# **Department of Climate Change, Energy, the Environment and Water** dcceew.nsw.gov.au



## Recycled WaterRoadmap

June 2025



## **Acknowledgement of Country**

The Department of Climate Change, Energy, the Environment and Water acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Recycled Water Roadmap

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#### More information

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## Our commitment to water recycling

Water is a finite resource that is essential to life. It is fundamental to health and well-being and critical to a functioning economy. Climate change means that NSW will confront more frequent and more severe droughts, more storm events and higher temperatures. To prepare, cities and towns will need to transition to more secure water supply options, diversify water sources and increase the proportion of water that does not depend on rainfall by increasing water recycling and desalination

We will also need to be more efficient with the water we currently use in households and industry, and use land use planning and urban design to better integrate the way we manage urban water.

Water recycling is a key component of integrated water cycle management. One objective of the NSW <u>State Infrastructure Strategy</u> is that the Government enhances long-term water security, by embedding integrated water cycle management approaches, including recycled water and stormwater harvesting, in land use planning and major projects.

Retaining water in highly urbanised landscapes can help our cities and towns to maintain green spaces and tree canopy during drought conditions, sustain recreational areas, contribute to urban cooling and improve waterway health. This is achieved through stormwater management, recycling and integrating water bodies into urban design.

To build resilient communities we need to draw on a range of water sources. Currently, recycled water is underutilised in NSW, although it has significant potential to improve water security, deliver environmental benefits, mitigate urban heat island effects, and support growth and development. Purified recycled water for drinking, or options for supplying fit-for-purpose water for industry, agriculture, and for maintaining green spaces, will reduce reliance on drinking water supplies and improve environmental water quality.

The <u>NSW Water Strategy</u> commits to supporting water utilities to diversify sources of water including groundwater, stormwater harvesting and recycling. Our Metropolitan Water Strategies and Regional Water Strategies also commit to a range of specific actions for recycled water across NSW (Table 1)

Table 1 Actions under the metropolitan and regional water strategies that reference water recycling.

| Strategy                         | Actions                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Greater Sydney Water<br>Strategy | <ul> <li>Implementation Plan Action 2.5b - Construct and commence operation of a purified recycled water demonstration plant.</li> <li>Implementation Plan Action 25c - Engage with the community to understand preferences for additional water supplies — including purified recycled water — and demand management measures to secure water supplies and help make Sydney a more liveable city.</li> </ul> |  |  |

| Strategy                                         | Actions                                                                                                                                                                                                                                   |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lower Hunter Water<br>Security Plan              | <ul> <li>Priority 2 - Increase recycled water use for non-drinking purposes.</li> <li>Priority 2 - Engage with the community on purified recycled water and build a purified recycled water demonstration plant in the region.</li> </ul> |
| Macquarie Castlereagh<br>Regional Water Strategy | <ul> <li>Implementation Plan Action 1.5 - Invest in innovative water<br/>management options including water treatment and reuse<br/>initiatives.</li> </ul>                                                                               |
| Far North Coast Regional<br>Water Strategy       | Implementation Plan Action 4.8 - Develop a recycled water plan for the Far North Coast.                                                                                                                                                   |
| Namoi Regional Water<br>Strategy                 | Implementation Plan Action 1.4 - Progress water treatment facilities for industries reliant on town water supplies.                                                                                                                       |
| North Coast Regional Water<br>Strategy           | Implementation Plan Action 3.5 - Increase use of recycled water<br>and investigate increased use of tertiary-treated and on-farm<br>recycled water for intensive horticulture.                                                            |

We recognise that water recycling is a key part of our water future, and addressing the barriers to broader implementation is critical. While our water strategies recognise the drivers and the need for recycled water, the Recycled Water Roadmap sets out how we will work across government to remove the policy and regulatory barriers. We understand that recycled water is not a cost-effective option for all locations, but where it is a good solution, we want to facilitate its use.

Realising the benefits of recycled water also support implementation of other Government policies and strategies including the Greener Places Framework, the Housing Approval Reform Action Plan, and the Circular Economy Policy.

As recommended by the State Infrastructure Strategy, the Recycled Water Roadmap focuses on how we can support delivery of recycled water for both drinking and non-drinking uses, and how we enable planning, engagement, and delivery of recycled water solutions.

#### Our vision for the future of water recycling in NSW is:

- Utilities consider recycled water equally with other supply and demand options
- Increased delivery of recycled water solutions that improve diversity of water sources, resilience, urban cooling and environmental water quality
- Communities understand water recycling options and engage with utilities in the conversation on purified recycled water for drinking.

We have identified 5 priorities to be addressed through a set of 14 actions over the next 2 years (Table 2). We commit to reviewing the Roadmap to monitor progress of implementation and to identify new opportunities over the next 5 years.

Table 2 Five priority areas to be addressed over the next 2 years.

| Priority area                               | Description                                                                                                           |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Early strategic planning                    | We need state-wide planning and policy frameworks that support integrated and coordinated planning for recycled water |
| Economic tools and guidance                 | We need tools and resources to support utilities in planning and delivering recycled water solutions                  |
| Co-ordination and regulatory change         | We need clear regulatory and approvals processes in place for recycled water                                          |
| Resources and collaboration                 | We need to build capacity and capability to plan and deliver innovative recycled water solutions across the sector    |
| Public engagement and Australian guidelines | We need to take steps now so that purified recycled water for drinking is an option for the future                    |

### Where we are now

All water is recycled. The water we have today is all that we have. It's the same water that existed on Earth billions of years ago. Water continually recycles in the environment to maintain life and ecosystems. It is transported and treated naturally through a series of processes including precipitation, infiltration and evaporation – the natural water cycle.

In urban areas, we change the water cycle to capture, store, treat, divert and distribute water and wastewater using a network of pipes, dams, reservoirs, and treatment plants. This allows us to provide essential water and wastewater services to our cities and towns. This changed cycle is referred to as the urban water cycle, where we manage the natural water cycle to meet our community's needs. Water is used within the urban water cycle for drinking, maintaining green spaces, agriculture, and manufacturing while supporting our ecosystems. Cities and towns are increasingly integrating the urban water cycle to maximise water efficiency, reduce urban heat, increase resilience, improve water quality and reduce flood risks.

Most cities and towns in NSW use surface water from dams and rivers to supply drinking water. Groundwater can also be used as the sole supply of drinking water or used to supplement surface water during drought. Both surface water and groundwater are processed in **water treatment plants** to produce safe drinking water. Coastal cities like Sydney, the Gold Coast and Adelaide can also access seawater that is processed in **desalination plants** to supplement their drinking water supply.

All wastewater from homes, commercial and industrial premises is processed at wastewater treatment plants before it is returned to the environment or reused. Advanced wastewater treatment facilities can treat water further so that it can be used in homes for non-drinking purposes, like laundry and toilet flushing. It can also be further purified to produce water that is safe for drinking.

Water is a precious resource, and by being water wise and recycling more water in our urban environments, we can secure water supplies to meet the needs of growing communities.

Figure 1 shows typical water infrastructure in both coastal and inland cities and towns and the sources of water that can be recycled. These include:

- Wastewater water collected from showers, kitchens, laundries and toilets from domestic and commercial premises. This includes greywater (wastewater minus toilet water).
- Harvested stormwater run off water collected from impervious surfaces, like roads and footpaths, during rain events.

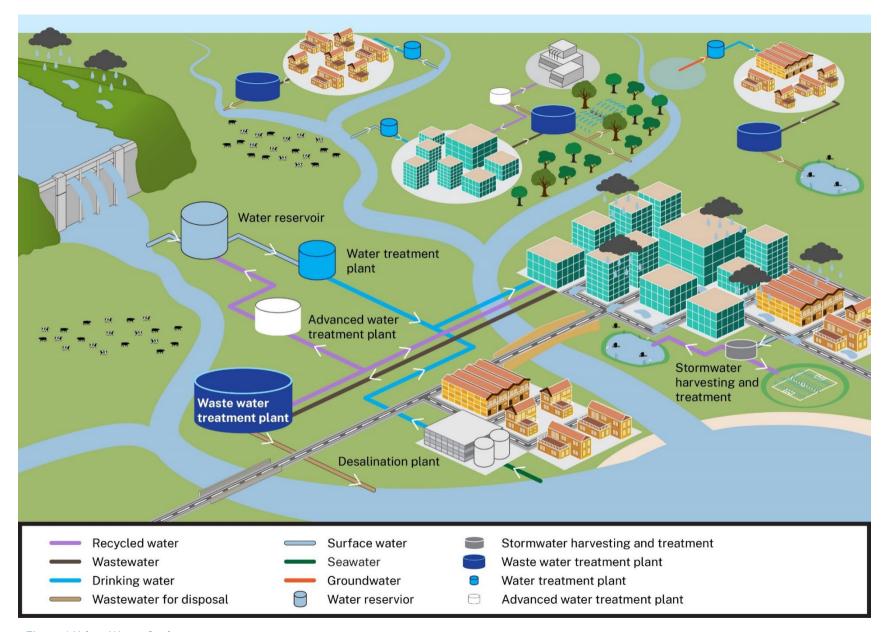


Figure 1 Urban Water Cycle

#### How water is recycled

Water recycling refers to the treatment and reuse of wastewater and harvested stormwater that is treated in and outside the home, in industry, and for agriculture.

In water recycling, treatment technologies are designed to reduce or eliminate nutrients, chemicals and disease-causing organisms like viruses and parasites (pathogens) to safe levels. These technologies are used to treat wastewater and stormwater for various uses, including for drinking. Processes like biological treatment, filtration, chemical or ultraviolet disinfection and reverse osmosis are also used in various combinations. The level and type of treatment is determined by both the amount of contamination in the source water, and the final intended purpose of the water.

Recycled water is assured to be safe for all uses through a stringent quality assurance program that uses national guidelines. The <u>Australian Guidelines for Water Recycling</u> must be used by every water utility in NSW that recycles wastewater. Where recycled water will be used for drinking, utilities must also apply the <u>Australian Drinking Water Guidelines</u>.

Both sets of guidelines require that all water recycling schemes use multi barrier treatment systems, meaning that the water will be safe even if one treatment process fails. Continuous monitoring of each treatment process also gives early warnings of potential problems so that they can be prevented.

Recycled water can be categorised based on its intended final use, either non-potable (non-drinking), or potable drinking water.

#### Recycled water used for non-drinking purposes

Non-potable reuse schemes treat wastewater or harvested stormwater for non-drinking purposes such as:

- irrigation for gardens, public open spaces and in agriculture
- commercial uses such as washing hard surfaces, dust suppression, and cooling of buildings
- domestic use for toilets and washing machines
- firefighting

The use of non-potable water requires a separate pipe network to ensure that it can be distinguished from the drinking water supply. These are known as 'purple pipe', third pipe or dual reticulation schemes.

As an example, in Sydney's Central Park, a private water utility recycles water in a basement treatment facility. The scheme collects and treats wastewater from apartments, shops and offices to provide recycled water for toilet flushing, washing machines, irrigation, cooling towers and car washing. Figure 2 shows the onsite 8-stage treatment process to produce recycled water. It is distributed to customers through a separate and dedicated purple pipe.

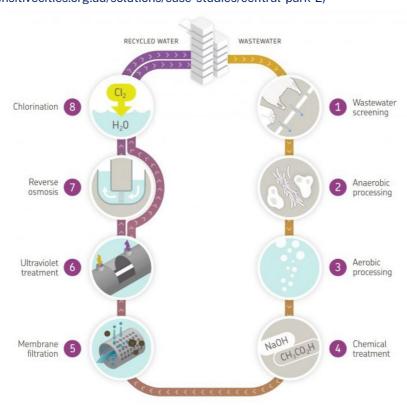


Figure 2 Central Park recycled water scheme operated by the Altogether Group, a private water utility (diagram https://watersensitivecities.org.au/solutions/case-studies/central-park-2)

#### Purified recycled water for drinking

To use for purified recycled water for drinking, it must be treated and disinfected until it meets the Australian Drinking Water Guidelines. The treatment and disinfection processes combine advanced techniques including ultrafiltration, reverse osmosis, ozonation, and ultraviolet disinfection with advanced oxidation. They remove or destroy chemicals and micro-organisms to ensure the water is safe to drink.

To date, purified recycling water relies on the use of reverse osmosis to remove salts. However, the technology for advanced water treatment is changing rapidly, with new innovations that eliminate the need for reverse osmosis. This reduces operational costs and the problems associated with disposal of concentrated salt and organic substances known as the brine.

After purification, the water can be added to the drinking water supply through:

- <u>Environmental buffers</u>. This is where the purified recycled water is added to existing dams, reservoirs or waterways where it mixes with surface water before being extracted, treated again and provided to the community. This is known as "indirect potable reuse".
- Aquifer recharge. This is where purified recycled water is injected into groundwater aquifers
  that store and naturally filter the water, before it is extracted, treated again and provided to
  the community. This is a form of indirect potable reuse known as "managed aquifer
  recharge".
- <u>Direct to distribution</u>. This is when purified recycled water is added directly to the beginning of a water filtration plant or into the existing drinking water supply network. This is known as "direct potable reuse".

Formal, planned schemes to purify recycled water for drinking began in the 1960s and are becoming more common. Purified recycled water has been consumed safely by people for more than 50 years in 40 cities across the world from California, USA to Perth, Australia (Figure 3). This rainfall independent supply secures water for the future and demonstrates the significant trust that can be built with communities to diversify and secure water supplies.

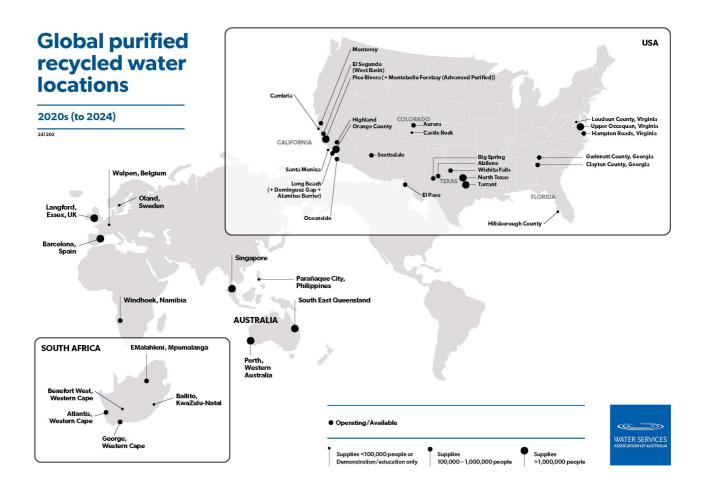


Figure 3 Global locations using purified recycled water for drinking to 2024. (Source: Water Services Association of Australia 2024)

Two full scale purified recycled water schemes using wastewater have been constructed in Australia, both for indirect potable reuse. These are the Groundwater Replenishment Scheme in

Perth (box 1) and the Western Corridor Recycled Water Scheme in South-East Queensland, which is currently supplying purified recycled water to industry.

#### Case study: Purified recycled water in Perth

Perth's Groundwater Replenishment Scheme is the only operational wastewater to purified recycled water for drinking scheme operating in Australia. Stage 1 of the Perth scheme became operational in 2017, injecting 14 GL per year of purified recycled water into the Leederville and Yarragadee aquifers. Stage 2 was completed in 2022 and doubled the scheme to 28 GL of purified recycled water per year and expanded recharge to additional aquifers at Wanneroo and Neerabup. When needed, the water is pumped from the aquifers, treated and supplied for Perth's drinking water.

One of the key reasons for the success of this project was the investment of almost 20 years in scientific and social research, community engagement, and collaboration with regulators. This resulted in bipartisan political support for design, construction, and testing before the scheme was fully operational. Further, the focus of a recycled water solution was on preparing for climate change and future uncertainty rather than to react to drought.

#### Case study: Purified recycled water in Southeast Queensland

The recycled water scheme in place in Southeast Queensland was one of several emergency infrastructure projects completed during the Millennium Drought (2001 to 2009). The scheme can collect and transport large volumes of wastewater to an advanced treatment facility where it is purified and then piped and released into the upper end of Lake Wivenhoe (Wivenhoe Dam), the main drinking water source for the cities of Brisbane and Ipswich.

At capacity, the scheme can add an extra 180 million litres a day to the dam. To date it has not been completely turned on and is currently in care and maintenance mode given limited demand from industry since the end of the drought.

#### The benefits of recycled water

We know we need to make better use of our water resources, think innovatively and find ways to deliver liveable communities and fast-track housing for a growing population. Recycled water is a key part of integrating the urban water cycle, and delivering this Roadmap will put us on the path to unlock a range of benefits, now and into the future:

Table 3 Benefits of water recycling

| Benefits                                                                                           | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Increases water security and system resilience                                                     | Many towns and cities in NSW rely on a single source of water for urban water supply, typically from surface water. A changing climate means we are experiencing less reliable rainfall and more extreme weather including droughts, bushfires and floods. This affects the reliability and quality of these water sources and makes our cities and towns vulnerable to risks.  The 2017-2020 drought highlighted this vulnerability:                                                                                                                                                                  |  |
|                                                                                                    | <ul> <li>more than 50 towns in NSW were at high-risk of failure</li> <li>drought response measures cost the government \$284 million in emergency drought funding</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
|                                                                                                    | The towns of Dubbo and Wellington were 6 months away from running out of water                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|                                                                                                    | Sydney's water storages declined to 40% in 2.5 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
|                                                                                                    | Inland storage levels fell to as low as 10%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
|                                                                                                    | Diversifying our water sources to include recycled water alongside surface water, groundwater and desalinated water offers resilience to respond to system shocks and stresses like natural disasters or population growth.                                                                                                                                                                                                                                                                                                                                                                            |  |
| Reduces reliance<br>on drinking water<br>supplies and<br>supports urban<br>greening and<br>cooling | Recycled water can be used in place of drinking water for industrial processes, garden watering and toilet flushing. It can also be used to provide urban greening and cooling benefits and support urban amenity, like maintenance of sporting fields and parks.  Using recycled water keeps our drinking water storages higher and reduces the likelihood of water restrictions. It can also reduce the costs associated with treatment, if it will not be used for drinking purposes.                                                                                                               |  |
| Reduces<br>pressure on<br>wastewater<br>treatment<br>systems                                       | In some regions, growing populations are putting a strain on existing wastewater treatment systems and driving the need for upgrades. Moving towards a future of purified recycled water has benefits for ageing and atcapacity wastewater systems. This is because diverting volumes of wastewater to a high-quality purified recycled water facility reduces system pressure. This can in turn reduce infrastructure costs like upgrades to wastewater treatment plants to meet environmental protection standards or infrastructure to address wet-weather discharges during heavy rainfall events. |  |

| Benefits                                                               | Comments                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reduces to<br>wastewater<br>discharge to<br>waterways and<br>oceans    | Capturing wastewater for recycling means this water does not need to be discharged to waterways. This reduces the volume of nutrients and other pollutants that are released and improves waterway and ocean health.                                                                                                                                                                                |
| Contributes to energy creation, resource recovery and circular economy | Integrating water systems with other urban management presents significant opportunities for energy and resource recovery. Wastewater contains valuable resources that can be transformed into products that support a more productive and sustainable economy, such as renewable energy, fertilisers, and bioplastics. Recovering and re-using these resources contributes to a circular economy.  |
|                                                                        | Recycled water technology enables us to treat wastewater in a way that creates heat or methane and recovers nutrients and carbon for use other purposes. The co-digestion of wastewater with other food and organic waste streams can create renewable energy and reduces the amount of food waste going to landfill.                                                                               |
| Supports new industries with fit for purpose water                     | Emerging industries will seek sources of water and recycled water could provide an appropriate supply without the need to draw on drinking water. Hydrogen production and cooling water for the expansion of data centres to accommodate generative AI are growing sectors and opportunities are being explored to understand the quality and quantity of water needed to support these industries. |
| Manages local flooding                                                 | In highly urbanised environments with limited pervious surfaces, stormwater can contribute to local flooding. Capturing, storing and treating this rainwater and stormwater provides a flood benefit and reduces the volume of pollutants entering waterways.                                                                                                                                       |

#### Water recycling in NSW

Surface water is the main water supply source in NSW, with recycled water being largely underused as a water source. Overall, less than 10% of the water supplied in NSW comes from recycled water produced from wastewater from domestic and commercial sources. This source of recycled water could provide a reliable, secure and rainfall independent supply.

The Millennium Drought drove investment in recycled water, especially for irrigation and industry. However, recycled water currently makes up only a small portion of the total amount of water that water utilities supply. Since 2018- 2019, the amount of recycled water supplied by metropolitan and regional water utilities as a percentage of total water supplied has not changed significantly.

In regional NSW, most recycled water is used to support agriculture and industry. It makes up a greater percentage of total water supply compared to metropolitan NSW, where recycled water is used for irrigation of public open spaces and non potable domestic purposes (Figure 4).

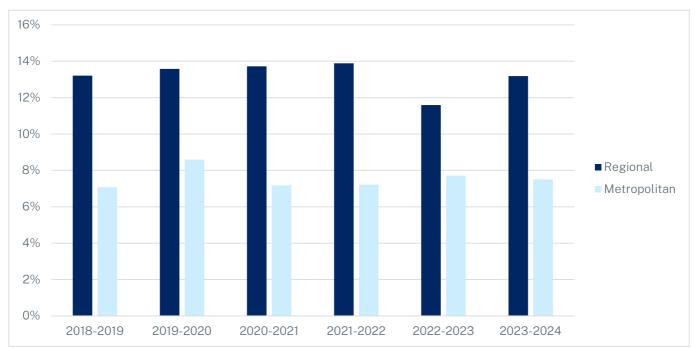


Figure 4 Percentage of recycled water to total water supplied across in NSW for regional and metropolitan utilities in 2023-2024 (data from local water utility performance data and national performance reports)

Recycled water is provided across NSW at all scales by the metropolitan water utilities, local water utilities in regional NSW and by private water utilities in metropolitan developments:



Figure 5 A snapshot of water recycling from domestic and commercial wastewater in NSW 2022-23 (Data from IPART's compliance reports and local water utility performance data)

Across NSW, local government contributes to water recycling. Local metropolitan councils have invested in smaller, decentralised water recycling and stormwater harvesting systems, and are well positioned to to identify local opportunities for water recycling to meet urban sustainability goals. Better integration of water utilities and local government infrastructure can reduce project costs and enhance the scalability of water reuse schemes.

Water recycling can be done at different scales:

- Large, centralised water recycling systems treat high volumes of wastewater requiring extensive networks of pipes and pumps (Figure 6).

- Smaller, decentralised systems are scalable and adapt to changing conditions. They can be expanded and connected to centralised systems to meet wastewater treatment demands and recycled water supply as housing developments and water intensive industries grow. Decentralised systems can also be embedded in within a larger centralised system which can increase resilience of a system and contribute to localised urban greening and cooling (refer example at Figure 2).

Recycling at all scales is required to adapt to local needs and conditions. Our drought vulnerabilities, exposed by the rapid decline in water storages in the 2017-2020 drought, highlight the need to look more closely at water recycling. We need to harness the capacity of metropolitan, regional and private utilities and by councils, because adopting recycling at all scales can help increase water security and resilience. We need to address barriers to recycling and support utilities throughout their planning for, and delivery of, recycled water projects.



Figure 6. An aerial photo of the Parkes Shire Council's Recycled Water Scheme that supplies water for municipal irrigation around Parkes (Courtesy of Parkes Shire Council)

#### Unlocking the benefits of recycled water in Greater Sydney

Greater Sydney contains over 5 million people and expects another 2 million by 2050. This, along with the ongoing challenges of a changing climate, will put pressure on our water supplies. Recognising this, the <u>Greater Sydney Water Strategy</u> (GSWS) identifies an essential role for recycled water in delivering sustainable and resilient water services for the next 20-40 years.

Greater Sydney's water and wastewater services are largely centralised and transfer water from dams in western Sydney to coastal wastewater outfalls in the east. The growing population is

putting increased pressure on these ageing systems, reducing resilience to shocks and stresses over time. Currently, 62 per cent of Sydney's wastewater is processed by 3 coastal Water Resource Recovery Facilities, with the North Head and Malabar locations estimated to reach capacity by about 2031.

Diverting wastewater away from ocean outfalls and towards production of purified recycled water will reduce the need for expensive wastewater system upgrades and reduce future pollutant loads to the ocean.

Using purified recycled water is not only environmentally beneficial but is cost-effective. Planning by Sydney Water indicates that a future with purified recycled water will save billions of dollars by 2050, reducing price impacts on customers

#### A proposed sustainable and resilient water service for securing Sydney's water supply

In the future, highly treated purified recycled water could be used to supplement drinking water, providing up to 25 per cent of Greater Sydney's water needs by 2056.

Sydney Water has commenced project planning for its Purified Recycled Water Treatment Plant at Quakers Hill. The proposed plant is currently listed on the NSW Major Projects website as state significant infrastructure and is at the beginning of the environmental assessment process. The project aims to provide up to 36 ML/day of purified recycled water by 2030, with additional capacity up to 86 ML/day, which will be subject to future projects and approvals. It is proposed that water will be treated at Quakers Hill and transferred to Prospect Reservoir, further treated and then transferred into Sydney Water's drinking water systems.

Purified recycled water facilities of this kind could be built right across the Sydney Water network. This would significantly increase the available rainfall-independent supply and be a cost-effective way to support population growth and continued development in Greater Sydney, in line with long-term population forecasts.

Sydney Water is planning to deliver additional schemes to provide approximately 171 ML/d of purified recycled water by 2033. In the longer term, Sydney Water could produce approximately 285 ML/day of purified recycled water by 2056 from a range of schemes. Purified recycled water projects form part of Sydney Water's long-term capital plan and are proposed in addition to existing and future water supply options, such as the potential expansion of the Sydney Desalination Plant.

#### Advanced water recycling in Western Sydney

The Upper South Creek Advanced Water Recycling Centre in Western Sydney is expected to be operational in 2026. Upper South Creek is a growing region of Greater Sydney, with the area projected to reach a population of 400,000 by 2056 and the Western Sydney Airport due to open in 2026. Construction and operation of the Centre will create around 1,000 new jobs

When completed, this Centre will provide sustainable wastewater services for the South Western and Western Sydney Aerotropolis Growth Areas. High-quality recycled water will be used for a

range of uses, including providing support for new industries, helping green Western Sydney by enhancing biodiversity, and reducing urban heat island effects.

The Centre will produce biosolids that can be used as an alternative to chemical fertilizers in agriculture. It also has the potential to recycle organic waste to generate renewable energy, providing a more sustainable energy supply and contributing to the circular economy.

#### Stormwater harvesting and treatment

In densely urbanised areas with a high proportion of impervious surfaces, precinct scale stormwater harvesting and treatment schemes can provide an alternative water option for open space irrigation, cooling systems and non-potable domestic and commercial use.

Within Sydney, Green Square is the largest development making use of stormwater harvesting and treatment, sourcing up to 0.3 GL of water per year from stormwater that is used for washing machines, to flush toilets, and in parks and gardens.

In the Western Sydney Aerotropolis area, Sydney Water has been appointed as the trunk drainage authority responsible for delivering and maintaining the regional stormwater network. The network adopts an integrated water cycle management where stormwater flows into natural water channels and wetlands instead of traditional concrete pipes. This method helps in harvesting, treating, and reusing stormwater as recycled water for irrigation and other purposes. The goal is to create a cooler, greener, and more sustainable urban environment

#### Case study: Stormwater harvesting and treatment in Orange

The city of Orange in the Central West of NSW is home to 40,000 people. In the first decade of this century the region faced continued dry condition. Its long-term rainfall was declining, and dams fell to 23% in 2010. After years of water restrictions, the community encouraged Orange City Council to do something fast to provide more water.

Council and government agencies, in particular NSW Health, worked together to create an award-winning scheme. With wastewater already being used as part of a recycling scheme for a nearby gold mine, they looked to stormwater harvesting recycling as a solution. This scheme can provide up to 25% of the town's drinking water supply.

The proposal to recycle stormwater into the drinking water supply dam was initially considered brave. Community resistance to drinking recycled stormwater was initially thought of as a significant challenge. However, acceptance was achieved relatively quickly through engagement that focused on the need for increased water security and education about the treatment technology. The campaign included local and national media coverage, community information sessions, tours, on-line surveys, and explanatory signage at key locations. Developing the regulatory regime and engaging with the community took time but the result is an award-winning scheme supported by the community.

Many stormwater harvesting and treatment schemes are small scale and operated by councils. While there is no centralised data collection, collectively these schemes contribute drinking to water savings while providing localised benefits for flood mitigation and increased green spaces.

#### Engaging with the community on recycled water

We recognise that securing public support is key to ensuring that recycled water options can be considered in future supply plans. Engaging early and understanding challenges and opportunities means safe supply options can be considered when needed, whether to respond to drought or to address increasing demand from growing populations.

Community support and increasing water literacy is particularly important for the success of purified recycled water for drinking. Sydney Water and Hunter Water have comprehensive customer engagement programs that increase water literacy and community awareness of the need to diversify water sources. In the consultation for the <a href="Lower Hunter Water Security Plan">Lower Hunter Water Security Plan</a>, 77% of focus group participants were open to considering purified recycled water for drinking. This demonstrates that communities support considering purified recycled water alongside other rainfall-independent water supply options such as desalination.

Education and engagement for recycled water has evolved significantly over recent decades, with Perth and many cities in the USA and around the world achieving community acceptance for purified recycled water.

The Water Services Association of Australia has completed a study on community engagement for purified recycled water. Their published report, 'All options on the table - Lessons from the journeys of others', provides insights on the importance of doing community engagement and doing it well. The report identifies several key components for engagement on recycled water:

- champions and visionaries to drive the project
- early engagement with regulators to overcome technical challenges and ensure drinking water guidelines will be met
- extensive engagement with government and the community throughout the planning, delivery, and operational stages
- learning from the journeys of other proponents in similar geographic locations
- understanding the specific catchment context.

The need for purified recycled water demonstration facilities to support engagement with the community was identified in both the Greater Sydney Water Strategy and the <u>Lower Hunter Water Security Plan</u>. It was also identified in some regional water strategies, including the Macquarie-Castlereagh Regional Water Strategy. As well as increasing water literacy, these facilities offer a critical step for engagement and demonstrate commitment to looking at all options for water services in our urban centres.

Community engagement for the <u>NSW Water Strategy</u> and the 12 regional water strategies has shown that there is broad support for recycled water, including purified recycled water for drinking. Regional communities in particular have expressed support for investing in recycled water to reduce

reliance on traditional water supply options and improve water security. For example, community feedback on the <u>Namoi Regional Water Strategy</u> found very strong support for recycled water, with stakeholders arguing that water savings and reduced reliance on regulated storage supply systems might be beneficial. Stakeholders also supported recycled water investment as a viable option for reducing waste and pollution from wastewater treatment plants.

Some regional utilities like Tamworth Regional Council, Orange City Council and Rous County Council are engaging with regulators, water planners and communities on how purified recycled water could contribute to their water security and support growing industries. These projects are identified in the Government's regional water strategies. The NSW and Commonwealth governments have also funded detailed business cases for the Tamworth advanced water treatment plant and a demonstration PRW plant for Orange City Council to be used as a training facility. Central Coast Water is also investigating purified recycled water in long-term planning.

#### Case study - Discovery Centre to build customer awareness and trust

With the aim of building customer awareness and trust in purified recycled water technology, Sydney Water opened its Purified Recycled Water Discovery Centre at Quakers Hill in 2023. In the year since opening, over 2,250 people have already visited the Centre (correct as at October 2024). The Centre enables the community the opportunity to see how the treatment technology works, understand the range of benefits and build trust in the process that produces water that is safe to add to our drinking water supplies.

Visitor centres and demonstration plants of this kind have an important role in community awareness and acceptance of purified recycled water for drinking.



Figure 7 The Quakers Hill Purified Recycled Water Discovery Centre in Sydney (Courtesy of Sydney Water)

#### Regulating recycled water

The role of the NSW Government is to facilitate delivery of recycled water and to provide regulation, licensing and approvals that support the delivery of safe water to customers. The planning and delivery of projects will most often be led by a specific proponent, whether it be a state-owned corporation, local water utility, private utility, council or a business.

The regulation of recycled water projects is currently complicated, with no single NSW Government department or regulator having full responsibility or oversight for the process. Several agencies have a regulatory function related to recycled water, including the NSW Department of Climate Change, Energy, the Environment and Water, NSW Health, the Independent Pricing and Regulatory Tribunal, the Department of Planning, Housing and Infrastructure, and the Environment Protection Authority. The role and function of each agency is based on applicable legislation and reflects varied responsibilities, such as public health, waterway health, urban planning and so on (refer Appendix 1. NSW legislation relating to recycled water).

Specific licensing and approval requirements for water recycling vary for state-owned corporations, local water utilities, metropolitan councils and private water utilities (licensed under the *Water Industry Competition Act 2006*).

NSW state-owned corporations do not require a specific approval to produce recycled water, however their operating licence requires them to maintain a management system consistent with <u>Australian Guidelines for Water Recycling</u>, and NSW Health may also specify additional requirements. Their responsibilities under their operating licence are audited by the Independent Pricing and Regulatory Tribunal (IPART).

Licensing and approvals requirements for other utilities are regulated under various legislation depending on the type of proponent and the type of recycled water scheme.

Legislative responsibilities for state-owned corporations, local water utilities, metropolitan councils and private water utilities are summarised in *Appendix 2. Legislative arrangements for provision of NSW water services*.

The complex regulatory environment, with differing legislation, government agency roles, compliance and reporting regimes, and applicable licensing and approvals requirements poses challenges for recycled water projects. Some proponents have argued that the complex process should be improved, and approvals be more centralised and coordinated to better recognise the integrated nature of alternative and contemporary water supply solutions.

Table 4 Summary of key role of government agencies and proponents in recycled water

| Agency                                                              | Role                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSW Department of Climate Change, Energy, the Environment and Water | <ul> <li>Ensure utilities provide safe and secure, water and wastewater services</li> <li>Manage ground water and surface water resources</li> <li>Issue water licences and approvals for some users/purposes</li> <li>Develop and oversee water laws, policies, strategies and water-sharing plans</li> <li>Approve water and sewerage works, review higher risk discharges</li> </ul> |
| NSW Health                                                          | <ul> <li>Protect public health and regulate drinking water suppliers for quality</li> <li>Provide guidance and advice to manage water quality risks</li> <li>Regulate drinking water management systems of suppliers</li> <li>Monitor cases of infectious disease, outbreaks &amp; causes</li> </ul>                                                                                    |

| Agency                                                 | Role                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSW Department of Planning, Housing and Infrastructure | <ul> <li>Assess large, state-significant projects such as some recycled water schemes</li> <li>Evaluate infrastructure priorities, and balance protecting environmental assets with industry and community needs</li> </ul>                                                                                                                                                                          |
| NSW<br>Environment<br>Protection<br>Authority          | <ul> <li>Protect the environment and human health through regulation of wastewater services provided by water utilities, including discharge licensing</li> <li>Primary regulator when recycled water is reused on land, via the NSW resource recovery framework (for example the reuse of stormwater and effluent (wastewater) and the use of waste to energy (Energy from Waste Policy)</li> </ul> |
| Independent<br>Pricing and<br>Regulatory<br>Tribunal   | <ul> <li>Sets the maximum prices that monopoly services such as declared water utilities like Sydney Water, Hunter Water, etc can charge for water, recycled water and sewerage services.</li> <li>Administer the operating licences of Sydney Water, WaterNSW and Hunter Water</li> <li>Administer the licensing of private water utilities</li> </ul>                                              |
| Infrastructure<br>NSW                                  | Ensure coordinated and efficient approach to infrastructure delivery including integrated water management in priority growth areas eg Western Sydney                                                                                                                                                                                                                                                |
| Local water utilities                                  | <ul> <li>Deliver safe, secure, efficient, sustainable, and affordable water supply and wastewater services in regional NSW</li> <li>Most operated by local government or county councils</li> </ul>                                                                                                                                                                                                  |
| State-owned corporations                               | <ul> <li>Sydney Water and Hunter Water provide water and wastewater services in major urban areas</li> <li>WaterNSW manages bulk water supply in NSW and drinking water catchment for Greater Sydney</li> </ul>                                                                                                                                                                                      |
| Private utilities                                      | Private water utilities licensed under the Water Industry Competition Act 2006 that provide water services to customers                                                                                                                                                                                                                                                                              |
| Local councils                                         | <ul> <li>Manage most stormwater infrastructure</li> <li>Some councils harvest and treat stormwater for use on parks and ovals</li> <li>Approve some private recycled water systems under <i>Local Government Act</i></li> </ul>                                                                                                                                                                      |

#### Our broader work to support water recycling

Work is underway to encourage and expand water recycling across NSW, with the <u>NSW Water Strategy</u>, regional water strategies and the metropolitan water strategies identifying initiatives to drive diversification of water resources. Beyond this, State owned, local and private water utilities and councils are developing localised projects to deliver recycled water for irrigation of parks, agriculture, industry, and household non-drinking uses.

While this Roadmap identifies how we address regulatory barriers and improve government facilitation, it is complemented by related but distinct areas of work that also support recycled water delivery. These associated projects are challenging areas of policy work that we are committed to delivering to support our vision for recycled water in the longer term.

#### Investigating stormwater harvesting options

## NSW Water Strategy Action 6.7 – Proactive support for water utilities to diversify sources of water

Innovative examples of stormwater harvesting are in place across NSW including in Orange (discussed below), Sydney and Newcastle. In highly urbanised environments, there are benefits to the capture and reuse of stormwater to manage flooding and wet weather issues. Capture and reuse of this water can provide urban amenity benefits for maintaining green open space or for other potable or non-potable uses.

The <u>NSW Water Strategy</u> recognises that there are several issues to be examined and resolved regarding the regulation and governance of stormwater harvesting. These include the relationship to water sharing plans, and how water that might otherwise flow into our river systems and provide a downstream benefit can best be accounted for and managed. We are currently working to clarify these regulatory arrangements and to develop a framework for stormwater harvesting that will make it easier to implement appropriate options.

#### Investigating groundwater recharge activities

#### NSW Water Strategy Action 6.8 - Investigate and enable managed aquifer recharge

Using existing aquifers for storage of recycled water could provide an important solution and a valuable drought response. Schemes of this type and at a range of scales are already in place globally and in Perth. However, for this to take place in NSW we need an established policy for managed aquifer recharge and an associated regulatory framework.

This work is in its early stages as an action of the <u>NSW Water Strategy</u> and the <u>NSW Groundwater</u> <u>Strategy</u>. It will include:

- ensuring a fair distribution of the benefits between users
- understanding the impact of increased storage being available within the current water management frameworks
- assessing the impacts on surface and ground water quality, connectivity, and the environment – including impacts to groundwater-dependent ecosystems

#### Improving the integration of land use and water management

## NSW Water Strategy Action 4.4 – Better integrate land use planning and water management

Work has been undertaken to understand opportunities to improve and align land use and water planning, in particular to:

- understand links and gaps between land use planning and water management
- ensure that policy, legislation, regulation and advisory functions pertain to development impacts on water catchments
- create an environment where key land use decisions are supported by water information

support water-related climate and ecosystem resilience through the planning system Using information from consultation and a review of existing policy and planning pathways, the project has identified areas of reform in land use planning, water resource planning, water utility planning, and coastal and marine estate management. Work is now underway to progress these reforms.

### The barriers to overcome

To develop the Recycled Water Roadmap, we completed work to understand the perceived barriers to recycled water. This included reviewing the literature, workshops and targeted discussions with public and private water utilities, property development companies, water and local government peak bodies, universities, and NSW Government agencies. The Independent Metropolitan Water Advisory Panel (now the Independent Water Advisory Panel) also provided valuable feedback.

Through consultation we identified the key barriers to recycling for drinking and non-drinking end uses. We then used this feedback to inform development of the actions in this Roadmap. Table 5 below summarises the key barriers identified during consultation.

Table 5 Summary of the key barriers to water recycling identified during Phase 1 of the Recycled Water Roadmap project

| Barrier<br>categories     | Barrier                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community<br>acceptance   | <ul> <li>Lack of community understanding and acceptance of recycled water and purified recycled water.</li> <li>Ambiguous policy context and lack of Government direction for purified recycled water.</li> <li>Access to unbiased, reliable sources of information.</li> </ul>                                                                                                                                                        |
| Governance and regulation | <ul> <li>Limited knowledge of regulatory requirements and approval processes.</li> <li>Regulatory requirements and processes are too complex and onerous, especially for small schemes.</li> <li>Fragmented responsibilities, lack of regulatory coordination, inconsistent advice among government regulators for non-potable reuse schemes.</li> <li>Outdated technical guidelines, inconsistent regulatory requirements.</li> </ul> |
| Economic and pricing      | <ul> <li>Need for improved IPART guidance that captures broader benefits and avoided or avoidable costs of recycled water and integrated water cycle management.</li> <li>Lack of clarity on level of detail required for customer willingness-to-pay studies and customer benefits.</li> <li>No flexibility to assess recycled water projects outside the price review process to support timely commercial decisions.</li> </ul>     |
| Investment risks          | <ul> <li>Difficulty in securing recycled water customers due to demand uncertainty and pricing.</li> <li>Absence of standard guidelines and templates for business cases and cost-benefit assessments for recycled water.</li> </ul>                                                                                                                                                                                                   |

| Barrier categories                                                 | Barrier                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Skills and capabilities                                            | <ul> <li>Limited skills in advanced treatment and recycling as well as planning, risk assessment, procurement, project management and operations in some regional utilities.</li> <li>Very limited training available in the operation and maintenance of advanced treatment and recycling systems</li> </ul>                                                                                                                                                                                                                                                                                       |
| Integrated water cycle management and integrated land-use planning | <ul> <li>Fragmented responsibilities across the water cycle.</li> <li>Lack of resources to develop precinct-level plans with embedded integrated water cycle management.</li> <li>Little to no opportunity for recycled water providers other than State-Owned Corporations to be involved in planning at early stages.</li> <li>BASIX as a broad policy mechanism focusing on lot scale solutions is not driving recycled water options.</li> <li>Current State Environmental Planning Policies (SEPPs) are not effective instruments for implementation of non-potable recycled water.</li> </ul> |
| Environmental<br>challenges                                        | <ul> <li>Potential impacts on reduced river flows, water quality in rivers and estuaries</li> <li>Disposal of brine and storage of salt and other waste products</li> <li>Emerging contaminants in wastewater.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                           |

## Our roadmap for the future

The Recycled Water Roadmap will make it easier for water utilities to assess, cost, engage with their customers on recycled water, and invest in it for both drinking and non-drinking purposes. The Roadmap will support utilities to consider recycled water equally with other supply and demand options. It will also smooth the pathways of regulation, licensing and approvals to streamline the process, while maintaining a focus on public health.

The actions in the Recycled Water Roadmap will be led by the NSW Department of Climate Change, Energy, the Environment and Water in collaboration with NSW Health, IPART and the NSW Environment Protection Authority (EPA). Together we aim to progress key areas of work, focusing on policy, economics, regulation, and co-ordination to enable increased delivery of recycled water.

The Recycled Water Roadmap focusses on actions that we plan to deliver over the next 2 years. However, we recognise that some of this work is foundational in nature and while it sets us in the right direction, there will be more to come. We will monitor progress of implementation so that we can identify new opportunities over the coming 5 years.

# Priority 1: We need state-wide planning and policy frameworks in place that support integrated and coordinated planning for recycled water

For cities and towns to have recycled water and integrated water management solutions in place, water and growth planning must be integrated and appropriate policies and planning frameworks must be in place.

The NSW Government has housing targets across both metropolitan and regional areas to help meet the NSW need for 377,000 new homes across NSW by 2029. We acknowledge that water infrastructure planning requires a long lead time. Water servicing for new developments must be addressed as early as possible in the planning process so that drinking water, recycled water and wastewater options are appropriately planned, designed and costed. Options for servicing by either public or private water utilities should also be considered up front in this process.

Improvements to the NSW planning framework and greater coordination across government agencies will enable integrated water cycle solutions to water management to be embedded at the early stages of urban planning. As part of this approach, developers should be encouraged to consider the use of recycled water. This will support on-ground delivery of cost-effective recycled water schemes, including for urban greening and cooling household uses and to support industry and the circular economy.

Cross-government collaboration is key to moving towards integration (see Action 3.1). The NSW Government's better integrating land use and water planning project has identified opportunities to improve collaboration including by using existing platforms like Urban Development Forums and by considering water in Place-Based Strategies. Specific mechanisms to support cross-government collaboration at the strategic and regional planning stages will evolve as the integration of water service planning and land use planning proceeds.

Actions under priority 1 are intended to maximise opportunities for developments to leverage recycled water to support development. Implementation of these actions will be supported by cost benefit analysis, where appropriate.

Table 6 Actions for priority 1.

| Number | Action                                                                                                                                                                                                                                        | Responsibility                                                                                                                           | Timeframe              |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1.1    | Review and implement opportunities for early consideration of recycled water at the strategic planning stage, and opportunities for increased consultation with water utilities and councils to ensure recycled water options are considered. | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water<br>Department of Planning,<br>Housing and<br>Infrastructure | May 25 –<br>October 26 |

| Number | Action                                                                                                                                                                        | Responsibility                                                               | Timeframe                   |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------|
| 1.2    | Review BASIX, and evaluate potential changes to the Sustainable Buildings State Environmental Planning Policy.                                                                | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water | Ongoing                     |
|        |                                                                                                                                                                               | Department of Planning,<br>Housing and<br>Infrastructure                     |                             |
| 1.3    | Review the effectiveness of Water<br>Recycling Schemes to confirm whether<br>they are correctly accounted for in BASIX<br>water saving assumptions.                           | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water | January 26 –<br>December 26 |
|        |                                                                                                                                                                               | Department of Planning,<br>Housing and<br>Infrastructure                     |                             |
| 1.4    | Investigate potential incentive programs to increase use of cost-effective recycled water (for example, credits schemes and funding programs).                                | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water | October 25 –<br>July 26     |
| 1.5    | Engage in the renewal of the National Water Initiative and develop a NSW Action Plan that captures the need for resilient water systems and the importance of recycled water. | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water | April 25 –<br>November 26   |

## Priority 2: We need to provide tools and resources to support planning and delivery of recycled water solutions

Utilities need to consider all options for water security, including water recycling, in their strategic water planning. Utilities across NSW will need to be able to evaluate and assess the potential for recycled water solutions alongside traditional solutions like surface water, groundwater and desalination. We recognise that information and guidance materials are needed to assess and evaluate potable and non-potable solutions. A range of strategic and technical guidance, tools, and processes can assist utilities in planning, investing, managing risks, and engaging with the community on recycled water.

We recognise that the economic assessment of recycled water projects may be a new and more complex area of work for a utility, compared with conventional water supply projects. We will provide resources to support utilities to assess the investment risk, opportunities and methods to value increased water supply resilience, and to develop strong, evidence-based business cases that meet government expectations.

Table 7 Actions for priority 2.

| Number | Action                                                                                                                                                                                                                                    | Responsibility                                                                                    | Timeframe              |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------|
| 2.1    | Update the current NSW Guideline-<br>Recycled Water Management Systems to<br>align with the Local Water Utility<br>Regulatory and Assurance Framework and<br>to include a broader range of end uses,<br>including purified recycled water | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water                      | May 25 – May<br>26     |
| 2.2    | Develop a water recycling cost-benefit guideline and catalogue of values to provide guidance and consistency in approach to economic analysis for water recycling                                                                         | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water<br>IPART<br>Treasury | April 25 –<br>March 26 |

# Priority 3: We need clear regulatory and approvals processes in place for recycled water and engagement with stakeholders

Increased water recycling requires that regulatory and approvals processes support proponents through all stages of the project lifecycle. Regulations and approvals need to be fit-for-purpose, so that the level of complexity is commensurate with the risk. They also need to be applied fairly and consistently so that all proponents have the same requirements for approvals and risk assessment.

We recognise that regulatory requirements are not currently uniform across legislation for recycled water and that we could improve service to all proponents, water utilities and local councils with clear, transparent, fair and efficient processes. We also need to provide better information about the role and responsibilities of government agencies relating to recycled water and we need to improve and streamline our assessment and approvals processes.

Table 8 Actions for priority 3.

| Number | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Responsibility                                                                             | Timeframe             |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------|
| 3.1    | <ul> <li>Establish DCCEEW as the lead coordination agency for water recycling by:</li> <li>establishing a Recycled Water Coordination Committee within the NSW Government to align processes and provide coordinated assessment and approval of recycled water projects. The committee will engage with key stakeholders</li> <li>creating a concierge function within DCCEEW to provide a central point of contact to proponents for regulatory advice and guidance to plan and deliver recycled water.</li> <li>Providing online information about NSW Government roles and responsibilities for recycled water planning, regulation and approvals.</li> </ul> | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water               | April 25 –<br>Dec 26  |
| 3.2    | Investigate options to reform the current<br>Regulatory and Assurance Framework (RAF) for<br>local water utilities to address and capably<br>manage risks of water recycling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water<br>NSW Health | April 25 –<br>June 26 |

#### Priority 4: We need to build capacity and capability across the water sector to plan and deliver innovative recycled water solutions

Recycled water schemes are highly varied, from precinct-based or decentralised reuse schemes, to decentralised third-pipe schemes, to purified recycled water plants. Expanded water recycling requires an understanding of the complexities and risks as well as the appropriate skill set to strategically plan, deliver and safely operate a scheme. By expanding resources, offering greater advice and training, facilitating information sharing and researching innovative solutions, we can build capability and capacity across the water sector, for regional utilities and local governments, to support emerging water intensive industries and the circular economy

We recognise that capacity and capability of water utilities to deliver recycled water varies across the state based on factors including size, urban density and remoteness. Our actions to increase capability and capacity will be focussed on the needs of the utility and the communities they serve. We will integrate our work with the Town Water Risk Reduction Program, which supports local water utilities to reduce risks, address critical skills shortages and boost water operations training and employment in regional NSW.

We will work with the Environment Protection Agency which has expertise in resource recovery and can apply resource recovery orders to incentivise innovation and the circular economy.

Table 9 Actions for Priority 4.

| Number | Action                                                                                                                                                                                                                                                                             | Responsibility                                                                                                                | Timeframe                        |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 4.1    | Provide online educational resources to support utilities in engaging with their community and decision makers on recycled water options as part of their planning process, including sources, treatment processes, and risks.                                                     | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water<br>NSW Health (as a key<br>consultation partner) | April 2025 –<br>December<br>2026 |
| 4.2    | Engage with utilities, local government, industry and research agencies to address technical issues, plan for and respond to emerging contaminants, and understand the future potential for recycled water, including for the circular economy and to support emerging industries. | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water                                                  | April 2025 –<br>December<br>2026 |
| 4.3    | Set and educate local water utilities expectations for effective, evidence-based strategic planning, including on water security. Provide guidance and support on approaches to consider options and implementing sound strategic decisions on water security                      | NSW Department of<br>Climate Change, Energy,<br>the Environment and<br>Water                                                  | April 2025 –<br>December<br>2026 |

# Priority 5: We need to take steps now so that purified recycled water is an option for our future drinking water supply

Purified recycled water can provide critical rainfall independent water supply and deliver environmental benefits. Government has an important role in leading the conversation about purified recycled water as a source of drinking water and in working with water utilities to communicate, educate, engage and build trust with their customers.

We see purified recycled water as a part of the future and recognise the importance of validating the process, demonstrating the technology, and communicating the benefits now.

Table 10 Actions for priority 5.

| Number | Action                                                                                                                                                                                                                               | Responsibility                                                            | Timeframe                        |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------|
| 5.1    | Develop a framework to support state-owned corporations and local water utilities to deliver community engagement and social research programs for purified recycled water.                                                          | NSW Department of<br>Climate Change, Energy,<br>the Environment and Water | April 2025 –<br>December<br>2025 |
| 5.2    | Recommend a review of the <u>Australian</u> <u>Guidelines for Water Recycling</u> to the Australian Government, to better integrate purified recycled water for drinking to align with <u>Australian Drinking Water Guidelines</u> . | NSW Department of<br>Climate Change, Energy,<br>the Environment and Water | April 2025 –<br>December<br>2026 |

## Appendix 1. NSW legislation relating to recycled water

Table 11 Summary of NSW legislation related to recycled water

| Legislation                                                                                                                                                               | Application to recycled water                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul> <li>Protection of Environment Operations Act 1997</li> <li>Environment Protection Authority OR</li> <li>appropriate reg. authority (EPA or local council)</li> </ul> | Applicable to all. EPA is the regulator if activity is required to have an environment protection licence (EPL) because it is listed under Schedule 1 or if it is likely to pollute water, or if the activity is carried out by a public authority. Local government is the regulator if activity does not meet these criteria. The Act provides for the granting of resource recovery orders that permit the reuse of waste (including stormwater and effluent). |
| Protection of the Environment Operations (Waste) Regulation 2014 • Environment Protection Authority                                                                       | The Regulation provides for the granting of exemptions from regulatory requirements for the application of waste (including stormwater and effluent) to land in NSW                                                                                                                                                                                                                                                                                               |
| <ul> <li>Marine Estate Management Act 2014</li> <li>NSW Department of Primary Industries and<br/>Regional Development and DCCEEW</li> </ul>                               | The MEM Act includes efforts to maintain and improve water quality under the NSW Marine Estate Management Strategy 2018-2028 and includes provisions to establish and protect marine parks and aquatic reserve.                                                                                                                                                                                                                                                   |
| Water Management Act 2000 / Water Act 1912  • DCCEEW- Water                                                                                                               | To extract water from a river, lake, other surface water source, or an aquifer, either a Water Act 1912 licence or a WM Act water access licence is required. The WM Act provisions that apply to water extraction generally apply to stormwater harvesting, however landholders (urban and rural) are entitled to harvest a proportion of rainwater run-off from their landholding under the Harvestable Rights Order without the need for a licence.            |
| <ul> <li>Environmental Planning and Assessment Act 1979</li> <li>DPHI</li> <li>Local councils</li> </ul>                                                                  | Applicable to all. Development may be scheduled as State Significant Development (SSD), State Significant Infrastructure (SSI) or designated development under Part 4 of EP&A Act. On prescribed land, the Transport Infrastructure SEPP may override approval under Part 4 of the EP&A Act.                                                                                                                                                                      |

| Legislation                                                    | Application to recycled water                                                                                                                                                                                                                         |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Local Government Act 1993 and the Water<br>Management Act 2000 | Under Section 60 of the <i>Local Government Act 1993</i> and Section 292(1)(a) of the <i>Water Management Act 2000</i> , the Minister is responsible for approving local water utility works. This includes:                                          |
| DCCEEW- Water                                                  | construction or extension of water treatment works by a council                                                                                                                                                                                       |
|                                                                | provision of sewage from its area to be discharged, treated, or supplied to any person by a council                                                                                                                                                   |
|                                                                | construction, maintenance, and operation of water management works and other associated works (including water treatment works and sewage works)                                                                                                      |
| Public Health Act 2010  NSW Health                             | The <i>Public Health Act 2010</i> requires all drinking water suppliers to implement a quality assurance plan. NSW Health has general powers to issue orders and direct suppliers of water (including recycled water) to prevent public health risks. |
| Sydney Water and Hunter Water Operating<br>Licences            | Utility is required to have a drinking water management system consistent with the Australian Drinking Water Guidelines and a recycled water management system consistent with the Australian Guidelines for Water                                    |
| NSW Health                                                     | Recycling. NSW Health may specify additional requirements, and the management systems must be implemented to the satisfaction of NSW Health.                                                                                                          |
| Water Industry Competition Act 2006                            | WIC Act sets up a licensing system for private water utilities that allows them to operate in NSW and ensures                                                                                                                                         |
| • IPART                                                        | that they do so in a way that protects public health and safety, consumers and the environment.                                                                                                                                                       |

### Appendix 2. Legislative arrangements for provision of NSW water services

Table 12 Summary of NSW legislative arrangements for State-owned corporations, Sydney Water and Hunter Water for water servicing. L is for licence

| Legislation, regulating agency notes/ exceptions        | Recycled<br>wastewater | Harvested and<br>treated<br>stormwater | Sewerage<br>services | Drinking water |
|---------------------------------------------------------|------------------------|----------------------------------------|----------------------|----------------|
| Sydney Water Act 1994, Hunter Water Act 1991<br>- IPART | L                      | L                                      | L                    | L              |
| Pricing review and regulation  IPART                    | <b>√</b>               | ✓                                      | ✓                    | <b>√</b>       |
| Public Health Act 2010 - NSW Health                     |                        |                                        |                      | <b>√</b>       |

Table 13 Summary of NSW legislative arrangements for private water service providers. L is for licence and A for approval

| Legislation regulating agency notes/ exceptions                                                                                      | Recycled<br>wastewater | Harvested and<br>treated<br>stormwater | Sewerage<br>services | Drinking water |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------|----------------------|----------------|
| Local Government Act 1993 (section 68) -Local Councils -for wastewater treatment systems that service less than 30 customer premises | А                      |                                        | А                    |                |

| Legislation regulating agency notes/ exceptions                                                                                                                                                                                                                                                                       | Recycled<br>wastewater | Harvested and<br>treated<br>stormwater | Sewerage<br>services | Drinking water |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------|----------------------|----------------|
| <ul> <li>Water Industry Competition Act 2006         <ul> <li>IPART</li> <li>mandatory referral to DCCEEW, NSW Health, EPA, local councils</li> </ul> </li> <li>separate licences are required for operational and retail functions         <ul> <li>approvals are required for infrastructure</li> </ul> </li> </ul> | L and A                | Land A                                 | Land A               | L and A        |
| Pricing review and regulation - IPART - private utilities only regulated if they are declared a monopoly under WIC Act                                                                                                                                                                                                | ✓                      | ✓                                      | ✓                    | <b>✓</b>       |
| Public Health Act 2010 - NSW Health                                                                                                                                                                                                                                                                                   |                        |                                        |                      | ✓              |

Table 14 Summary of NSW legislative arrangements for local water utilities. A is for approval

| Legislation regulating agency notes/ exceptions                                                                                                                                                                                                                 | Recycled<br>wastewater | Harvested and<br>treated<br>stormwater | Sewerage<br>services | Drinking water |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------|----------------------|----------------|
| <ul> <li>Local Government Act 1993 (section. 60)</li> <li>DCCEEW         referral to NSW Health and EPA</li> <li>an approval for harvested and treated stormwater is only required if only if the water is used to supplement drinking water supply)</li> </ul> | А                      |                                        | А                    | A              |
| Water Management Act 2000 (section 292)  DCCEEW  consultation with Health and EPA  an approval for harvested and treated stormwater is only required if only if the water is used to supplement drinking water supply)                                          | А                      |                                        | А                    | А              |
| Pricing review and regulation for local water utilities only if declared a government monopoly under the IPART Act - IPART                                                                                                                                      | ✓                      | <b>√</b>                               | <b>✓</b>             | <b>√</b>       |
| Public Health Act 2010 - NSW Health                                                                                                                                                                                                                             |                        |                                        |                      | ✓              |

Table 15 Summary of NSW legislative arrangements for metropolitan councils water servicing. L A for approval

| Legislation regulating agency notes/ exceptions                                                                                   | Recycled<br>wastewater | Harvested and<br>treated<br>stormwater | Sewerage<br>services | Drinking water |
|-----------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------|----------------------|----------------|
| Water Industry Competition Act 2006  - licences are required for operational function - approvals are required for infrastructure | L and A                | L and A                                | L and A              | L and A        |
| - IPART<br>- mandatory referral to DCCEEW, NSW Health, EPA, local councils                                                        |                        |                                        |                      |                |