How much water do we currently recycle?

Recycled water schemes in the Lower Hunter produce around 8 billion litres of recycled water each year, which is the equivalent of around 12% of the total wastewater generated. Of this amount, around 6 billion litres per year replaces drinking water. Recycled water is used for a range of activities that do not require water of drinkable quality.

There are also several private, localised residential recycled water supply schemes in the Lower Hunter.

How is water recycled?

Recycled water involves the treatment of wastewater (sewage) or stormwater to a standard suitable for a variety of uses, such as industrial and commercial uses, toilet flushing or irrigation of parks, gardens, crops and golf courses.

The process relies on advanced water treatment, such as UV disinfection or chlorination.

Water sourced for recycling projects is treated according to the Australian Guidelines for Water Recycling, which means it is safe for its intended use.

What actions are proposed in the plan for recycled water?

Proposed recycled water actions include:

- working with industrial customers to increase the supply of recycled water for industrial processes
- working with local councils to deliver local recycled water schemes for irrigation at local sporting fields and parks
- working with local councils and developers to explore viable opportunities for recycling in new residential developments.

The proposed actions are estimated to increase the supply of recycled water for non-drinking by 1.3 billion litres per year.

What are the benefits of recycled water?

Recycled water schemes reduce demand on our drinking water supplies.

Recycled water is a reliable source of water that doesn't rely on rainfall and

- provides an alternate source of water for non-drinking water purposes
- supports liveable communities by irrigating parks and sporting fields
- helps delay the need for major water supply augmentations in the future.

Using recycled water delivers environmental benefits by reducing the volume of wastewater and stormwater discharged to waterways.

Why don't we recycle more?

Recycling water schemes rely on end uses such as industry or parklands to be located close to existing treatment infrastructure. Costs involved in constructing additional treatment and reticulation infrastructure can be relatively high compared to other options, particularly for schemes that produce relatively small volumes of water.

Is recycled water safe?

Recycled water is treated and monitored according to the Australian Guidelines for Water Recycling, which means it is safe for its intended use.

Purified recycled water for drinking

What is purified recycled water?

Purified recycled water is high-grade, ultra-clean water produced by taking treated wastewater or stormwater, and treating it further through advanced treatment processes, to filter and purify it before adding it to an existing water source, such as dams or aquifers (groundwater). Water is treated again when extracted from the water source to ensure it meets Australian Drinking Water Guidelines and is safe to drink.

Is it the same as other recycled water?

No, purified recycled water begins with recycled water and puts it through further treatment steps, to make it high-quality, safe drinking water.

Does the plan consider using recycled water for drinking?

Yes, the plan proposes actions to continue to explore purified recycled water for drinking as a potential future option to augment our drinking water supply. The plan proposes further engagement with our community and stakeholders about this option and the construction of a small demonstration plant and education facility to help the community understand the water cycle and the potential role purified recycled water could play in our regions' water future.

Does the plan commit us to using purified recycled water for drinking?

No, it doesn't. The plan only proposes to continue to explore purified recycled water as a potential future water supply option.

The plan proposes to engage with the community and stakeholders about the option and build a demonstration plant to help the community better understand the option.

The demonstration plant will not be connected to Hunter Water's supply system.

We will continue to work with our community to understand their views on purified recycled water as a potential future source of water for our region.

Do any other cities use purified recycled water?

Yes, purified recycled water is now part of the water supply mix in over 35 cities around the world, especially in America.

Across Australia, Perth already has an active groundwater replenishment scheme using recycled wastewater; Orange, NSW has an active stormwater recycling scheme; and Seqwater's drought response plan includes turning on the Western Corridor scheme if their dams drop to 40%.

Why are we considering purified recycled water for drinking?

All water is recycled as part of the natural water cycle. Informal recycling happens all around the world wherever upstream towns discharge wastewater to rivers that is treated and used by downstream towns for drinking water.

Purified recycled water for drinking is a safe and reliable water supply option that offers several benefits as a potential future water supply option for the region.

What are the benefits of purified recycled water?

Purified recycled water for drinking is a safe and reliable, rainfall-independent source of water and is often lower in cost and more energy efficient than other rainfall-independent options like desalination. It is also an environmentally friendly option that reduces the water taken from the environment and also reduces nutrient discharges to waterways associated with effluent discharges from our wastewater treatment plants.

Is purified recycled water safe to drink?

Yes, purified recycled water is safe to drink. Like the rest of our water supply system, any new purified recycled water scheme would be subject to strict treatment, monitoring and regulation.

Water is treated through several stages. Each stage uses a specific technology or control point which play a specific role to manage any impurities in the water. This is referred to as a multi-barrier approach.

Any potential scheme would be developed in close consultation with health authorities and experts and meet Australian Drinking Water Guidelines.

Interregional water sharing

What is water sharing?

Water sharing involves moving water across regions to where it is needed most through a network of pipes and pumps.

Do we currently share water with other regions?

Yes. Hunter Water and Central Coast Council have an existing pipeline connecting the two regions. The pipeline can transfer water in either direction according to established water sharing rules.

What actions are there in the plan for water sharing?

We will continue existing water sharing arrangements with the Central Coast and enhance them where possible to ensure both regions are best placed to respond to drought, operational needs, meet future growth requirements and adapt to climate change.

The NSW Government has commenced planning for a proposed two-way pipeline to connect Glennies Creek Dam and Lostock Dam in the Upper Hunter. Should the pipeline proceed, Hunter Water could connect to the scheme via a new offtake on the Paterson River.

What are the benefits of water sharing?

Water sharing allows water to be transferred to where it is needed most. It optimises existing infrastructure to take advantage of variations in rainfall distribution and storage capacities.

The Glennies-Lostock Scheme would improve regional water resilience linking the Upper Hunter, Lower Hunter and Central Coast water systems.

Desalination

What is desalination?

Desalination is the process of removing dissolved salts and other particles from seawater to bring it to drinking water standards.

Desalination is an important climate-independent water supply option and was originally identified in the 2014 Lower Hunter Water Plan as a drought response measure.

How do we use desalination currently?

We don't have a permanent desalination plant in the region. Drought response desalination was proposed in the 2014 Lower Hunter Water Plan. A drought response desalination plant, located at Belmont, has recently been approved by the NSW Government. The plant would be capable of producing up to 30 million litres of water per day in response to a severe drought.

What actions are there in the plan for desalination?

As investigations for the Lower Hunter Water Security Plan progressed, a permanent desalination plant at Belmont emerged as a key action for securing our water supply in the future.

We have completed readiness activities for the recently approved drought response desalination plant at Belmont. The Lower Hunter Water Security Plan proposes to seek the necessary approvals to allow a permanent desalination plant to be built now and operated as part of our permanent water supply.

What are the benefits of desalination?

A permanent desalination plant at Belmont would add a new baseload, climate-independent water source to the Lower Hunter water supply system. This would reduce the likelihood of introducing severe water restrictions in drought.

The plant will supply water on an ongoing basis which will keep storage levels higher, rather than the previously proposed drought response plant that would only supply water when water storages have reached critical levels.

The plant improves the diversity of the water supply system and the resilience of the system to respond to shocks.

How will you reduce the impact of operating a desalination plant?

Greenhouse gas emissions from desalination will be incorporated into Hunter Water's Carbon Strategy, currently under development.

Why have we changed from a drought response to permanent desalination plant?

Desalination as a water supply option was originally identified in the 2014 Lower Hunter Water Plan as a drought response measure.

As investigations for the Lower Hunter Water Security Plan progressed, a permanent desalination plant emerged as a key action for securing the region's water supply in the future. We found that a permanent desalination plant is a cost-effective water supply option that provides an ongoing supply of climate independent water, improves the reliability of our overall system, slows the depletion of our water storages during drought, and defers future water supply augmentations.

Why are we proposing two different desalination plants?

The new plant at Belmont is proposed to operate on a permanent basis and would provide an ongoing supply of up to 30 million litres per day. This will improve the reliability of our system; however, it would still only provide about a quarter of the community's restricted water needs in a long and severe drought.

We investigated upsizing the Belmont plant beyond 30 ML/day however there are constraints associated with the site and existing infrastructure in the area.

We are therefore planning for a second desalination plant at Walsh Point, at the eastern end of Kooragang Island, to provide additional supply in the event of drought. We will complete readiness activities now but will only build the plant if needed in drought.

Groundwater

What is groundwater?

Groundwater is one of the most common water sources used throughout the world. Groundwater can be found in fractured rock or layers of sand and gravel called aquifers. Aquifers provide natural underground reservoirs that can offer a reliable supply of water, even in times of drought.

Water is pumped out of the ground through wells and treated to drinking water supply. All naturally occurring groundwater originally came from rainfall, though this may have occurred a very long time ago.

How do we use groundwater currently?

Around 11% of water in the Lower Hunter is supplied from groundwater sources.

The Tomago groundwater source is typically only used during drought or if required for operational reasons. We also source water from the Tomaree groundwater source to supply the eastern end of Port Stephens.

What actions are there in the plan for groundwater?

Water-bearing sands and gravels associated with the ancient Hunter River and Karuah River systems have been identified deep beneath the Tomago Sandbeds. Water held within these gravels and sands, referred to as palaeochannels, may be suitable as a future water supply option.

The plan proposes continued investigation of this potential water source. The investigations will include using several water supply test bores to measure water quality and understand how the aquifer responds to pumping.

If testing shows the resource can successfully be accessed, further investigations will be required to determine if this water could become a long-term, sustainable source for the region.

What are the benefits of groundwater?

Groundwater is generally a low-cost water supply option with low social and environmental impacts.

The palaeochannel may provide freshwater to add to our supply system or, alternatively, provide an additional underground water storage which could be replenished during times of significant rainfall for use during drought.

Dams

How are we using dams now?

Most of the water for the Lower Hunter is supplied from two dams.

The Chichester Dam is an on-river storage located on the Chichester River. It has a total storage volume of 18 billion litres and provides, on average, 28% of the region's current water supply. Chichester Dam was constructed between 1915 and 1926.

Grahamstown Dam is an off-river storage located near Williamstown. 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, on average, 51% of the Lower Hunter's current water supply. Grahamstown Dam was constructed between 1955 and 1965.

Are any new dams proposed?

No. Following a rigorous short-listing process, we investigated two areas in detail – Upper Chichester and Limeburners Creek dams. Dams were not favoured based on financial, social and environment impact assessment, and were less favoured by our community as a future water supply option for our region.

Are we making the best use of our existing dams?

We optimise the operation of our existing dams given streamflow, reliability and environmental protection requirements.

We also benefit from storages on the Central Coast through an interconnecting pipeline that links the Hunter Water system to Central Coast Council. We will continue existing water sharing arrangements and enhance them where possible to ensure both regions are making the best use of all our dams.

The plan proposes a new water supply scheme linked to the NSW Government's planned project to connect the Glennies Creek Dam and Lostock Dam in the Upper Hunter. By connecting these two storages, water can be moved from the high rainfall catchment in the east to the large storage in the west, optimising use of existing infrastructure in the region. Hunter Water would then be able to connect to this new scheme via a new offtake on the Paterson River.

Was the previously proposed Tillegra Dam shortlisted for consideration?

No. The previously proposed Tillegra Dam was ruled out through a planning assessment process in 2010. Better dam investigation areas were identified as part of this review.

General

Will any of the actions reduce our drinking water quality?

No. The actions proposed in the plan will ensure drinking water continues to meet strict water quality requirements in line with the Australian Drinking Water Guidelines.

How does the Lower Hunter Water Security Plan align with water planning work in the Central Coast?

The NSW Government, Hunter Water and Central Coast Council have worked closely to analyse and model infrastructure and operational options that make best use of available water across the Hunter and the Central Coast, including the existing inter-regional transfer pipeline. Infrastructure proposed in both the Lower Hunter Water Security Plan and the Central Coast Water Security Plan has been considered with the best overall outcomes for the broader region in mind.

How will the actions be funded?

The proposed actions are likely to increase annual residential customer water bills by between \$75 to \$120 (a one-off increase of between 6 and 9 per cent for the average residential customer).

Customer bills will not change (other than being indexed for inflation) before 1 July 2025. Beyond that the investments proposed would be reflected in customer bills, subject to approval by the NSW Independent Pricing and Regulatory Tribunal.

The proposed actions will improve the security of our water system to withstand drought. In the unlikely event we need to construct a drought response desalination plant in addition to these investments, the average annual household bill would increase by around a further \$100.