FIVE YEAR WATER CONSERVATION PLAN

November 2024

Acknowledgement of Country

Hunter Water acknowledges the Traditional Countries of the Awabakal, Geawegal, Darkinjung, Wonnarua and Worimi peoples on which we operate and the Countries beyond where our water flows.

We recognise and respect the cultural heritage, beliefs and continuing connection to the lands and waters of our Traditional Custodians and pay respect to their Elders past, present and emerging.

Mariin Kaling - All for Water

Saretta Fielding

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EXECUTIVE SUMMARY

Hunter Water provides safe, reliable, high-quality drinking water to more than 630,000 people in homes and businesses across the Lower Hunter. We also provide wastewater, stormwater, trade wastewater, recycled water and raw water services.

For more than 130 years we have worked with our communities to deliver trusted services, innovating to meet the changing needs of our growing region while protecting its health for future generations. Our vision and purpose, **Water Is Life, To Create a Sustainable Water Future For All,** is described in our Corporate Strategy, Miromaliko Baato. In Gathung language, Miromaliko Baato means saving water. This is the closest way we can express 'water is life' using one of the languages of the traditional custodians on the land on which we operate.

Hunter Water is a State Owned Corporation (SOC), governed by the State Owned Corporations Act 1989 (NSW) and the Hunter Water Act 1991 (NSW). Hunter Water's Operating Licence is the key regulatory instrument that enables and requires us to provide our services. Our five-year Operating Licence came into effect on 1 July 2022 is regulated by the Independent Pricing and Regulatory Tribunal (IPART).

This Five Year Water Conservation Plan (the Plan) details the water conservation projects and activities Hunter Water carried out in 2023-24 as well as our future 5 year plan. The Plan is consistent with the NSW Government's Water Efficiency Framework and complies with the requirements in our Operating Licence.

Water conservation is an important element to managing the supply and demand balance for the Lower Hunter region. Hunter Water's approach to water conservation is informed by the Lower Hunter Water Security Plan (LHWSP), the economic level of water conservation (ELWC) and extensive customer and community engagement over the last two years to support the Hunter Water's price submission to the Independent Pricing and Regulatory Tribunal (IPART).

This Plan includes the following objectives:

1. By 2032, reduce potable water consumption to:
    a. A 17% reduction in potable water demand.
    b. Residential demand reducing to 155 L/p/d.
    c. Non-residential demand reducing by 2 GL/annum.
2. By 2030, reduce leakage in Hunter Water's system to:
    a. ≤50 L/connection/day.
3. Increase recycled water where it is economically feasible to do so.

During 2023-24, Hunter Water continued its strong focus on water conservation. Our flagship programs included a continued expansion of our districted metered areas and ongoing manual survey of the water network to detect leaks. In the non-residential sector we undertook additional water efficiency management plans and continued to deliver the find and fix leaks program. The residential sector was supported through our essential plumbing assistance program. There was an ongoing effort to reduce customer demand through our Love Water Program.

Our forward plan for water conservation builds on the above initiatives to put Hunter Water in the best possible position to meet our water conservation objectives. We will continue to improve our

knowledge and understanding of customer water use behaviour and use this to effectively target our program or works.

Meeting these objectives will be challenging and support from the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) will be required to maximise the chances of success – particularly in the areas of potable water consumption reduction and increasing recycled water. Further review of BASIX and the Recycled Water Roadmap provide opportunities to support water conservation objectives outlined in this plan.

INTRODUCTION

Hunter Water provides safe, reliable and efficient water and wastewater services to more than 630,000 people in the Lower Hunter region. We also manage the trunk stormwater channels in the Newcastle, Lake Macquarie and Cessnock local government areas.

We are governed by the State Owned Corporations Act 1989 and the Hunter Water Act 1991. The NSW Government regulates Hunter Water's operations through a number of regulatory bodies and instruments.

This Five-Year Water Conservation Plan details the water conservation projects and activities Hunter Water carried out in 2023-24 as well as our future 5 year plan. The Plan aligns with Hunter Water's Operating Licence requirements, including the NSW Government's Water Efficiency Framework released in October 2022.

Section 1 provides information on Hunter Water's overarching approach to water conservation, including how it is related to the Lower Hunter Water Security Plan (LHWSP) and the Operating Licence.

Section 2 describes the water conservation activities Hunter Water carried out during 2023-24 and provides information on the volumes of water drawn from all sources, level of leakage and consumption per person.

Section 3 sets out our proposed five-year plan for water conservation activities.

Further details of the methods used to assess water conservation options are provided in Appendix A.

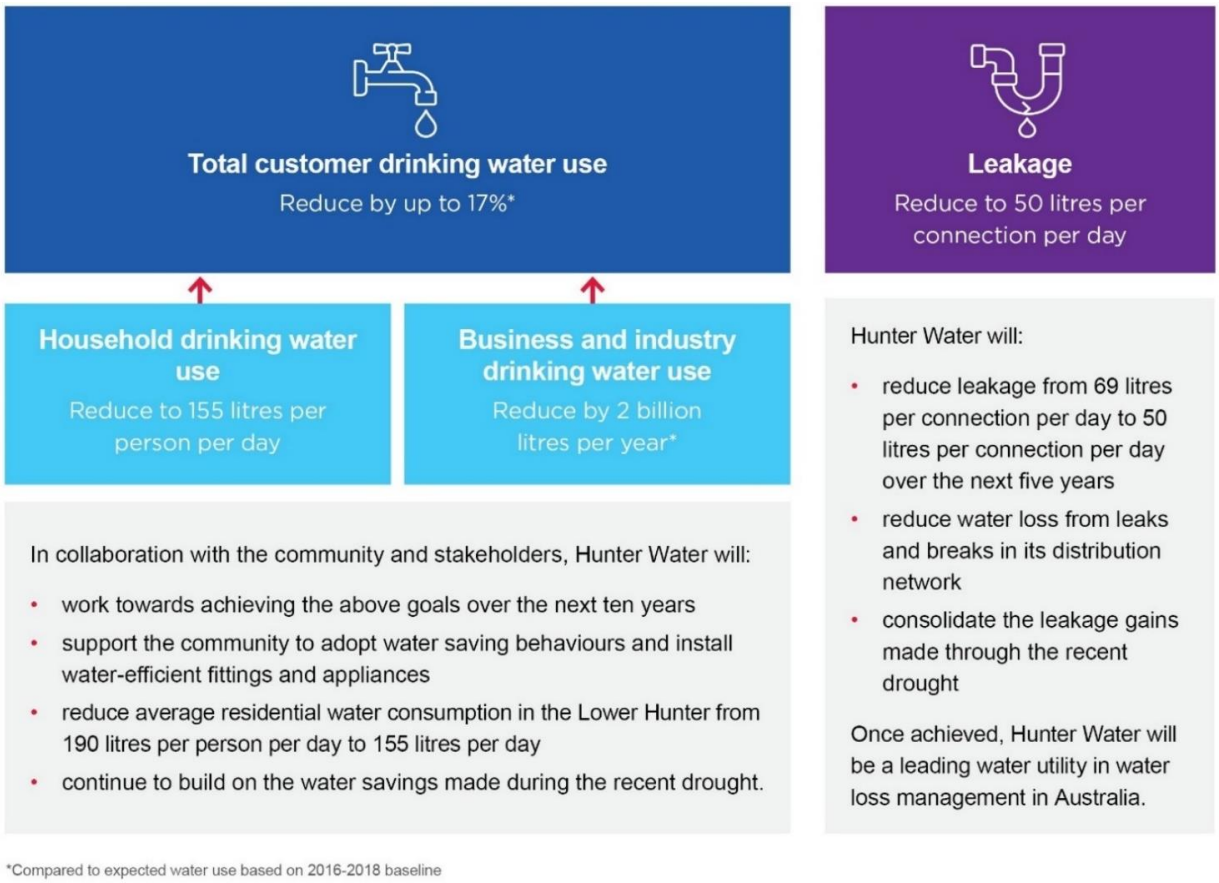
Regulatory reporting requirements are provided in Appendix B and Appendix C.

1 WATER CONSERVATION APPROACH

1.1 Lower Hunter Water Security Plan objectives

In 2022, the NSW Government released the Lower Hunter Water Security Plan (LHWSP) as a whole-of-government approach to ensuring the region has a resilient and sustainable water future.

The LHWSP sets ambitious water conservation goals for customer drinking water use and leakage and was based on the community's values and priorities at the time.



*Compared to expected water use based on 2016-2018 baseline

The LHWSP also promotes increase used of recycled water. The demand forecast included an assumption that recycled water supplied to customers would increase to 1.3 GL/year by 2032.

1.2 Operating Licence, IPART and Community Engagement

Hunter Water's Operating Licence sets the terms and conditions that specify how our services are provided, including quality and performance standards. The Operating Licence makes us accountable to the NSW Government for our performance, which is monitored by IPART. This Five-Year Water Conservation Plan is required under Clauses 12(5),12(6) and 12(7) of the 2022-27 Operating Licence.

IPART wrote to Hunter water on 19 June 2024 outlining adjustments to section 2.1.1 of the Hunter Water reporting manual. A number of recommendations were made to improve transparency of the Five Year Water Conservation Plan, including an explanation as to whether the proposed programs and / or projects furthers the licence objectives set out in clause 1(1)(b) of the Operating Licence. A copy of the letter is provided in Appendix C.

Clause 1(1)(b) of the Operating Licence refers to the objectives and the need to "set efficient and effective terms and conditions, including quality and performance standards that Hunter Water must meet when supplying or providing services" that, amongst other things, "have regard to the interests of the community in which it operates."

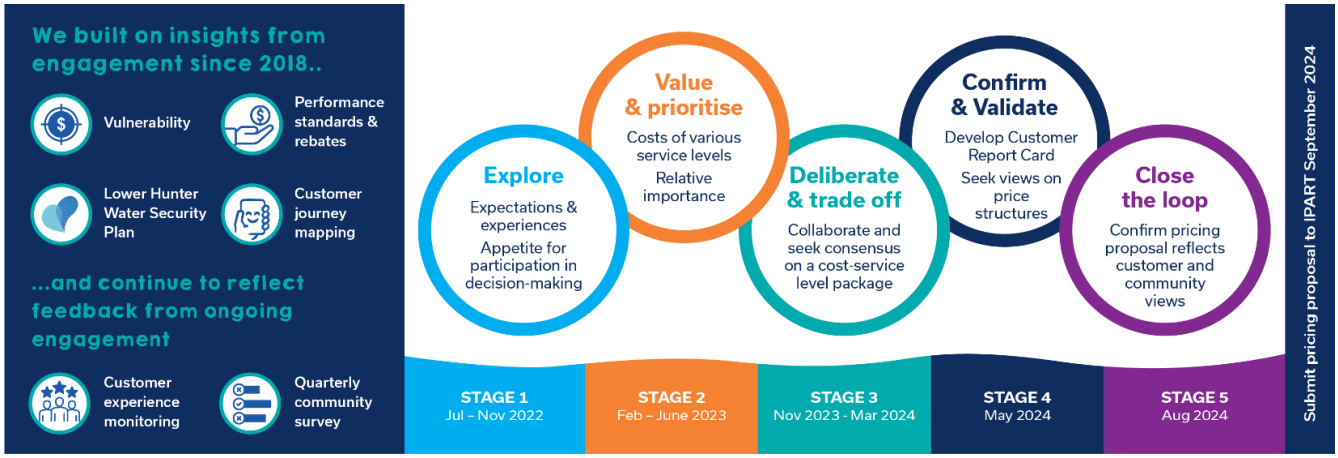
Our Community Engagement Strategy provides a framework of how we listen to our customers and community and outlines what we've heard.[1] It describes our approach to community engagement and alignment with the International Association of Public Participation (IAP2) spectrum and provides a roadmap of how we consult with our customers and community to help inform our strategic direction and future investment priorities.

Our Community Engagement Strategy is supported by our customer, consumer and community consultation procedure, which describes our regular, meaningful, unbiased and representative consultation with our customers and community.[2]

Our 'always on' approach means every interaction we have is an opportunity to listen, learn and respond. Our ongoing customer and community engagement and research includes quarterly community surveys, customer experience monitoring surveys and a participation in the Water Services Association of Australia's biennial customer perceptions survey.

In addition to insights from our regular interactions with customers and more recent targeted engagement, we have engaged extensively and in-depth with customers and our community to inform our pricing proposal, long-term corporate strategy and this 5-year Water Conservation Plan (see Figure 1-1). [3]

Figure 1-1 Our pricing proposal customer and community engagement program



We offered a range of ways to get involved over five stages, allowing people to engage in the manner that suited them best (see Figure 1-2). This approach ensured the feedback we received was unbiased by our methods of engagement.

[1] Our community engagement strategy and our customer, consumer and community consultation procedure are available on our website: https://www.hunterwater.com.au/community/community-engagement/community-engagement-strategy

[2] Our 2022-2027 Operating Licence, Section 29, requires us to articulate to our customers, consumers and community, via a procedure, our consultation methods, activities and the outcomes we intend to achieve.

[3] Further details are available on our website: https://www.hunterwater.com.au/haveyoursay/haveyoursay/2025-2030-price-proposal/pricing-proposal-stages

Figure 1-2 Our pricing proposal customer and community engagement program

In stage one, we heard from about 900 customers, community members, stakeholders, and customer representatives about the experiences they value, their concerns, and expectations. One of the top five expectations of Hunter Water related to ensuring future water security, including recycling and water conservation.[4]

In stage two, we heard from more than 5,500 customers and community members on topics chosen based on what we learned from our customers and community in stage one, and the materiality of potential bill impacts. In relation to water conservation, we sought feedback on:

- Alternative water sources for business and industry:

  Recycled wastewater schemes in the Lower Hunter provide around 6 billion litres of water per year that would otherwise need to be provided with drinking water. That's around 10% of the total water supply. We are already planning increases in recycled water and stormwater use for non-drinking purposes. This could benefit everyone by providing a climate independent water source and diversifying supply. We asked how much we should invest and who should pay

- Recycled water for community greening:

  Watering parks and sporting fields improves liveability, by promoting health and wellbeing. Switching from drinking water to recycled water or stormwater will keep these areas green, even during water restrictions. We asked what level of investment (if any) should be made to increase recycled water use for community greening and what types of areas we should prioritise.

[4] For further detail see the 2024 Pricing Proposal Engagement Stage 1 Summary Report on our website: https://hwc-web.s3-ap-southeast-2.amazonaws.com/assets/src/uploads/images/Stage-1-Engagement-Summary.pdf

- Digital/smart meters

  Digital meters can help us identify and fix leaks in our network, be read remotely and deliver an improved customer experience. We asked how quickly, if at all, we should replace mechanical meters with digital meters and if it should be on an opt-in basis for those customers who wanted them.

There were relatively clear-cut preferences for some of the topics, and mixed views for others, with no clear consensus on 'how much' we should do and 'how' the services should be delivered.[5]

We heard that digital meters were a lower priority due to the relatively high costs involved, the current economic conditions, or the benefits of adopting a more flexible approach through trials. We therefore did not carry the topic of digital meters into stage three of the engagement program.

In stage three, during November 2023 to March 2024, we convened a Community Panel (Panel) made up of a diverse and representative group of everyday people, to help us tackle our challenge:

> *Hunter Water's costs of providing water services are increasing. These higher costs will be passed on to customers through increased prices. We are also faced with some important decisions that will impact customer bills.*
>
> ***How do we balance providing reliable, high-quality services while protecting the environment, and creating a positive legacy for future generations, and keeping prices affordable?***

We provided extensive information and opportunities for in-depth, deliberative engagement spanning over five and a half days.

Our promise was to collaborate – incorporating the community's recommendations to the maximum extent possible and transparently explaining constraints where we couldn't.

The Panel was provided with information to outline the problem, including data on community attitudes from prior engagement.[6] Participants were given access to internal and external expert speakers to inform their deliberations. The sessions were observed and critiqued by independent experts throughout. Hunter Water committed to consider the Panel's recommendations to the maximum extent possible.

One of the topics deliberated was water conservation including reducing leakage, helping the community to save more water (water efficiency) and recycled water. This topic linked to our challenge of providing reliable services by making sure there is enough water for today and tomorrow.

The panel made four recommendations about water conservation. They consider conservation as crucial for securing water resources for future generations and managing water availability during periods of scarcity (e.g. drought or another emergency).

We heard that, in some circumstances, it is appropriate to pay more to save water than the water is worth (i.e. do projects that are inefficient when assessed using the ELWC methodology). The Panel preferred that we focus on fixing leaks in our system first, with improving water efficiency as the next priority. In forming this preference, the panel considered the cost-effectiveness and certainty of achieving water savings.

The Panel strongly supported leakage reduction over the other forms of water conservation as it provided greater benefit for dollars invested and it was also felt that Hunter Water had more control

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[5] For further detail see the 2024 Pricing Proposal Engagement Stage 2 Summary Report on our website: https://hwc-web.s3-ap-southeast-2.amazonaws.com/assets/src/uploads/images/Stage-2-Engagement-Summary.pdf

[6] A copy of the Engagement Report we provided to Panel members, including findings from prior research is available on our website: https://hwc-web.s3-ap-southeast-2.amazonaws.com/assets/src/uploads/images/Have-your-say/Hunter-Water-Engagement-Report-FINAL.pdf

over this than helping customers to use less water. The Panel also recommended that the broader community should not subsidise recycled water for industrial customers, however Hunter Water should continue to support recycled water schemes if it is the least cost way to do so.

We have incorporated actions to address the Panel's four recommendations on water conservation into our pricing proposal to the maximum extent possible. A full description of how we have actioned, or intend to action, each of the recommendations is available on our website.[7]

The final recommendations of the Panel, which have been incorporated into Hunter Water's pricing proposal, fund $38.1m in water conservation expenditure:

- $12.6 million to help customers use water more wisely and efficiently, and to reduce their leaks (water efficiency). This is ~$1 million in expenditure above the Economic Level of Water Conservation (ELWC).
- $25.5 million to reduce leaks from our water system. This is ~ $13 million in expenditure above the ELWC.

We estimate that the additional expenditure (above ELWC) would add $0.94 per year, every year to a typical household bill from 1 July 2025 to 30 June 2030 ($2024-25, without inflation).

The implications of the above for the 5-year Water Conservation Plans objectives are:

1. Retain the LHWSP target to reduce the potable water demand to 17%, noting the 2032 timeframe to achieve this ambitious target is at risk. We will continue to closely monitor performance and work with DCCEEW and our community to maximise performance.
2. Reduce leakage to ≤ 50 L/connection/day by 2030.
3. Increase recycled water where it is economically feasible to do so. The LHWSP target of 1.3 GL/annum by 2032 is unlikely to be met given the Community Panel's feedback on recycled water and no resulting expenditure allowance in Hunter Water's proposed Pricing Submission to IPART in September 2024.

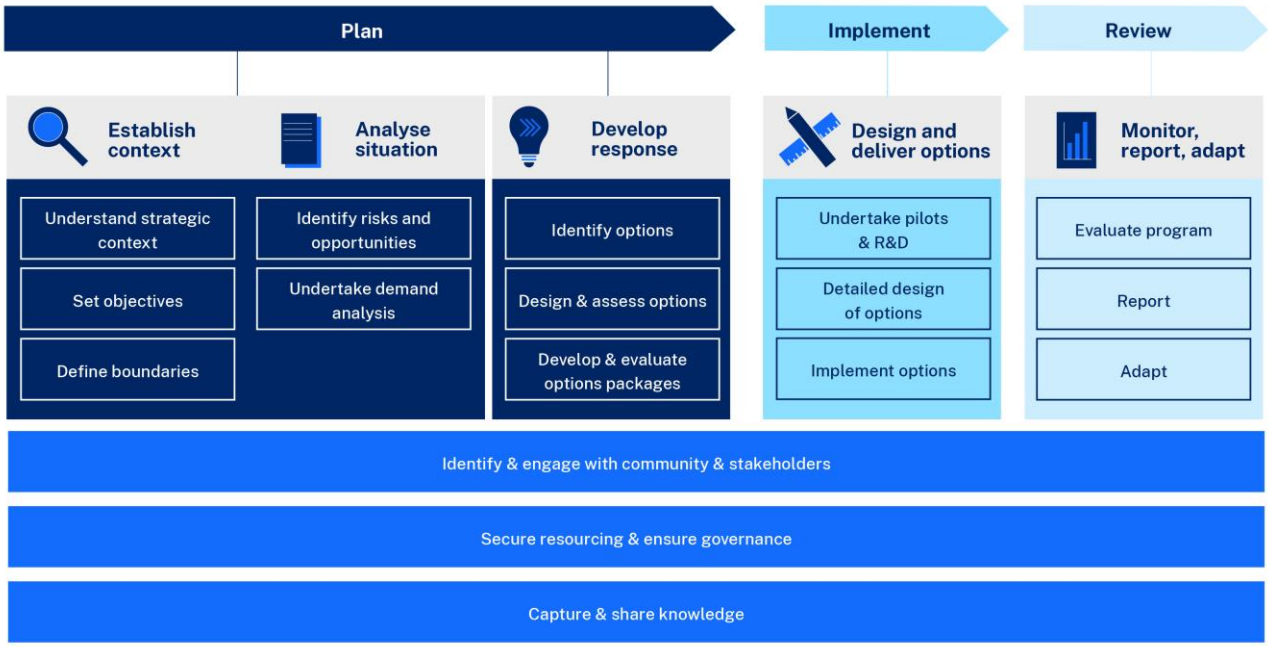
1.3 NSW Water Efficiency Framework

The Five Year Water Conservation Plan has been developed to be consistent with the Water Efficiency Framework (the Framework). The Framework has been developed by the NSW Government to support the design, delivery and review of water efficiency programs.

As part of the development of the Framework, in June 2022 Hunter Water's approach to water conservation was assessed and found to "perform well against the (draft) NSW Water Efficiency Framework."

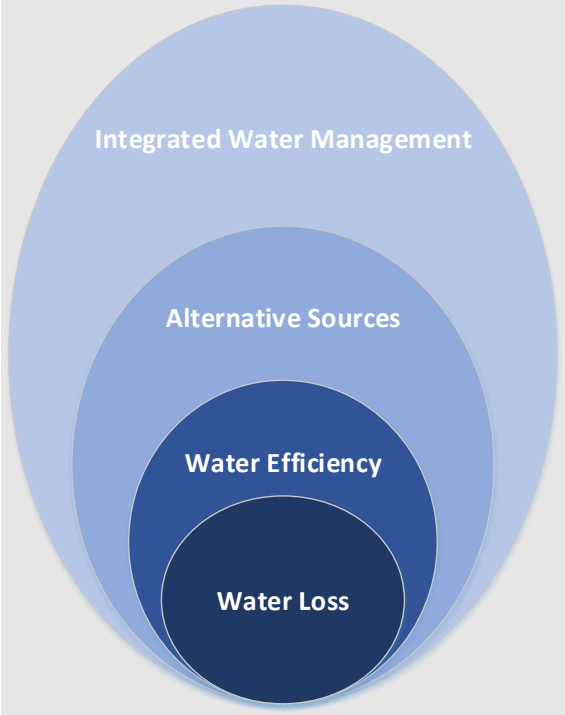
[7] See https://www.hunterwater.com.au/haveyoursay/2025-2030-price-proposal under the heading Stage 5.

Figure 1-3 NSW Water Efficiency Framework



1.4 Where do we need to conserve water?

Hunter Water's approach to water conservation aims to sustainably and effectively manage water demand in a manner that responds to the expectations of our community. Our approach has four focus areas:



Integrated Water Management – ensuring that sustainable water extraction, use and treatment is fully considered when planning for, designing and building towns, cities, businesses and homes.

Alternative Sources – replacing potable water with water from alternative sources by matching end use with fit for purpose water quality.

Water Efficiency – installing more efficient fittings, appliances and equipment and changing water use behaviours to carry out the same activities but with less water consumed.

Water Loss – identifying and repairing leaking fittings and pipes and reducing evaporation and leakage from water storages.

1.5 How are we conserving water?

Water demand is generally divided into four areas:

- *Residential* – this is the water consumed by our customers in their homes and apartments and includes both indoor and outdoor use. Around 60% of the potable water produced each year is used for this purpose.

- *Non-residential* – industrial, commercial and government customers (for example local councils, schools and hospitals) consume around 25% of the potable water produced.

- *Other service providers* – water sold to private network operators

- *Non Revenue Water (NRW)* – the remainder 14% is the water used in areas such as Hunter Water operations and firefighting, or is lost due to leakage from the distribution system or theft. NRW also occurs when metering inaccuracies lead to the volume of water supplied to customers not being fully accounted for.

Hunter Water has a variety of water conservation activities and projects targeting the residential and non-residential sectors. Each initiative aligns with one or more of the water conservation focus areas (water loss, water efficiency, alternative source or integrated water management). Hunter Water also recognises we have a critical role in driving water conservation outcomes by making sure water loss from our distribution system is minimised and that we are using water as efficiently as possible in our operations.

Hunter Water has applied the ELWC methodology to determine whether initiatives are economically efficient. The methodology considers social and environmental costs and benefits in addition to the cost of the water conservation activity or project and the volume of water saved. Further details of this methodology can be found in Appendix A.1.

Water conservation objectives are also an inherent part of Hunter Water's Strategic Asset Management Plan (Appendix A.2). This plan sets out the priorities, framework and process for decision making within Hunter Water, including options for water conservation and service efficiency improvements.

1.6 Who are we working with?

To be effective, water conservation programs need to achieve long-term, large-scale behaviour change with the adoption of new technologies and attitudes towards how water is used. This means that collaboration with customers and community and government is key. Since engagement with our community as part of the LHWSP, further engagement has been undertaken and is being used to inform our future water conservation program as discussed in Section 1.2.

Hunter Water is continuing to engage with large users, councils, DCCEEW, the community and other external stakeholders to share knowledge and support water efficiency. This includes collaborating and sharing information with DCCEEW to help support policy change for water efficiency.

1.7 Monitoring and review

Hunter Water collects and analyses data to report against the objectives of the Plan. Key monitoring data includes water usage (total and sectoral), weather and population growth. Performance against our water conservation objectives is influenced by the following factors:

- Hunter Water's water conservation activities and projects.
- The NSW Government Building and Sustainability Index (BASIX).
- NSW Government water efficiency initiatives (e.g. the NSW washing machine trial).
- The Federal Government Water Efficiency Labelling Scheme (WELS).
- The changing nature of dwelling mix in the Lower Hunter, with an increasing proportion of multi residential dwellings (increasing from 17% to 21% of total residential dwellings between 2008 and 2024).
- The transitioning of the Lower Hunter from a heavy industry to a services-based economy.

Further, Hunter Water monitors the performance of specific investments implemented using the ELWC methodology. Annual monitoring of performance informs the review component of the 5 Year Water Conservation Plan.

2 2023-24 WATER CONSERVATION ACTIVITIES AND PERFORMANCE

2.1 Volume of water sourced and supplied

In 2023-24, Hunter Water supplied 73,664 million litres (or 73.6 gigalitres) of water. The sources of extracted water are listed in Table 2.1. Of this, 3.7 gigalitres of recycled water was supplied for non-potable end uses. Water usage statistics are shown in Table 2.2.

Table 2.1 Sources of water supplied by Hunter Water in 2023-24 (megalitres)

Source of water	Volume sourced in 2023-24	Proportion in 2023-24
• Surface water[1]	63,565	86%
• Groundwater[1]	5,556	7%
• Received from other service providers or operational areas within the urban water system (ML)[1]	1,408	2%
• Recycled water [1, 3]	3,669	5%
Total water sourced	74,198	100%
• Water returned to surface water and groundwater from the urban water supply system[2]	534	
Total water supplied[1]	73,664	

Notes: Figures may not add exactly due to rounding.

1. National Performance Report indicators W1, W2, W5, W7, W26
2. Losses at water treatment plants. NPR Indicator W31
3. An additional 3,017 ML of recycled water was supplied by Kooragang Water

Table 2.2 Usage of water supplied by Hunter Water in 2023-24 (megalitres)

Water Usage	Volume Supplied in 2023-24	Proportion in 2023-24
Potable Water		
• Residential sector[1]	40,736	58%
• Non-residential sector[1]	17,962	25%
• Other service providers (within our operating area)[1]	1,405	2%
• Other service providers (outside our area of operation)	937	1%
• Non-revenue water[1]	9,492	13%
Total potable water supplied	*70,532*	*100%*
Observed average potable water use per person[2]	293 Litres a day (or 107 kL a year)	
Weather corrected average per person potable water demand	293 Litres a day (or 107 kL a year)	
Recycled Water		
• Residential sector[1]	90	2%
• Non-residential sector[1]	3,578	98%
Total recycled water supplied	3,669	100%

Notes: Figures may not add exactly due to rounding.

1. National Performance Report indicators W8.3, W9.3 (with non-revenue water removed to prevent double counting), W14.3, W10.1, W20 and W21 which are all based on the April to April water year.
2. Financial year consumption corrected for transfers to and from other service providers outside of our operating area, includes residential, non-residential and non-revenue water

Climatic conditions have a strong influence on customer water use, mainly because they affect outdoor and cooling tower use. Water use by residential customers is seasonal, with higher use over summer months. Changes in weather can vary annual water consumption by up to 7% compared to consumption under average weather conditions.

The purpose of weather (or climate) correction is to remove, as much as we can, the impact of climatic variations as an influencer on water usage. This helps us determine how much water would have been used under 'average weather conditions'. This is important, as year-to-year total demand figures may show significant variation. Weather correction is necessary to monitor and identify underlying demand trends.

Figure 2-1 shows the long-term trend in observed and weather-corrected water demand. When the dashed and solid lines match then this represents 12-months of average water demand conditions. Although population increased by 28% between 1991 and 2012, total demand for water decreased over that time. Weather-corrected water demand remained relatively constant between 2012 and 2019 before dipping sharply in 2020 due to water restrictions. It has been increasing since that time due to the ongoing softening of customer behaviour. Weather corrected and observed demand were almost identical in 2024 due to the average demand conditions in that period.

Figure 2-1 Observed and Weather-Corrected Total Demand

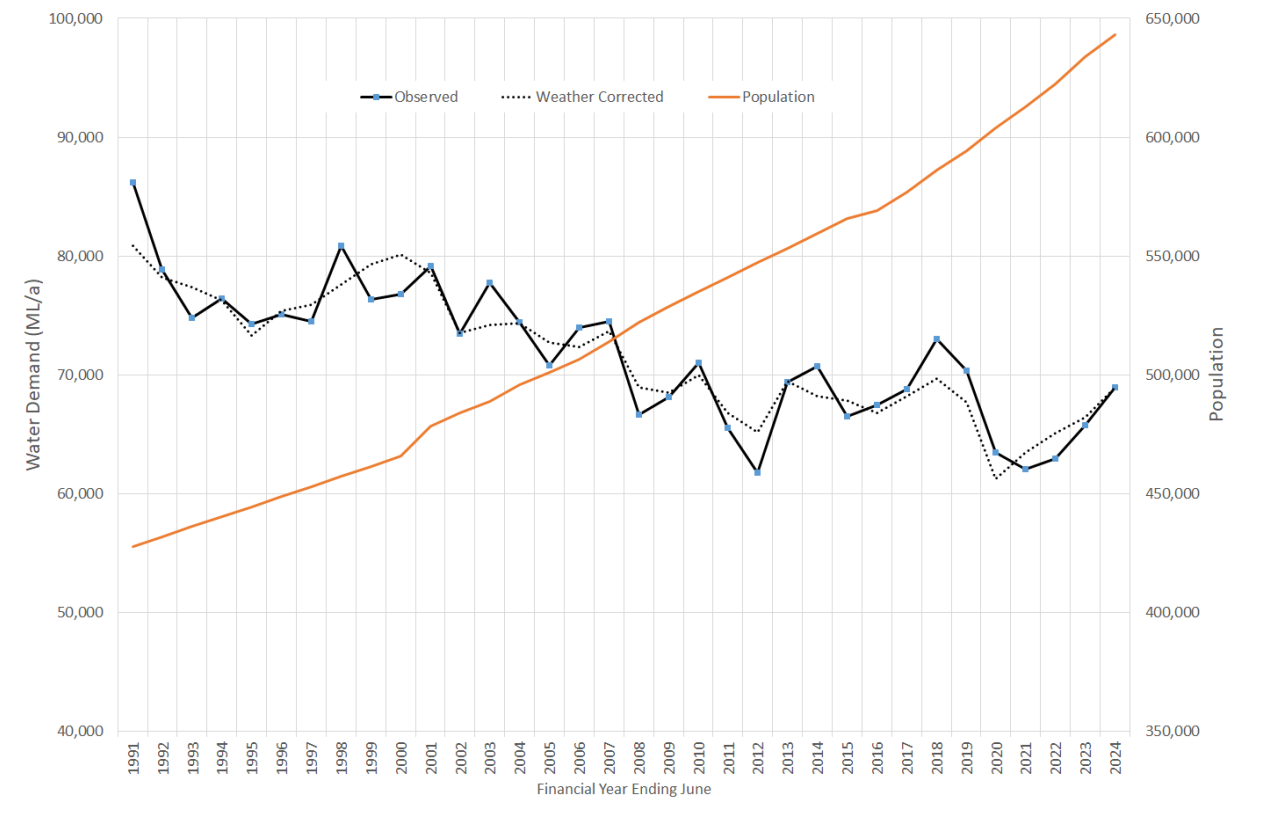


Figure 2-2 Observed and Weather-Corrected Total and Residential Per Capita Demand

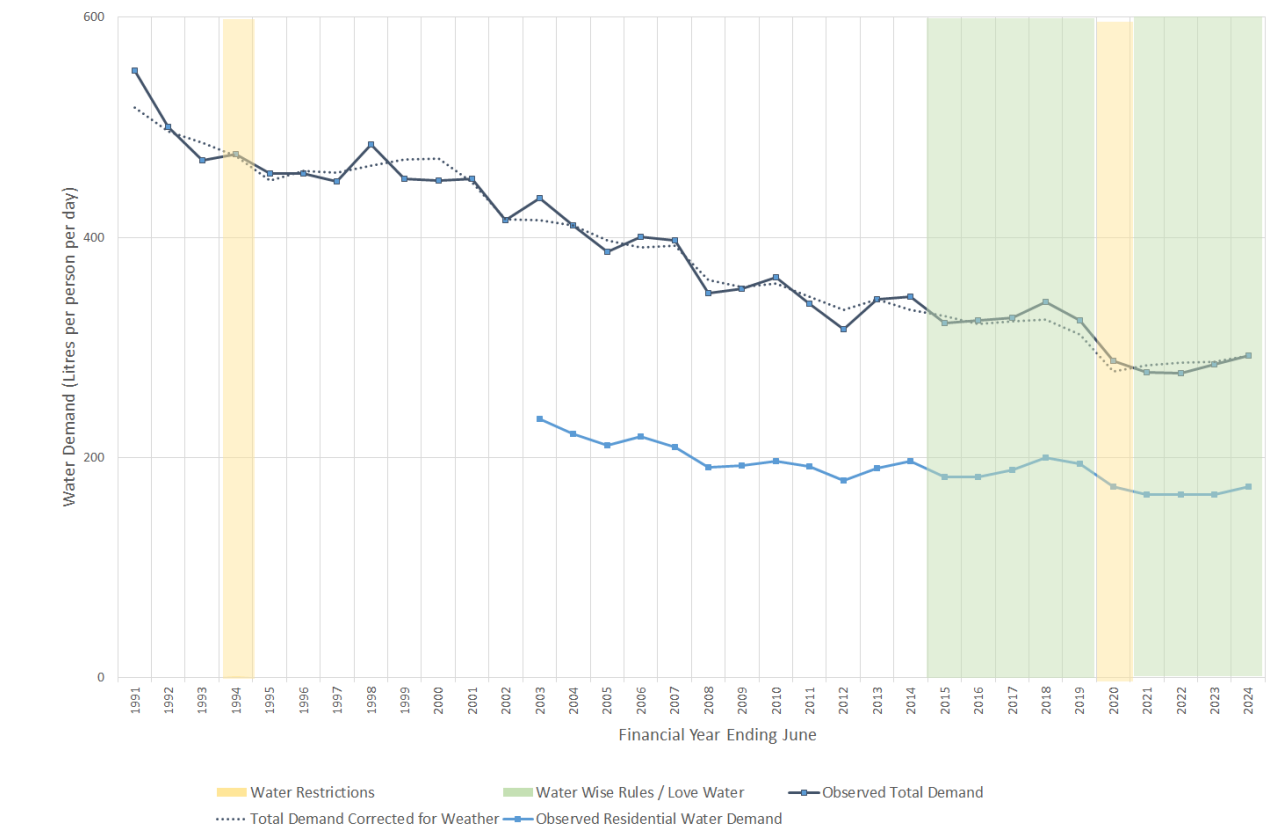


Figure 2-2 suggests that weather-corrected per capita demand has been relatively stable between 2015 and 2019. There was a significant reduction in weather-corrected per capita demand in 2019-20 due to the influence of water restrictions. That result has reversed slightly during the last four financial years, however remains well below pre-restriction levels.

The return to average weather conditions in 2023-24 has resulted in annual per property residential consumption increasing to 159 kilolitres in 2023-24 (up from 152 kilolitres in the previous year). This equates to residential customers using on average 172 litres per person per day in 2023-24, an increase on the 168 litres per person per day recorded in 2022-23. When all of the potable water supplied by Hunter Water is considered (residential, non-residential, service providers within our area of operation and NRW), the equivalent of 293 litres per person per day was used during the year, up from the 2022-23 figure of 284 litres per person per day.

2.2 Performance against the Water Conservation Goals

This section reports and discusses performance against our Water Conservation objectives.

- Reduced total customer drinking water use by 17% compared to baseline usage (customer behavioural response to weather in July 2016 to July 2018) by 2032.
- Reduce residential sector usage to 155 L/p/d under average climate conditions by 2032.
- Reduce non-residential usage by 2 GL compared to the baseline usage under average climate conditions by 2032.
- Reduce leakage ≤50 L/connection/day by 2030
- The LHWSP target of increased use of recycled water to 1.3 GL/year by 2032.

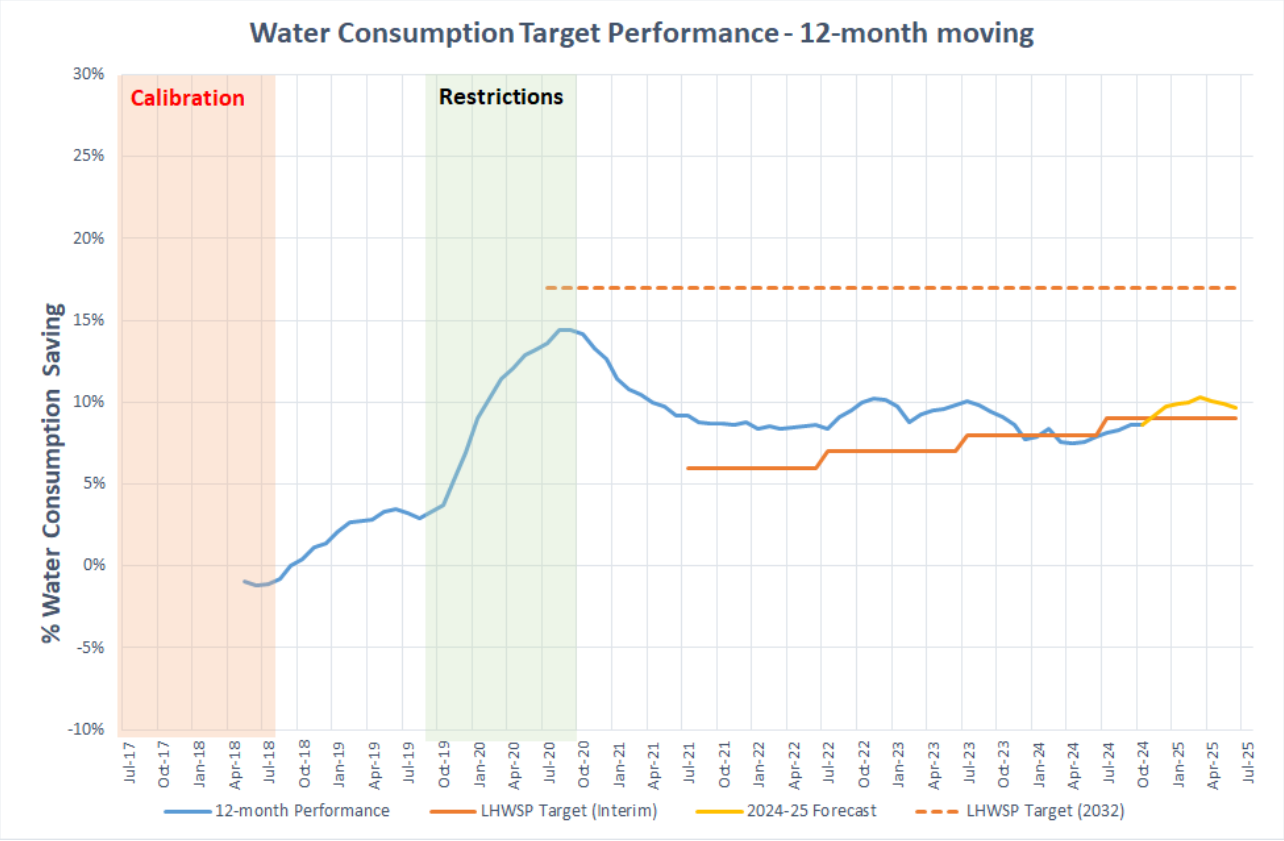
2.2.1 Total Customer Drinking Water Use Performance

Table 2.3 and Figure 2-3 show performance against the interim customer drinking water target for reducing total water consumption.

Table 2.3 Total Customer Drinking Water Use Reduction Performance (% reduction) vs the LHWSP target

Year	Interim Target	Performance	GL Saving (compared to baseline behaviour)
2020-21	N/A	9.2%	5.5
2021-22	6%	8.6%	5.1
2022-23	7%	9.8%	6.1
2023-24	8%	7.8%	5.1
2024-25	9%	N/A	N/A

Figure 2-3 Total Customer Drinking Water Use Reduction Performance



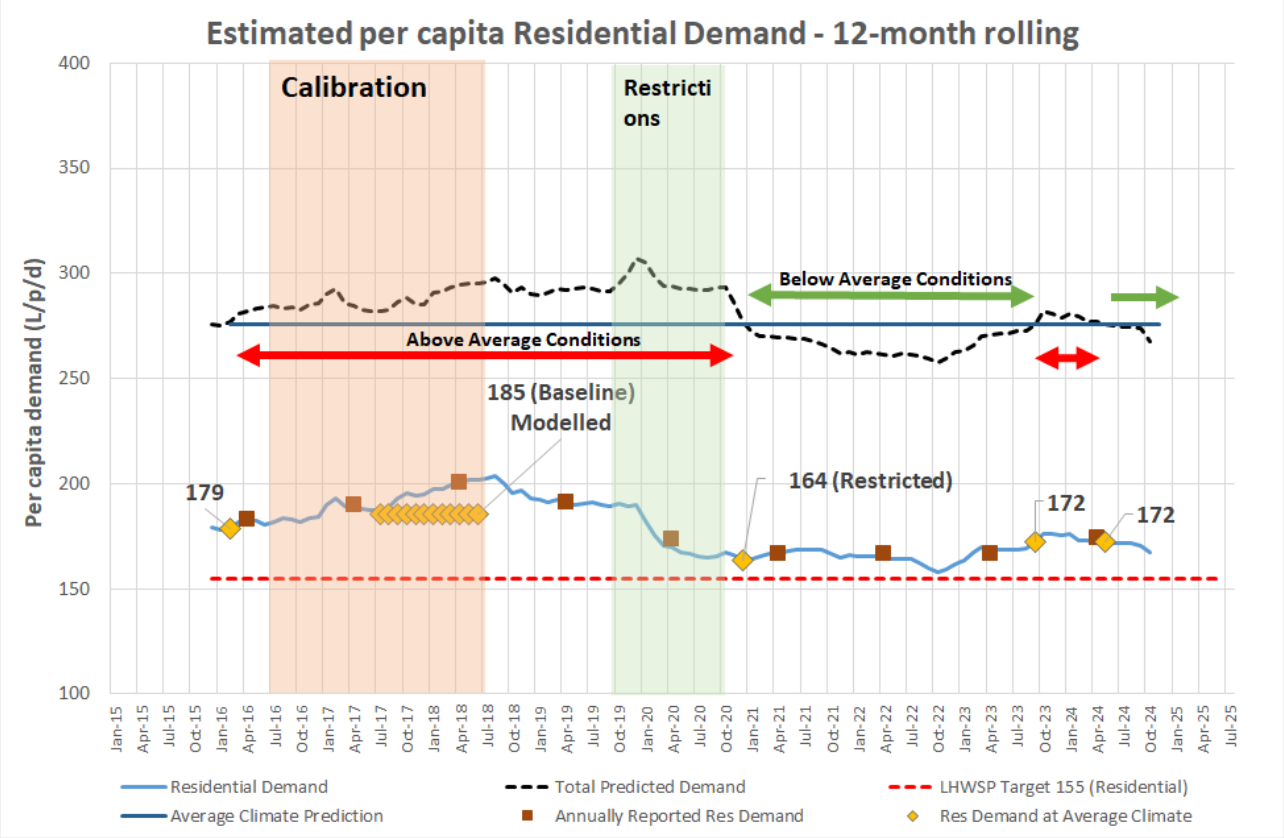
The following points are made with regards to performance against the reduce total customer drinking water use goal:

- The interim LHWSP goal has been met for the 3 recent reporting periods and is forecast to be met for 2024-25.
- A strong short-term behavioural response was exhibited by our customers during the implementation of restrictions during September 2019 to September 2020 before an expected bounce back response occurred post the ending of restrictions.
- All influencing factors outlined in Section 1.7 contribute to the overall percentage saving result.

2.2.2 Residential Sector Water Use Performance

Section 2.5.1 discusses the performance of Hunter Water's water conservation activities targeting the residential sector. Figure 2-4 shows performance through time against the residential sector Water Conservation goal.

Figure 2-4 Performance Against the LHWSP Residential Water Conservation Goal



The following points are made with regards to performance against the residential goal:

- Similar to the percent reduction for total potable water demand, the residential sector exhibited a strong short-term behavioural response during the implementation of restrictions from September 2019 to September 2020 before a classic bounce back response occurred post the ending of restrictions.

- The current estimate of average residential water consumption is 172 litres/person/day and has remained relatively steady over the last 12 months and represents a 7.1% reduction compared to the baseline period. Restricted water demand under average conditions was equivalent to 164 litres/person/day.

- The influencing factors identified in Section 1.7 which contributed to the performance in Figure 2-4 included:

    - Hunter Water's water conservation activities and projects targeting the residential sector

    - The NSW Government BASIX Scheme

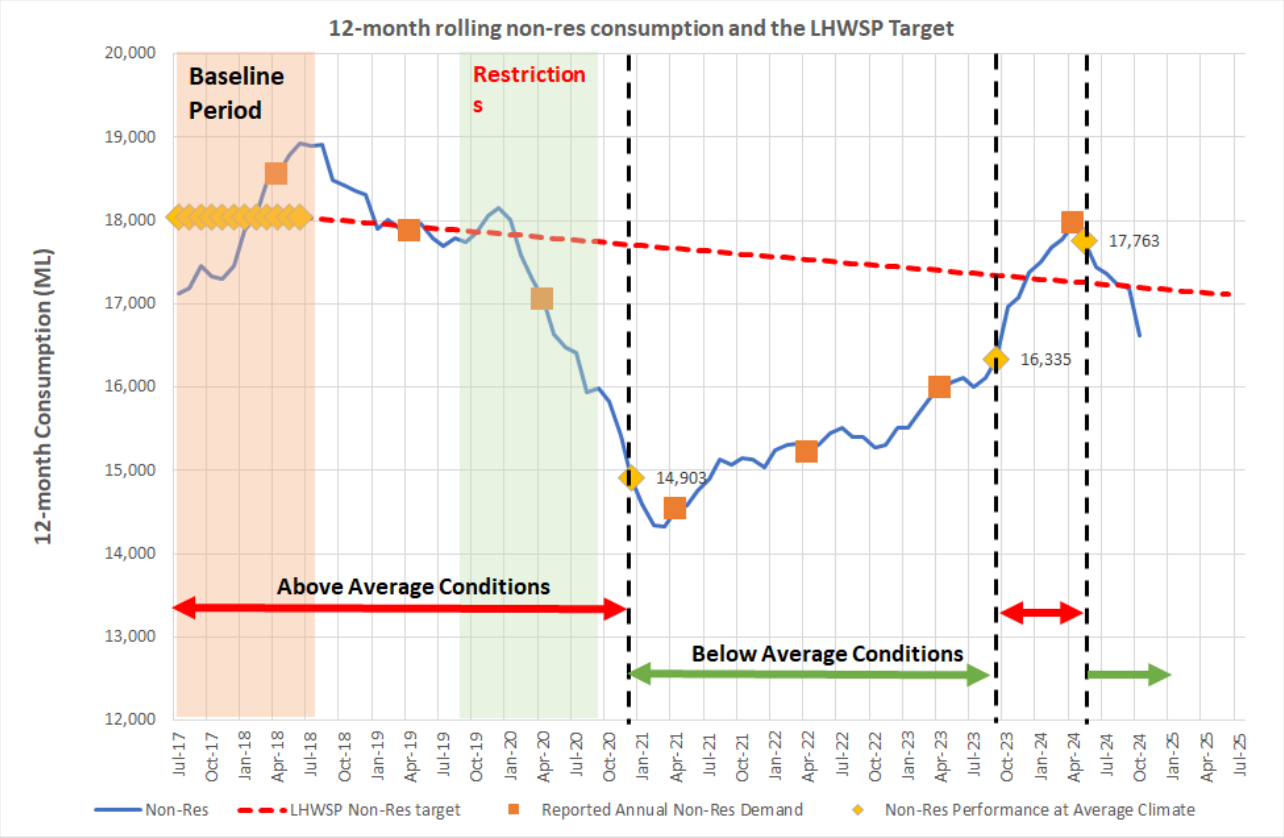
    - The Federal Government WELS

    - The changing nature of dwelling mix in the Lower Hunter.

2.2.3 Non-Residential Sector Water Use Performance

Section 2.5.2 discusses the performance of Hunter Water's water conservation activities targeting the non-residential sector. Figure 2-5 shows performance through time against the non-residential sector Water Conservation Goal.

Figure 2-5 Performance Against the LHWSP Non-Residential Water Conservation Goal



The following points are made with regards to performance against the non-residential goal:

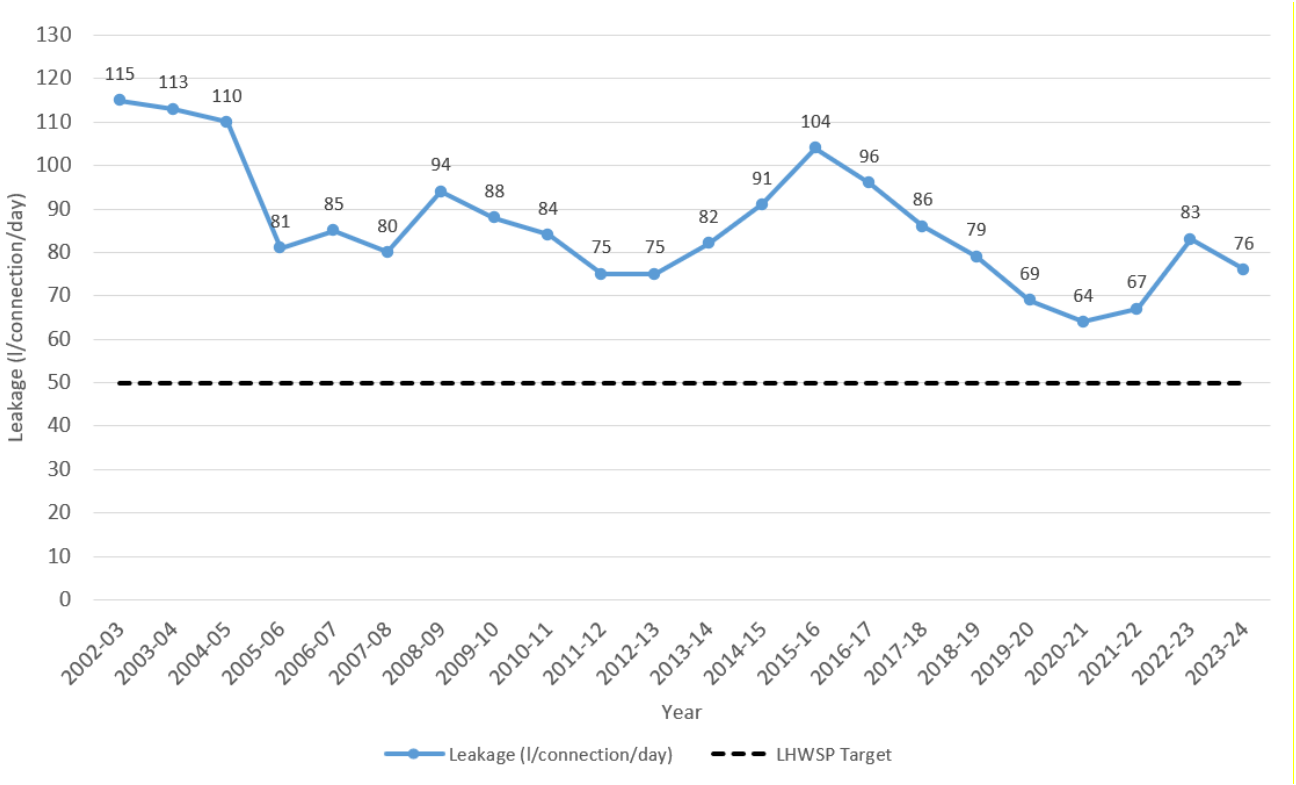
- Non-residential demand under average climate conditions has increased from 14.9 GL in December 2020 (reflective of the impacts of both water restrictions and Covid) to 17.8 GL in May 2024.

- The drivers for this increase relate to post covid recovery for some sectors (e.g. tourism and retail) as well as a change in major customer patterns of use (namely Eraring Power Station and Port Waratah Coal Loader at Kooragang).

2.2.4 Leakage Performance

Section 2.4.2 discusses the performance of Hunter Water's water conservation activities targeting the leakage. Figure 2-6 shows performance through time against the Leakage Reduction Goals.

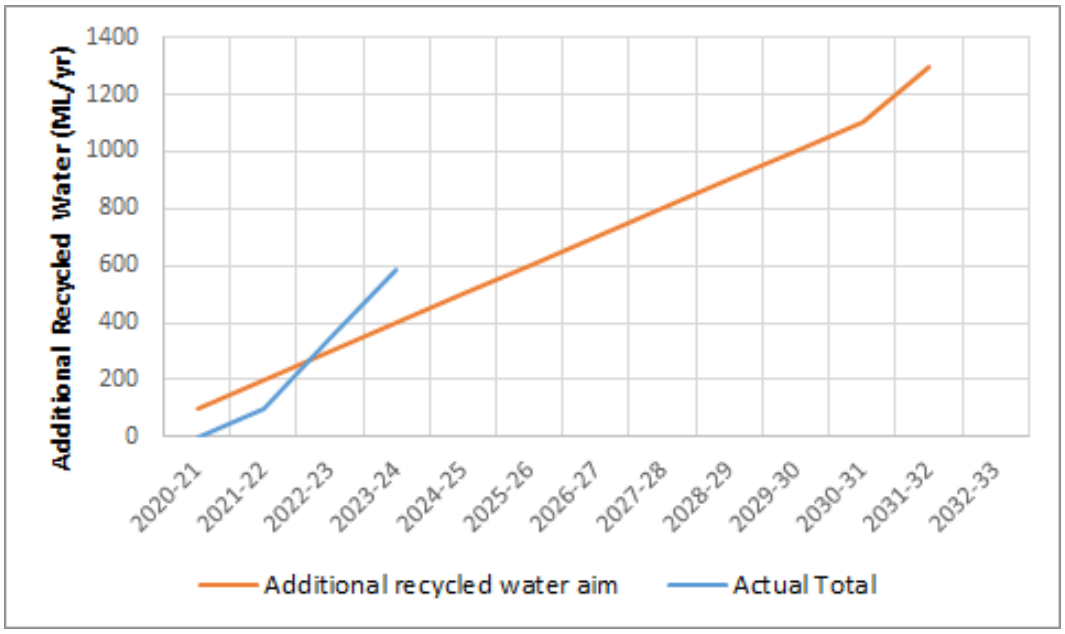
Figure 2-6 Performance Against the LHWSP Leakage Reduction Goal



2.2.1 Recycled Water Performance

Section 2.5.3 discusses the performance of Hunter Water's recycled water program. Figure 2-7 shows performance through time.

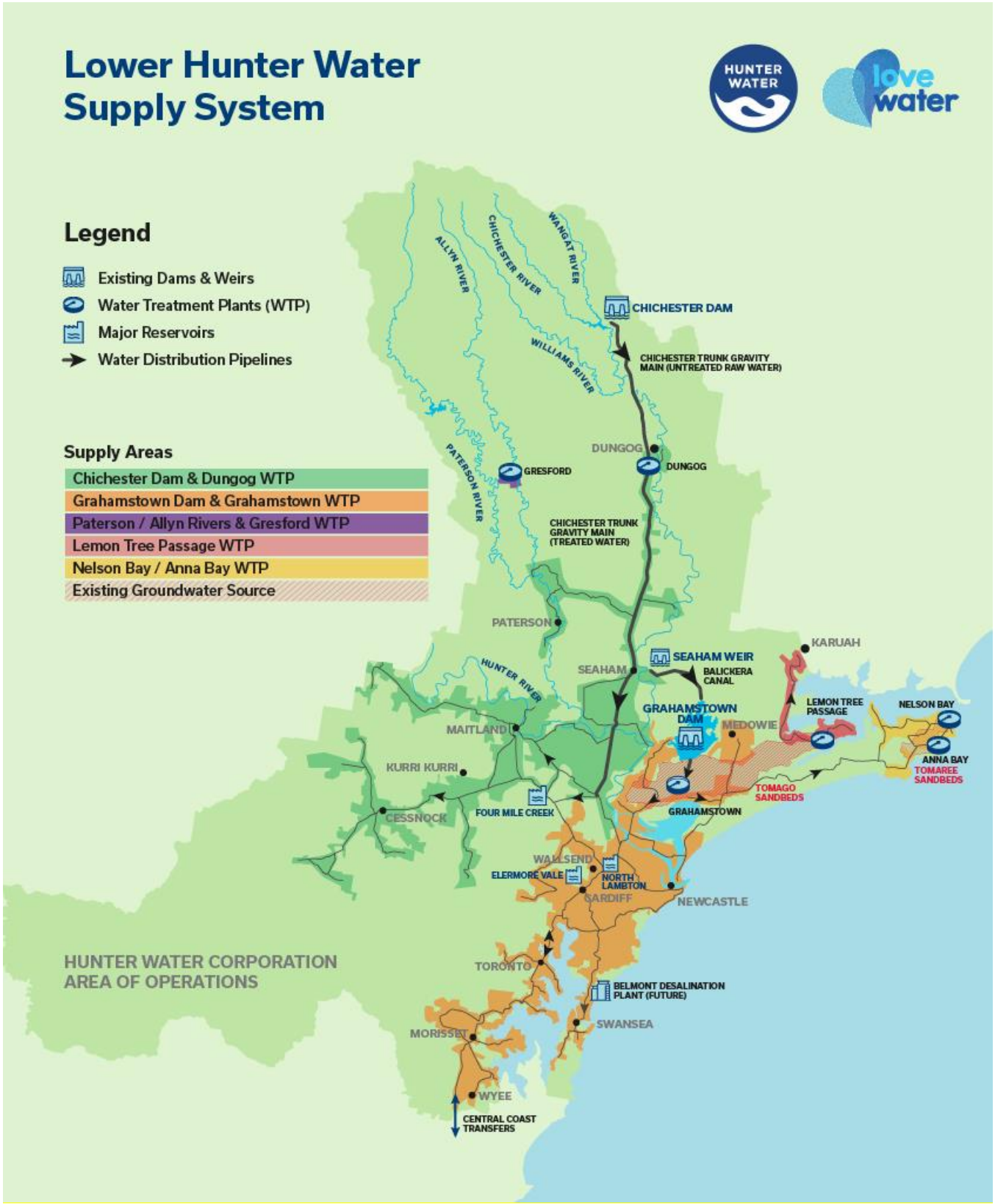
Figure 2-7 Performance Against the LHWSP Additional Recycled Water Aim



2.3 Water Conservation Measures for Water Storage and Transmission

Hunter Water extracts water from the Williams, Paterson and Allyn Rivers as well as groundwater sources under conditions specified in our Water Licence and approvals package issued under the *Water Management Act 2000.* Figure 2-8 provides an overview of Hunter Water's raw water storage, treatment and transmission assets.

Figure 2-8 Hunter Water storage, treatment and transmission network



2.3.1 Source Operating Strategy and Bulk Supply Procedure

Current Strategy and Procedure

Hunter Water's Source Operating Strategy ensures that our bulk water sources are operated in a manner that maximises net water storage levels, while also considering source water quality and ensuring compliance with regulatory requirements that govern the operation of the bulk water assets. The Strategy comprises procedures that guide operational decisions in areas where Hunter Water has discretion. These decisions relate to how much water should be supplied from particular sources, and how much water to transfer from the Williams River into Grahamstown Dam.

The key mechanisms by which the Source Operating Strategy is implemented on an ongoing basis are the Bulk Supply Procedure and the Balickera Pump Station Procedure.

The Bulk Supply Procedure specifies the target rates of supply from the major bulk surface and ground water sources that are used by Hunter Water. This procedure reflects the water supply assumptions used in the 2022 LHWSP and in the 2023 Lower Hunter Drought Response Plan. These operating rules were designed to minimise the risk of the bulk water sources running out of water and to manage water quality.

The Balickera Pump Station Procedure specifies when water should be pumped from the Williams River to Grahamstown Dam relative to the water level in the dam, water quality in the Williams River and water level at the entrance to Balickera Tunnel. These operating constraints are also reflective of the assumptions used in the 2022 LHWSP.

Decisions relating to which raw water source to use at Gresford (which can be supplied by either the Allyn River or Paterson River) are specified in the relevant Water Supply Work and Water Use Approvals.

Proposed Changes to Strategy and Procedure

Changes have been proposed to the Source Operating Strategy and associated procedures due to Hunter Water reducing the operating level in Grahamstown Dam to address dam safety concerns. The dam safety concerns were identified through the first routine risk assessment and safety review of Grahamstown Dam under the new regulatory framework, which came into effect in November 2021. The Grahamstown Dam review was completed in May 2024.

As a result of this review, Hunter Water identified an unacceptable risk of failure of the Main Embankment of Grahamstown Dam due to potential liquefaction of the sand shoulders in the event of a large earthquake. While there are no practical interim risk reduction measures available to Hunter Water to reduce the likelihood of a failure of Grahamstown Dam, the consequences of a failure can be reduced by lowering the top water level (TWL) of the dam until permanent works can be undertaken to strengthen the embankments. The key changes that have been proposed for the Source Operating Strategy and associated procedure are:

- Reduce the TWL of Grahamstown Dam from 12.6 to 11.5 mAHD (already implemented).
- Changes to the cut out level for Balickera WPS, which transfers raw water from the Williams River to Grahamstown Dam.
- Reduce the drought trigger for operating Tomago Borefields from 70% to 60% reported storage in Grahamstown Dam.

- Optimisation of water storage triggers for sharing of water between Hunter Water and Central Coast Council.

2.3.2 Evaporation reduction

Evaporation losses from Grahamstown Dam are significant and Hunter Water has investigated several options to reduce these losses. Hunter Water have investigated the economic viability of floating solar and what actions would need to be undertaken to enable this into the future. Issues being considered are water quality risks and the evaporation benefits. Initial analysis indicates that floating solar systems are in their infancy and are not yet economically feasible at scale.

2.3.3 Leakage in Water Storage and Transmission infrastructure

Leakage is a consideration of the Asset Management Plans for raw water assets. A summary of existing programs to manage leakage is summarised below:

- Condition assessments are periodically carried out on the dams and downstream raw water mains. These assessments monitor the overall condition of the assets and inform the program of management initiatives included in Asset Management Plans.
- The section of CTGM upstream of the Dungog Water Treatment Plant is monitored for leakage as part of District Metered Area (DMA) monitoring.
- Daily inspections are undertaken at the Chichester and Grahamstown Dams including the measurement of seepage at two locations at Chichester Dam and at the Irrawang embankment of Grahamstown Dam. Results are reported 6-weekly to the Hunter Water Dams Management Committee.
- Leakage from borefields raw water infrastructure is managed through maintenance inspections and periodic operational exercises

2.4 Water Conservation Measures for Water Treatment and Transmission

This section reports on activities implemented in 2023-24 targeting water conservation performance at WTPs and the transmission network.

2.4.1 Measures to improve water conservation at WTPs

No specific water conservation activities were implemented at water treatment plants in 2023-24. In previous years, the following activities were implemented at Grahamstown WTP as water conservation measures to reduce losses:

- Increasing the effectiveness of sludge withdrawal from clarifiers through the sludge rake replacement project;
- Improving the operation of the filter backwash process to increase the recovery of backwash water.

2.4.2 Reducing Hunter Water Leakage & Consumption

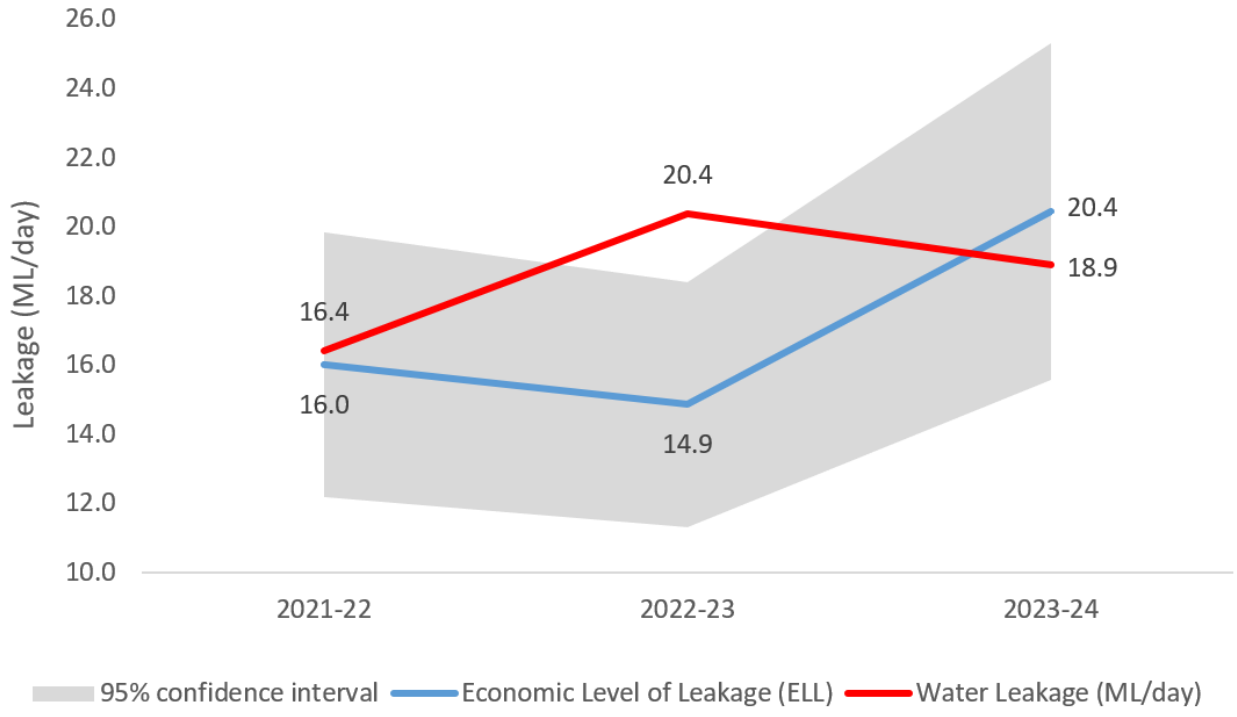
Hunter Water is continuing to implement leakage reduction programs including:

- Active leakage control
- Pressure management

- District metered areas (DMA)
- Repair of point sources

Leakage programs are justified based on achieving an Economic Level of Leakage (ELL) which is the point where the cost of reducing leaks equals the value of the water saved. It is based on a least cost model to determine the best rate of expenditure to manage leaks with the aim of reducing leakage to the ELL within 95% confidence interval. Hunter Water's ELL for 2023-24 has been calculated in accordance with the ELWC methodology approved by IPART in August 2019. Leakage performance is shown against the ELL in Figure 2-9.

Figure 2-9 Actual Leakage vs the Economic Level of Leakage (ELL) in our system



NRW, including leakage, decreased in 2023-24 by 341 ML from 9,833 ML to 9,492 ML. The key drivers in this reduction included significant break events passing outside of the reporting period and a source volume correction after a metering issue relating to Grahamstown WTP process water was identified. While the metering issue also impacted historical results, corrections have not been applied retrospectively.

Hunter Water's 2023/24 leakage was 76 L/connection/day. The 2023-24 value constituted a reduction from 83 L/connection/day in 2022-23.

While leakage has partially improved from the levels experienced last year, the 2023-24 performance did not meet target. While investigations are underway to better understand the impact from all drivers known to influence performance, a key factor is understood to be a sustained general increase in watermain leaks and breaks.

Performance is forecast to improve as the ongoing program of works are implemented, with forecast leakage expected to meet the 2030 target.

Hunter Water has prioritised the following areas:

- Identify and repair leaks, including sustained levels of active leakage detection.
- Prioritise delivery of high value DMAs
- Progress trials of new leak detection technology
- Improve NRW data governance processes and analysis capabilities
- Improve metering at Hunter Water sites to improve the accuracy of leakage volumes.

Everything that was considered up to 2023-24 and was economically viable is currently in the program of works for implementation.

Further details of water loss activities undertaken 2023-24 are below.

Leak Detection

The survey of more than 6,100 km of water mains was completed using active leak detection technology to identify over 830 leaks, many of which were hidden from sight. A leak detection survey covering approximately 4,160 kilometres per year has been assessed as economically efficient at full storage levels, however a higher rate has been sustained in response to significantly higher network leakage levels and will be maintained until performance stabilises.

Annual expenditure on leak detection was $700k in 2023-24 with costs on a length of main surveyed basis consistent with the previous financial year.

Pressure management

In the current price period (2020-25), we have an approved program of works to address unnecessarily high pressure in several areas of our network. Reducing pressure reduces leakage. Construction of the first package of zones commenced during 2023-24, however the projects are not yet delivered so the full benefits are yet to be realised. Annual expenditure in 2023-24 was $1.4m.

District metering

District metering involves installing network flowmeters and zone valves to segment the network into smaller ‘districts’. Water movement in each district is then monitored and analysed, and any increased water use may indicate a leak in that district. Dividing the network into segments means we can identify and repair leaks more quickly, which reduces costs and customer interruptions.

Hunter Water’s current program of works includes an increase in the coverage of district metered areas to 96.5% of the network. In 2023-24 flowmeters were installed to increase DMA coverage to 80% of the network with an annual expenditure of $3.8m.

Point sources

This program fixes water lost, or likely to be lost in the near future, at our major assets, including reservoirs and trunk water mains. The repair of two reservoirs (Black Hill and Four Mile Creek) has been undertaken during this price path. In 2023-24, construction commenced on the replacement of a large leaking trunkmain at Louth Park with annual expenditure of $870k.

Table 2.4 presents assessment of leakage project performance for 2023-24.

Table 2.4 2023-24 Water Loss Conservation Measures

Program	Driver for Investment	Assumed Saving (ML)	Actual saving[2]	Expenditure ($M)	$/kL
Active Leakage Detection	ELWC	806	TBD	$0.7	1.50

Pressure Management	ELWC	160[1]	TBD	$1.4	<3.01
District Metering	ELWC	360[1]	TBD	$3.8	1.41
Point Sources	ELWC	60[1]	TBD	$0.87	4.27

Note 1: These are the forecast savings for the completed packages of works.

Note 2: Actual savings will be achieved as packages are commissioned. Processes for assessment of benefits are currently under development.

Use of recycled water to offset potable water use at Hunter Water sites

Opportunities to replace potable water supplies and implement water efficiency improvement works were progressed the following sites:

- Shortland WWTW – in the design phase
- Edgeworth WWTW – in the design phase
- Toronto WWTW – in commissioning phase

Performance of these projects cannot be assessed as they are not yet complete.

Unauthorised usage

Theft can occur through a number of means including water stolen from hydrants using unmetered standpipes, illegal water connections, tampering with and bypassing meters and unauthorised use of unmetered fire services in commercial and industrial settings.

Hunter water has processes in place to reduce unauthorised usage, including:

- Issuing metered standpipes to customers.
- Established processes for meter installation for new connections.
- Monitoring for unmetered connections undertaken by civil maintenance and active leakage detection crews.

Authorised unbilled usage

Authorised unmetered usage and Hunter Water management processes include the following:

- Water utilised through operation of Hunter Water assets including treatment plants, wastewater pumping stations for odour control, watermain flushing after pipe repair or to remove dirty water. Ongoing work is being undertaken to improve our understanding and identify reductions in this usage, including a project to assess and upgrade metering at Hunter Water treatment plants which was in the design phase during 2023-24, with planned implementation in 2024-25.
- Fire fighting usage by emergency services through network hydrants – estimates are currently applied for this usage.
- Premise fire service usage – usage is informed through bypass meters with further work proposed to investigate levels of usage in the coming price path.

Other works

There are a number of other works that support water loss management but are justified through other drivers and include:

- Water main replacement program – the ongoing replacement of reticulation mains with a history of multiple breaks or leaks recorded. The replacement of water mains is primarily

driven by asset lifecycle costs, however the value of the water lost through leaks and breaks is also taken into consideration. In 2023-24, 30 km of reticulation water mains were replaced.

- Water service replacement program – the ongoing replacement of service mains (pipe located between the reticulation main and customer meters) that have previously failed. The replacement of water services is primarily driven by asset lifecycle costs, however the value of the water lost through leaks and breaks is also taken into consideration.
- When water mains do break, we minimise the quantity of water lost by promptly responding to and rectifying the break.

2.5 Water Conservation Measures for Customers

2.5.1 Residential

In 2023/24, three programs targeted water conservation in the residential sector:

- Essential Plumbing Assistance;
- Customer leaks identified as part of the Active Leak Detection program in the transmission network; and
- High consumption monitoring.

The Essential Plumbing Assistance Program focusses on helping customers facing financial stress. The program offers repairs often relating to leaking or broken taps, toilets or pipes. Assisting customers with these repairs, not only reduces water loss but also limits water usage charges on the account and helps to minimise the customer's debt and maintain long-term payment of water bills. Over the 2023-24 financial period we supported 65 customers. Annual expenditure in 2023-24 was $22k.

During 2023-24, over 300 customers were contacted about potential leaks on their property. These were leaks that had been identified by Hunter Water during acoustic surveys of the water distribution network or through examining customer billing data. The total cumulative instantaneous flow of these leaks was estimated to be approximately 1.4 megalitres per day being lost through concealed leaks underground and in toilets, taps and pipes in homes. This project has not been assessed against ELWC as it is a byproduct of our water loss program.

Hunter Water is committed to improving early identification of high consumption and leak detection with our residential customers. In 2023-24, we reviewed our thresholds for residential usage and improved our identification and customer engagement. Notifications were introduced to alert higher than normal usage, based on reviewed threshold figures, as well as earlier referral to our Customer Assistance team where vulnerable indicators are present.

Table 2.5 summarises the performance of investment programs implemented specifically targeting water conservation in the residential sector:

Table 2.5 2023/24 Performance of Residential Water Conservation Measures Excluding Love Water

Program	Driver for Activity	Participants	Assumed Saving (ML)	Actual saving	Expenditure ($k)	$/kL
Essential Plumbing Assistance	ELWC	65 households	9	Under assessment	$22	$2.44
Customer Leaks identified as part of ALD	Leakage Reduction	Over 300	TBD	Under assessment	$0 as delivered under another program	N/A
High consumption monitoring	Customer service	TBD	TBD	TBD	$0 as delivered under another program	N/A

All of Hunter Water's residential water conservation behavioural influencing activities are positioned under the Love Water brand to ensure alignment with the clear, consistent message of the value of water. This message was balanced with also providing 'how' customers could save water in their homes and gardens.

As a subset of Love Water, Smart Water Choices Program is important in maintaining capacity to respond to community queries and reports that are made. Our Call Centre has scripts in order to respond to queries regarding Smart Water Choices and, if necessary, this can be escalated to others within the organisation. Our website also contains supporting information.

Community engagement and the promotion of water conservation behaviours were key in encouraging customers to not only comply with Smart Water Choices but to also reduce their consumption in other ways. An overview of the engagement and communications initiatives is provided in Table 2.6.

Table 2.6 Water conservation community engagement programs & partnerships in 2023-24

Description	Actions in 2023-24
Love Water Campaign	We continued our Love Water campaign to build on previous water conservation messaging, with our TV ad drawing on content from past campaigns to highlight our region's resilience and sustained behaviour change following drought in 2019. The campaign increased presence in the market during the spring and summer periods. Our campaign messaging was updated in early 2024 to reflect the need to save water in any weather, with wetter conditions than previously predicted. Our presence in the market continued during autumn and was reduced over the winter months.

Description	Actions in 2023-24
Education Program	Our school education programs reached over 7,000 students in the Lower Hunter this year, and we continue to educate students all the way from preschool to Year 10. Our diverse programs have engaged with students about all aspects of the urban water cycle and are tailored to support NSW curriculum. Water conservation remains the cornerstone of the school program, and we have been able to build our engagement to instil a deeper understanding about the processes and people involved in ensuring a resilient water supply. Each incursion or excursion explores how children can do their part to use less water day to day, even when we have periods of high rainfall. Teachers are provided follow-up activities and resources to continue to implement water saving behaviours in their centre/schools, and support students to become advocates in their homes.
Hunter Water Website	Our website includes a dedicated Smart Water Choices section outlining the Lower Hunter's permanent water conservation measures and information on how to be water efficient around the home, and in business. The tips and information provided complement the Love Water objectives. The carousel on the website homepage has consistently included promotion of water conservation habits and benefits seeking to connect with customers at an emotional level. Our online water usage calculator has also continued to be popular attracting 291,904 views, indicating our community is thirsty for more when it comes to understanding their water use behaviours.
Community Events	We continued to have a strong presence at community events across all local government areas in our area of operations, providing opportunities to promote our water conservation messaging. These events included Living Smart Festival, Surfest, Girls Day Out Women in Sport, the Newcastle and Maitland Shows. These opportunities allowed us to engage with our community through conversation and ensure we had a visible presence to promote our Love Water brand and communicate the value of saving water. During National Water Week in October 2023, we focussed attention on the fourth annual Love Water Day on the Saturday as an online event. We called on our community and encouraged advocates to share on social media channels how they value and conserve our most precious resource.
Media – Awareness Raising	In our media messaging during 2023-24 we had prepared for a hot, dry summer due to the BOM declaring an El Niño climate phase however this did not eventuate to the extent forecast, so we continued to emphasise and reiterate Smart Water Choices as part of our Love Water campaign. Our awareness campaign included television commercials, radio, print, digital advertising, billboards and bus spreads. This was supported by an active and growing social media presence and through earned media.
Community Funding Program	In 2023-24, in the strongest field of applications ever received through the Love Water Grants program, we supported 18 community groups and organisations, awarding more than $125,000. Each successful project contributed to water conservation and efficiency initiatives, as well as community education and advocacy, where we will see continued benefits in years to come.
Support of WELS	We continued to support the Water Efficiency Labelling & Standards (WELS) scheme for household appliances by including information on WELS under the 'How to save water' section of the Hunter Water website and through our customer communications. In addition, Hunter Water attended several community events to promote and encourage householder uptake of water efficient products.
Smart Water Advice	Ongoing collaboration with the Water Conservancy (formerly Smart Approved WaterMark) has meant that we have been able to adopt, embed and link to the latest best practice water efficiency advice on our website.

2.5.2 Non-Residential

During 2023-24, there were 30 relocatable data loggers deployed to help identify leaks at Hunter Water sites and on customer assets including hospitals, schools, council and business sites. This was in addition to the existing 360 permanent data loggers rolled out across major and large industrial and commercial customers to assist with the early detection of leaks, irregular usage, and zero consumption for timely meter exchange. Water savings of 272 megalitres were achieved during the year through the repair of leaks and faulty valves and operational improvements identified as a result of this Find & Fix initiative.

Hunter Water has continued to work with our large and major non-residential customers to assist them to prepare and implement Water Efficiency Management Plans (WEMPs). This has included detailed water audits of their businesses to help identify water savings that can be achieved through improved operational processes, leak repairs, fittings upgrades, cooling tower and irrigation system improvements and the use of alternative water sources. During 2023-24 we undertook a review of the WEMP process and have now moved from just focusing on water conservation to a full end to end process to include metering, contingency of supply, trade waste, sewage discharge factors and alternative supply. The review was undertaken as we were seeing smaller savings over time from this program as we work with the customers using less water. As of the end of 2023-24 a total of 75 customers have completed a WEMP (10 were completed in 2023-24). Saving of 293 megalitres were achieved during the year from businesses implementing WEMP initiatives.

Table 2.7 summarises the performance of investment programs implemented specifically targeting water conservation in the non-residential sector.

Table 2.7 2023-24 Performance of Non-Residential Water Conservation Measures

Program	Driver for Investment	Scope of Works	Assumed Saving	Actual saving	Expenditure	$/kL
Find and Fix	ELWC	400 loggers	125 ML	272 ML	$244k	$0.90
WEMP	ELWC	10 new WEMPS	241 ML	293 ML	$169k	$0.58

Collaboration with the six local councils in our area of operations has continued to be a focus to make the region more water resilient. Throughout 2023-24, a number of workshops have been completed to develop a framework for building Council Drought Response Plans (DRP). These plans will enable future planning for projects and a better working relationship during drought conditions.

2.5.3 Alternative Sources

Recycled water forms an important part of our supply ‘portfolio’ by utilising these resources in applications where drinking-quality water is not required.

Hunter Water operates 19 wastewater treatment plants across the Lower Hunter. Hunter Water has 16 recycled water schemes which provide water for industry, irrigation, agriculture and residential use. Approximately 9 per cent of effluent is treated to a recycled water standard and supplied to recycled water users.

We consider recycled water to be a water conservation initiative when recycled water is provided instead of drinking water. A summary of our recycled water scheme performance in 2023-24 is provided in Table 2.8. As a result of recycled water operations, approximately 5,506 ML of drinking

water was conserved. Our plant and supply locations are shown in Figure 2-10. We also used recycled water for internal purposes at our own wastewater treatment plants.

Several reuse schemes are currently have been investigated by Hunter Water, including the Newcastle Stormwater Harvesting Scheme and Lake Macquarie Irrigation Scheme. The Lake Macquarie Irrigation Scheme is in the delivery stage and will supply recycled water from Edgeworth Wastewater Treatment Works for the irrigation of nearby sporting fields. The schemes in development could capture stormwater and recycle wastewater to provide irrigation and greening benefits to the Newcastle Jockey Club, TAFE colleges, and some sporting fields in the community.

Hunter Water continues to engage with stakeholders, including council and the community, about how we value the social, environmental and resilience benefits that recycled water and stormwater harvesting provides. Reflecting the true value that recycled water and stormwater harvesting provides will ensure that future opportunities are not overlooked.

Figure 2-10 Hunter Water's water recycling operations

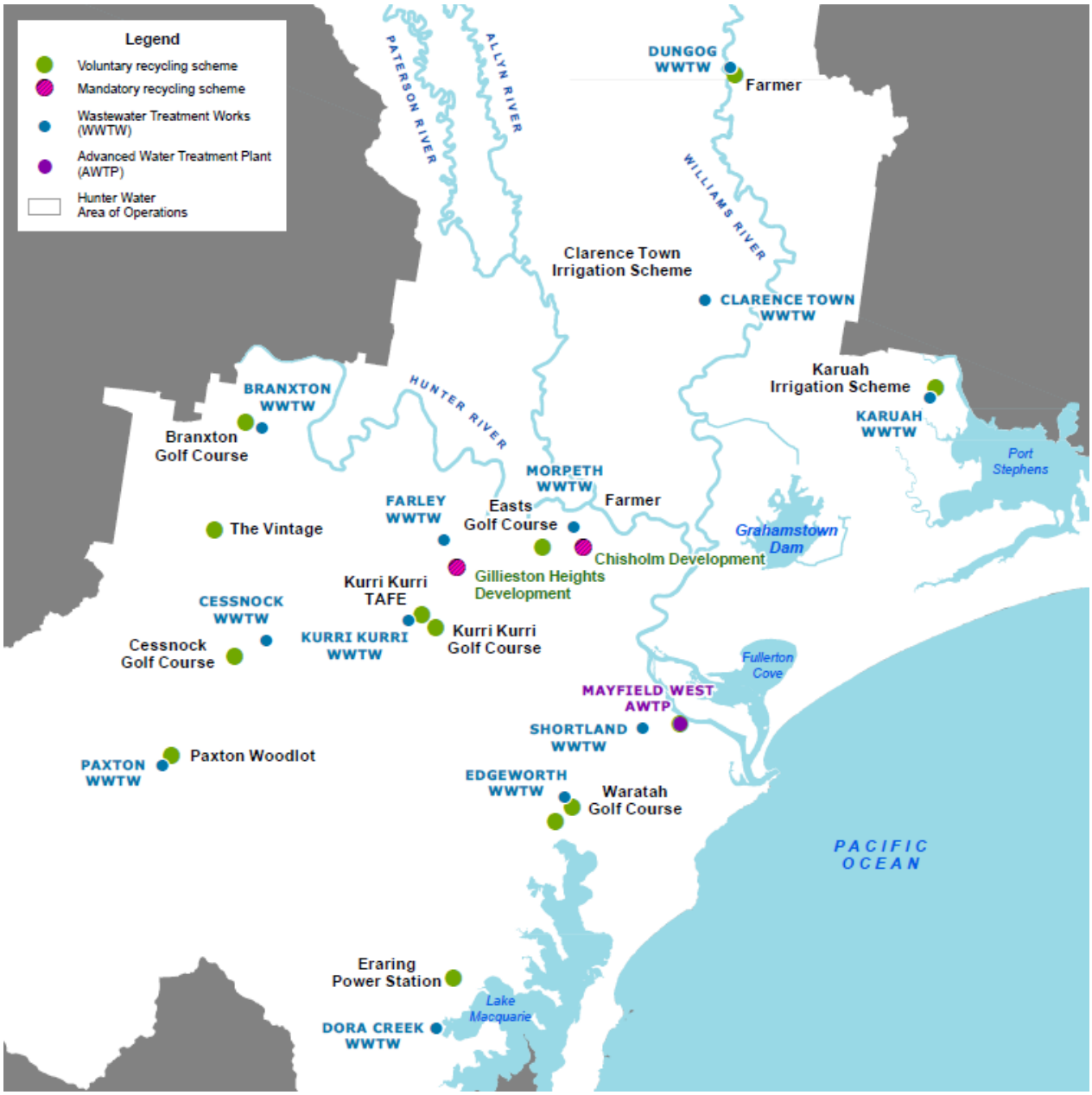


Table 2.8 Volumes of recycled water supplied by scheme in 2023-24

Rcycled water	Recycled water use	2023-24 reuse volumes (ML)	2023-24 drinking water replaced (ML)
Branxton WWTW	Branxton Golf Course & The Vintage Golf Course	242	242
Cessnock WWTW	Cessnock Golf Course	0	0
Clarence Town WWTW	Clarence Town Irrigation Scheme	36	-
Dora Creek WWTW	Eraring Power Station	885	885
Dungog WWTW	Local farmer	171	-

Edgeworth WWTW	Waratah Golf Course	94	94
Farley RWTP	Gillieston Heights dual reticulation	65	65
Karuah WWTW	Karuah Irrigation Scheme	12	-
Kurri Kurri WWTW	Kurri Kurri Golf Course and Kurri Kurri TAFE	30	30
Shortland WWTW	Kooragang Industrial Water Scheme	3,017	3,017
Morpeth WWTW	Easts Golf Course and local farmer	63	63
Morpeth RWTP	Chisholm dual reticulation	25	25
Paxton WWTW	Paxton Woodlots	23	-
Indirect agricultural reuse[1]	Downstream irrigation users	936	-
On-site reuse	Process water at Hunter Water WWTWs	1,084	1,084
Total		**6,686**	**5,506**

Notes:
1. Indirect agricultural reuse includes discharges from Cessnock WWTW and Farley WWTW to downstream watercourses that are beneficially used for agricultural irrigation. Estimates are determined based on weather conditions throughout the year and calculated irrigation rates for downstream users.

2.5.4 Integrated Water Management

Hunter Water lead a working group with the local councils of Newcastle, Lake Macquarie, Cessnock, Port Stephens and Maitland to focus on Integrated Water Cycle Management (IWCM) opportunities and water conservation. The role of this group is to collaborate to better manage public spaces within the region and to identify funding for related programs. The Hunter Joint Organisation of Councils have also recently joined this group.

The working group has resulted in the development of strong stakeholder relationships in our region.

3 FIVE YEAR WATER CONSERVATION WORK PROGRAM

3.1 Program Overview

Water conservation continues to be important to our customers and the community and was explored in detail as part of a deliberative forum Community Panel process from November 2023 to May 2024.

An adaptive approach will be adopted over time as the effectiveness of programs are assessed, customer insights sought and ELWC methodology revised as required.

The Five Year Water Conservation Plan presented in this report is based on Hunter Water's 2025-30 Pricing Proposal Submission to IPART (in September 2024).

3.1.1 Summary of program assessment

Table 3.1 provides an overview of the water conservation projects and activities that have been considered as part of Hunter Water's approach to water conservation.

Further details on each project that forms part of our five-year plan is provided in Section 3.2.

Table 3.1 Water Conservation Projects and Activities for Consideration in the 5 Year Plan

Activity / Project	Levelised Cost[8]	Economic Method to Assess Implementation[9]	Economically efficient[2]	Annual Uptake Target (per year)	Include in 5 Year Plan?
Residential					
Essential Plumbing Assistance	$0.68/kL (HWC) $0.68/kL (societal)	Short-run	At all times	50 households	Y – 2023-24 results were marginal but included and will be assessed next year
Leak Repair Assistance Rebate	$0.84/kL (HWC) $1.01/kL (societal)	Short-run	When storage level below 70%	500 households	Y and will be funded by discretionary expenditure
DIY Rainwater Tank Tune-Up	$0.04/kL (HWC) $4.48/kL (societal)	Intermediate	When storage level below 60%	400 households	N
Rainwater Tank Repair Assistance Rebate	$3.52/kL (HWC) $6.99/kL (societal)	Intermediate	When storage level below 60%	4,000 households	N
Rainwater Tank Repair Assistance & Retrofit Assistance	$4.81/kL (HWC) $8.02kL (societal)	Intermediate	When storage level below 60%	4,000 households	N
Efficiency Upgrades – Minor Fittings Rebate	$0.48/kL (HWC) $2.72/kL (societal)	Intermediate	When storage level below 70%	3,300 households	N

[8] In the ELWC method, the levelised cost from a societal perspective is compared with the value of water saved (societal levelised costs include those incurred by Hunter Water, program participants and the community). The levelised cost to Hunter Water has been included for transparency purposes.

[9] The life of the project is set by the total length of time that water conservation benefits are expected to be realised from the project investment. In the ELWC method, water conservation projects with a life of 6 to 14 years are compared with the 'intermediate' value of water saved. The intermediate value of water saved is a linear interpolation between the short-run value of water (which is based on the prevailing water storage level) and the long-run value of water saved ($2.89/kL in $2024-25). The short-run value of water when the storage level is greater than 79% is $0.75/kL ($2024-25), when at 70-79% water storage level it is $0.80/kL ($2024-25), when at 60-69% water storage level it is $4.29/kL ($2024-25) and when at 50-59% water storage level it is $10.06/kL ($2024-25)

Activity / Project	Levelised Cost[8]	Economic Method to Assess Implementation [9]	Economically efficient[2]	Annual Uptake Target (per year)	Include in 5 Year Plan?
Multi-Res Monitoring & Audits	$1.67/kL (HWC) $2.76/kL (societal)	Intermediate	When storage level below 70%	3 sites	N
Community Water Officers	$3.00/kL (HWC) $3.00/kL (societal)	Short-run	When storage level below 70%	720 sites	N
Non-Residential					
Find & Fix	$0.63/kL (HWC) $0.66/kL (societal)	Short-run	At all times	Approx 370 permanent and 30 portable loggers and assumes 10 new leaks identified	Y
Large & Major WEMPs & Audits	$0.23/kL (HWC) $0.36/kL (societal)	Varies	At all times	10 new WEMPS completed	Y
Local Council Water Resilience & Audits	$3.44/kL (HWC) $3.82/kL (societal)	Intermediate	When storage level below 70%	5 sites & 6 councils	N
Targeted Business Support & Awards Program	$0.72/kL (HWC) $3.23/kL (societal)	Intermediate	When storage level below 70%	150 sites	N
Non Revenue Water[10]					
Active leak detection survey – 14 month return frequency	<$0.71/kL	Short-run	Yes	Approximately 4,160 km/yr*	Y
Active leak detection survey – 12 month return frequency	$0.90/kL	Short-run	No	Approximately 5000 km/yr*	Y and will be funded by discretionary expenditure
Pressure management	≤ $2.67/kL	Long-run	Yes	30 sites	Y
Pressure management	≤ $3.00/kL	Long-run	No	35 sites	Y and will be funded by discretionary expenditure
District metering	≤ $2.67/kL	Long-run	Yes	96.5% of network with ongoing refinement	Y
District metering	≤ $3.00/kL	Long-run	No	96.5% of network with additional ongoing refinement	Y and will be funded by discretionary expenditure
Point sources	≤ $2.67/kL	Long-run	Yes	Various	Y
Point sources	≤ $3.00/kL	Long-run	No	Various	Y and will be funded by

[10] In the draft IPART Price Path Submission, Hunter Water has proposed a Non-Revenue Water program that exceeds ELWC based on customer feedback obtained during the Deliberative Forum process. The Non-Revenue Water programs in this table reflect both projects assessed as economically efficient with ELWC (based on the 22/23 price of water when pricing submission preparation was undertaken) as well as the proposed programs that exceed ELWC (Economically efficient = No).

Activity / Project	Levelised Cost[8]	Economic Method to Assess Implementation [9]	Economically efficient[2]	Annual Uptake Target (per year)	Include in 5 Year Plan?
					discretionary expenditure
Alternative Sources					
Lake Macquarie Recycled Water Scheme	>$10/kL	Long-run	N	2.5 Ha of irrigated public green space	Y and will be funded by discretionary expenditure
Edgeworth WWTW recycling	<$2.89/kL	Long-run	N	2.5 Ha of irrigated public green space	Y and will be funded by discretionary expenditure

A total of approximately 6100km of active leak detection was undertaken in 2023/24.

3.1.2 Summary of future programs

Table 3.2 provides a summary of the water conservation initiatives that were assessed as being efficient at a water storage greater than 80%, or that have other important community or customer benefits and have therefore been included in our current five-year program. Should the water storage level fall below 80%, additional initiatives will be added to the program.

Our ELWC for the next five years is 4.4 ML/day. This means that investment to reduce demand beyond this volume is not considered to be economically beneficial (see Appendix A1 for further explanation). This decrease in the ELWC, from the 1 December 2023 Five Year Water Conservation Plan, is due the removal of initiatives that do not meet ELWC and also the Love Water program which should not have been assessed under the ELWC program.

The overall five-year program has the potential to reduce demand by 4.6 ML/day, which is 0.2 ML/day above ELWC. The additional expenditure above ELWC relates to initiatives that support the community's willingness to support additional expenditure to help customers save water.

The forecast indicative expenditure for the 5 year program is provided in Table 3.3.

Table 3.2 Water Conservation Program for 2024-25 to 2028-29 based on the current value of water

Activity / Project	Status[11]	Estimated New Water Savings (ML/year)					TOTAL New estimated Savings (ML)
		2024-25	2025-26	2026-27	2027-28	2028-29	
Residential							
Essential Plumbing Assistance	Ongoing – efficient*	6	6	7	7	7	33
Leak Repair Assistance	Proposed – other drivers	0	88	89	90	91	358
Non-Residential							
Find & Fix	Ongoing - efficient	200	200	200	200	200	1000
Large and Major WEMPs	Ongoing - efficient	200	200	200	100	100	800
Non Revenue Water							
Active leak detection	Ongoing - efficient	806	806	750	750	750	3862
Pressure management	Ongoing - efficient	40	268	523	80	0	910
District metering	Ongoing - efficient	45	414	437	115	91	1102
Point sources	Ongoing - efficient	0	60	63	63	63	248
Alternative Sources							
Lake Macquarie Reuse Scheme	Proposed – other drivers	0	9	9	9	9	36
Edgeworth WWTW Recycling	Ongoing- efficient	0	26	26	26	26	104
Research and Development							
BASIX Optimisation	Feasibility Study	Not applicable					
Total possible ELWC water savings (ML)		1297	1980	2206	1341	1237	7983
Total potential water savings (ML)		1297	2051	2278	1414	1311	8332
						ELWC (ML/day)	**4.4**
						Total potential (ML/day)	**4.6**

* Further assessment to occur prior to the next 5-year water conservation plan

[11] Total storage level was 85.6% as of November 2024 so all activities included in the current 5 year program were assessed against the value of water for storage level >79%. Some activities were not assessed as efficient but were included based on other drivers.

Table 3.3 Water Conservation Program Indicative Expenditure for 2024-25 to 2028-29

Activity / Project	Status[12]	Forecast Indicative Expenditure ($M/year)					
		2024-25	2025-26	2026-27	2027-28	2028-29	TOTAL
Residential							
Essential Plumbing Assistance	Ongoing – efficient*	0.02	0.17	0.17	0.17	0.17	0.71
Leak Repair Assistance	Proposed – other drivers	0.00	0.17	0.17	0.17	0.17	0.68
Love Water	Ongoing – other drivers	0.52	0.66	0.66	0.66	0.66	3.15
Non-Residential							
Find & Fix	Ongoing - efficient	0.24	0.39	0.39	0.39	0.39	1.79
Large and Major WEMPs	Ongoing - efficient	0.17	0.43	0.43	0.43	0.43	1.88
Non Revenue Water							
Active leak detection	Ongoing - efficient	0.70	0.70	0.70	0.70	0.70	3.50
Pressure management	Ongoing - efficient	0.0	5.00	1.50	1.00	1.50	9.00
District metering	Ongoing - efficient	4.80	0.70	1.00	1.00	1.00	8.50
Point sources	Ongoing - efficient	0.00	0.80	0.80	0.80	0.60	3.00
Alternative Sources							
Lake Macquarie Reuse Scheme	Proposed – other drivers	0.02	0.02	0.02	0.02	0.02	0.10
Edgeworth WWTW Recycling	Ongoing- efficient	0.02	0.02	0.02	0.02	0.02	0.10
Research and Development		0.26	0.21	0.21	0.21	0.21	1.11
TOTAL EXPENDITURE		**6.76**	**9.27**	**6.07**	**5.57**	**5.87**	**33.52**

3.2 Water Conservation Initiatives considered for inclusion in the 5-year plan

Projects and activities considered in the 5-year water conservation plan are detailed below.

3.2.1 Residential

Essential Plumbing Assistance (included)

This initiative helps customers facing financial stress with the cost of essential plumbing repairs to their property. These repairs often relate to leaking or broken taps, toilets or pipes. Assisting customers with these repairs, not only reduces water loss but also limits water usage charges on the account and helps to minimise the customer's debt and maintain long-term payment of water bills.

The plumbing assistance is provided reactively in response to customers who are at risk of non-payment of bills and ongoing debt due to financial stress. Upon assessing financial circumstances

[12] Total storage level was 85.6% as of November 2024 so all activities included in the current 5 year program were assessed against the value of water for storage level >79%. Some activities were not assessed as efficient but were included based on other drivers.

and identifying the potential for leaks, Hunter Water engages a plumber to provide a free inspection, water audit of the residence, and carry out any minor plumbing repairs such as washer, tap and toilet cistern replacements. Larger repairs are assessed on a case by case basis.

Essential Plumbing Assistance economic efficiency is currently considered to be marginal. However, it also provides a broader community benefit by aiding vulnerable customers, minimising customer debt and additional financial pressure. The program will be assessed further prior to the next 5-year Water Conservation Plan.

Improvements to Leak Notification identified as part of Active Leak Detection (included)

Through Hunter Water's current leak detection work, our contractors regularly identify possible leaks on private property and notify the property owner. We have established processes to notify customers of leaks and will continue to enact this going forward.

We have not forecast any savings associated with this activity however this will considered as part of the next 5-year plan.

High Consumption Monitoring (included)

Processes implemented this year will be continued to identify and notify customers of leaks on their private plumbing using our billing system.

We have not forecast any savings associated with this activity however this will considered as part of the next 5-year plan.

Leak Repair Assistance Rebate (included)

Small internal leaks, of the type identified above, are often overlooked, however the volumes lost can become significant over time. As part of the drought response Hunter Water provided a rebate of up to $500 per property to assist with the plumbing costs associated with repairing or replacing leaking taps, showers, toilets, pipes and tanks. This initiative was in addition to the ongoing Undetected Leak Rebate which provides eligible customers an allowance of up to 50% of the increase in water usage that occurs due to a hidden leak.

The Leak Repair Assistance drought response program ended on 30 June 2020. Learnings from this initiative can be used to design a similar scheme with a smaller rebate being offered. When evaluated using the ELWC methodology and the average costs observed during the drought program, Leak Repair Assistance is only economically efficient when the water storage level is less than 70%.

Depending on the scheme implemented, this assistance program may prove to be the most economically efficient option to help customers save water. This program has therefore been included in the current five year program and will be confirmed in the next Water Conservation Plan.

Efficiency Upgrades (not included)

Replacing older shower heads, taps, toilets and washing machines with more efficient fittings or appliances or installing a pool cover can reduce household consumption by around 40 kilolitres per year.[13] Two different levels of efficiency rebate schemes were assessed.

[13] Based on an increase from 3 to 4 star WELS rating and average usage patterns, pool sizes and evaporation rates.

1. *Minor Fittings Efficiency Upgrades* would provide property owners with a rebate where it is demonstrated that older inefficient showers, taps and toilets have been upgraded or replaced by a qualified plumber. This rebate scheme was assessed as economically efficient when the water storage level is less than 70%.
2. *Major Items Efficiency Upgrades* would provide households with a rebate where it is demonstrated that an inefficient washing machine has been replaced by a machine with a 4.5 or higher WELS star rating, or an older toilet has been replaced with a 4 star or higher model, or a pool cover has been purchased and installed. This rebate scheme was assessed as economically efficient when the water storage level is less than 60%.

Minor Fittings Efficiency Upgrades are only economically efficient when the water storage level is less than 70%. It is therefore not included in the current five year program.

Carefully targeted appliance upgrades like the DCCEEW washing machine pilot may provide greater demand reductions at a lower cost than the approach assessed against ELWC. Therefore, while an appliance upgrade or pool cover rebate initiative has not been included in the current five year program, opportunities to fund or collaborate on such initiatives will be assessed on their merits as they arise.

Rainwater Tank Repairs & Retrofits (not included)

It is estimated that around 17 per cent of the households serviced by Hunter Water have rainwater tanks installed. Studies have found that the water supplied by rainwater tanks can reduce mains water needs by around 42 kL per year (20 to 25 per cent), but only 65 per cent of rainwater tanks are functional due to design and maintenance issues.[14]

Hunter Water carried out a Tank Tune-Up pilot in 2019, where customers in selected suburbs were offered plumbing audits of their rainwater tank systems. We found similar failure rates to those previously reported and identified particular trends in failure modes. Using this information along with the associated maintenance, repair and installation costs, three different rainwater tank initiatives were assessed using the ELWC methodology.

1. A *DIY Rainwater Tank Tune-Up* which involves Hunter Water preparing and regularly promoting a DIY tank inspection and maintenance regime with customers engaging a qualified plumber or electrician to diagnose or repair more complex issues. We already provide guidance on our website (https://www.hunterwater.com.au/home-and-business/information-for-homes/how-to-love-water/rainwater-tanks) however once the full costs of repair are included it was found that additional investment in this initiative is only economically efficient when the water storage level is less than 60%.
2. *A Rainwater Tank Repair Assistance Rebate* where customers are able to claim a portion of the costs associated with engaging a suitably qualified tradesperson to carry out maintenance or repairs on their rainwater tank system was also assessed as being economically efficient when the water storage level is less than 60%.
3. An expanded *Rainwater Tank Repair Assistance & Retrofit Rebate* which provides financial assistance for repairs and the retrofitting of a rainwater tank system in established homes was found to be economically efficient only when the water storage level is less than 60%.

These initiatives have therefore not been included in the current five year program, however further investigation into opportunities for improved tank design are being pursued as part of a BASIX review. Rainwater tanks also provide potential benefit associated with flood mitigation and stormwater quality.

[14] Retamal M, Mukheibir P, Schlunke A, & Prentice E., 2018 Work Package 4: Rainwater, Report prepared by The Institute for Sustainable Futures (University of Technology Sydney) for the Hunter Water Corporation.

Multi-Residential Dwellings (not included)

Hunter Water has around 30,000 multi-residential customers (e.g. apartments, villa complexes and over 55's lifestyle villages) in our area of operations. These customers often only have a single water meter for the whole site. There is therefore little incentive for each apartment or dwelling to save water by taking actions like repairing plumbing faults because the usages charges are pooled and leaks in common areas are often overlooked.

We considered a similar program to that offered by Sydney Water, whereby strata buildings with high water use are offered plumber audit and repair services and the strata body pays no upfront costs, instead repaying costs with the savings achieved. That is, the water bill of the account is held static until the costs of the service are recovered.[15] On further investigation we found that the number and style of multi-residential sites in our region would not support this kind of scheme.

Instead, a simpler and more targeted program of leak monitoring and water efficiency audits for large multi-residential sites was assessed. It was found to be economically efficient only when the water storage level is less than 70% and therefore has not been included in the current five year program.

Love Water (included)

Our Love Water campaign will continue to provide a strong foundation for our water conservation messaging that unites all our communication and engagement activities as we aim to achieve water conservation goals together with our customers and community.

Our current Love Water campaign was launched in October 2024 and has been developed with a strategic approach to drive behaviour change in water use and promote saving water in any weather. It aims to achieve this through the targeted placement of messaging across traditional and digital media channels using technology that adapts to changing weather forecasts in real time. The campaign message taps into the popular Australian pastime of discussing the weather and is comedic in its delivery, with humour key to the campaign's execution as a tool to deliver our message and ensure it resonates with target audiences in an engaging way.

It is difficult to estimate the direct and indirect contribution communications and engagement campaigns make towards changing customer water use behaviours because of the influence of broader social and environmental factors and the gap between self-reported and actual behaviours and intentions. This initiative has been included in the current five-year program because there are already established, high levels of brand and message awareness and recognition among our customers. Our Love Water campaign provides foundational messaging for all water conservation initiatives and helps to maintain the demand reduction momentum gained during the 2019-2020 drought.

Community Water Officers (not included)

There are existing processes in place to advise customers on Smart Water Choices, respond to breach notifications, exemption requests, conduct residential leakage investigations, and address non-compliance issues should they arise. However, an ongoing Community Water Officer (CWO) is not justified and is rather only used during drought periods as part of our Drought Response Plan.

[15] Sydney Water, 2017-18 Water Conservation Report, p. 11.

3.2.2 Non-Residential

Find & Fix (included)

Water loss due to leaking pipes and fittings or malfunctioning valves can be significant, particularly on large or complex sites. The water loss may be hidden from sight or be unnoticed as it discharges to sewer or stormwater and because it can slowly build up over time it may have no sudden or obvious bill impact. Data loggers can be added to water meters to collect real time information on the volume of water flowing into a customer site. This information can then be used to identify unusual flow patterns that indicate potential water loss on the premises (e.g. night flows when site is closed or gradual upward trend). The loggers also provide daily flow patterns to assist the site users with understanding how they use water. Due to the increase in data received from almost 400 data loggers Hunter Water is trialing an internal purpose-built automated data analytics tool (AQUO) to help monitor and set alarms for leakage and zero usage.

Under the Find & Fix initiative, Hunter Water has installed permanent data loggers on the water meters of large customer sites and assists with data monitoring and alarm set ups. Currently there is around 360 permanent loggers, and these will remain. Around thirty temporary loggers are also available to monitor and investigate smaller, complex sites where a leak is suspected but is not visible. In some cases, follow up technical advice is provided to assist the customer with pinpointing the exact location of a leak so that they can carry out repairs. It is estimated that around 10 leaks will be found each year.

An assessment of the Find & Fix scheme, using data from existing installations and interventions, found that it is economically efficient under all water storage conditions. It has therefore been included in the five-year water conservation program.

Water Efficiency Management Plans (included)

As part of the LHWSP, large non-residential customers (those with sites consuming more than 10 megalitres per year) are required to prepare a WEMP.

Depending on the site, a WEMP can involve a walk through or a detailed assessment. The categorisation is based on discussions with the customer and experience of Hunter water staff. The detailed WEMP identifies sub-metering opportunities and provides a breakdown of usage across the site, opportunities to reduce the use of drinking water through the implementation of efficiency measures or use of an alternative water supply.

Hunter Water will continue to work with large and major water customers on the preparation of WEMPs. There are 220 large and major customers and to date 75 WEMPs have been completed. As we work with customers consuming smaller volumes of water, the savings have been diminishing. This has been considered in the assessment and the program is still economically efficient at all water storage levels. Going forward we will continue to complete 10 WEMPs a year.

Local Council Water Resilience & Audits (not included)

There are six local councils in Hunter Water's area of operations. Collectively they consume around 1.6 gigalitres of water per year across more than 3,000 sites. These sites include public pools and parks, sports fields, holiday parks, waste management centres and works depots. The spread and wide variety of water use across these locations make it challenging to identify easily implemented water saving initiatives. Specialised water audits targeting specific types of sites or end uses can, however, assist councils with benchmarking and preparation of water efficiency investment programs. Best practice guides that promote water efficient design, construction, operation and maintenance of council assets will also be developed where appropriate.

The use of drinking water to irrigate public parks and sports fields is limited under Level 1 and Level 2 water restrictions and banned under Level 3 water restrictions. In other jurisdictions, this restriction

on irrigation was found to have a significant and long-lasting impact on community liveability outcomes during drought. Assisting councils to improve the resilience of these facilities can both reduce the volume of drinking water currently used for irrigation and ensure that the social impact of a drought is reduced. We will also be working with Council on their drought response plans.

An initiative that includes council targeted irrigation and facilities audits and support for business case development and external funding submissions for water conservation initiatives is proposed, along with ongoing collaboration on the development of alternative water source opportunities (e.g. recycled water or stormwater). An assessment of the costs and benefits of council site audits only found them to be economically efficient when the water storage level is less than 70%, therefore they are not currently included in the five-year water conservation program. We are however working with Councils to develop water resilience plans to improve our response should we enter drought.

Schools Program (included)

The 250 schools located in Hunter Water's area of operations consume around 570 megalitres of water per year. A previous initiative (Leakage in Schools Program) where Hunter Water assisted interested schools with the installation of data loggers on their water meters had mixed success, with some schools embracing it as part of their asset management program while others only using the information for a limited period of time. Any future data logger installations at school sites will be carried out under the Find & Fix Program.

Hunter Water has committed to locally support programs being trialled statewide by the DCCEEW to improve students' understanding about water efficiency and design ways to support their schools in reducing their water consumption. These programs will be developed by DCCEEW and implemented by DoE Awabakal Environmental and Zoo Education Centre (EZEC) teachers. Once the initial programs have been implemented, Hunter Water will provide local resources for the ongoing education of engaged schools. This initiative has the potential to lead to long term embedded behaviour change, thereby contributing to the LHWSP target. It is therefore included in the current five-year program.

Our education programs will continue to engage with schools by offering a variety of incursions, excursions and online resources. Offering a flexible approach allows us to increase our reach and be agile to the changing needs of schools. Students may engage with Hunter Water multiple times throughout the school career and increase their knowledge of water conservation and ways to implement increasingly complex water efficient practices.

Targeted Business Support & Awards Program (included)

Hunter Water supplies drinking water to more than 12,000 small to medium non-residential customers (those consuming less than 10 megalitres per year). These customers range from hairdressers to cafes and from landscapers and car washes to office-based businesses. The type of end uses vary greatly along with the scale of the potential water savings, so designing practical and cost-effective water conservation initiatives to support these customers is quite difficult.

Specialised audits and rebate schemes that target particular industries or end uses have been assessed as being economically efficient when the water storage level is less than 70% and have therefore not been included in the current five-year program. Further customer segmentation, industry benchmarking and collaboration with key stakeholders is being explored to support the potential future development of niche end use programs.

3.2.3 Reducing Hunter Water leakage

Hunter Water owns approximately 5,300km's of watermains and our current program of leakage work is forecast to achieve a NRW volume of 6.8 GL (leakage of 50 L/connection/day) by June

2025. It is currently proposed for a continuing NRW program of work that is forecast to reduce NRW by an additional 0.8 GL (leakage to <50 L/connection/day) by June 2030. In order to achieve this a range of works will be undertaken as detailed below.

Leak Detection (included)

Each year, our contractors physically walk and check all of our network. Reducing water lost to leaks is one of our highest maintenance priorities. We use 'listening equipment' to identify hidden leaks and water escaping into the ground, which otherwise may not be found. Around 30 new leaks are found each week. A major benefit of the program is finding small leaks, before they get bigger. Large leaks can be inconvenient for our customers due to water supply interruptions and also potential damage to their property.

A leak detection survey covering approximately 4,160 kilometres per year has been assessed as economically efficient at full storage levels. However, a rate of 5,000 kilometres per year has been proposed as an outcome of the Deliberative Forum. A higher rate is temporarily being sustained in response to significantly higher network leakage levels and will be maintained until performance stabilises.

Our customers know how important it is for us to find and fix leaks and save precious water. About 150 customers contact us each week to report a leak they've found. We respond quickly to every report and prioritise these repairs along with the leaks identified by our contractors.

As our district metered area program expands it is anticipated that our manual survey of water mains for leaks will be able to be optimised.

Pressure management (included)

High water pressure in some areas of our system contributes to water main leaks and breaks, and excessive pressure reduces the life of our assets and equipment. Our Operating Licence states we need to provide customers with a minimum pressure of 20 metres, but some parts of our network have water main pressure greater than 100 metres. Pressure management involves the installation of automated pressure reducing valves to reduce the pressure in the water network and customer fittings, thereby reducing the internal stress and reducing either the quantity of leaks/breaks or the volume lost from leaks/breaks. In the current price period, we have an approved program of works to address unnecessarily high pressure in 23 areas of our network.

An additional 12 areas are proposed for completion in the next price period. Pressure management at these new locations has been assessed in accordance with ELWC including the outcomes of the Deliberative Forum and are consistent with a long-run value of water of $3.00/kL.

Reducing water pressure extends the life of our water mains and equipment, reduces leaks and water main breaks which inconvenience customers.

District metering (included)

District metering involves installing network flowmeters and zone valves to segment the network into smaller 'districts'. Water movement in each district is then monitored and analysed, and any increased water use may indicate a leak in that district. Dividing the network into segments means we can identify and repair leaks more quickly, which reduces costs and customer interruptions.

Hunter Water currently has 83 district metered areas with telemetered flow monitoring, which represents 54 per cent of the network. The district meter outputs are incorporated into a software program called Takadu, which undertakes hourly monitoring and analysis of system performance changes. In the current price path we have an approved program of works to increase the number of districted metered areas so that it covers 96.5 per cent of the network. A continuing program to refine the performance of district metering has been proposed for the next price period involving improving area configuration and utilising technology including acoustic and pressure monitoring.

The ongoing work was assessed in accordance with ELWC and the outcomes of the Deliberative Forum and is consistent with a long-run value of water of $3.00/kL.

Point sources (included)

This important program fixes water lost, or likely to be lost in the near future, at our major assets, including reservoirs and trunk water mains. A continuing program of point source repair has been proposed for the next price period assessed in accordance with ELWC and the outcomes of the Deliberative Forum and is consistent with a long run value of $3.00/kL.

The explicit projects for delivery are still to be determined but funding has been included in the pricing submission.

Other works (included)

There are a number of other ongoing works that support water loss management but are justified through other drivers and include:

- Water main replacement program – the ongoing replacement of reticulation mains with a history of multiple breaks or leaks recorded. The replacement of water mains is primarily driven by asset lifecycle costs, however the value of the water lost through leaks and breaks is also taken into consideration.
- Water service replacement program – the ongoing replacement of service mains (pipe located between the reticulation main and customer meters) that have previously failed. The replacement of water services is primarily driven by asset lifecycle costs, however the value of the water lost through leaks and breaks is also taken into consideration.
- We will continue to repair break as they are reported. They are prioritised based on their size and impact on customers.

3.2.4 Alternative sources (included)

The LHWSP identified a preferred portfolio of options for recycled water (for irrigation and industrial use) and stormwater harvesting. Up to 1,300ML/yr of additional alternative water supply could be delivered, offsetting drinking water demands for industrial and irrigation uses.

In 2023 and 2024, we connected with our community through a deliberative forum process to establish the objectives we should target in our recycled water programs. As a result, we will continue to explore recycled water options as part of servicing the water and wastewater needs of our customers and we may invest in recycled water schemes if it is the least cost way to do so. We will also continue to provide advice to non-residential customers who want to pursue their own recycled water opportunities.

Development regulations and approvals are set by NSW Department of Planning, Housing and Infrastructure and local governments. While Hunter Water does not have authority to impose conditions on new developments that require them to implement recycled water, we will continue to work with NSW Government, local councils and regional stakeholders to improve the integration of land use planning and water management and seek to remove barriers that impede the use of recycled water.

The development of the Lake Macquarie recycled water scheme is underway and will deliver recycled water for the irrigation of 2.5 Ha of sporting fields in Edgeworth. The scheme will provide a resilient water supply of 9 ML/year commencing in the 2024-25 financial year. Opportunities to expand this scheme or implement new schemes will be considered if there is support from the community and greenspace providers to do so.

Since the development of the LHWSP a total of 641ML/yr (1,300ML/yr target) of drinking water has been offset by implementing new recycled water opportunities.

We will continue to investigate the use of alternative sources at our wastewater treatment works and implement solutions where they are the least cost approach. A number of sites have been investigated and assessed against ELWC. In addition to the implementation of recycled water supplies at three treatment plants over the past two years, the following works are currently underway or under investigation:

- Lake Macquarie recycled water scheme is in the construction phase and will save 9ML/yr when the project is implemented in 2025.
- Edgeworth WWTW onsite reuse is in the construction phase and will save 26ML/y when the project is implemented in 2025.
- Investigations for up to 400ML/yr from expanding existing recycled water schemes to new customers and increased usage from existing customer sand new customers.
- Investigation for large scale recycled water to support the energy transition, including the production of hydrogen.

3.2.5 Integrated Water Management (included)

There are opportunities in 2024-25 for greater involvement of DCCEEW Water and DPHI to become more involved in the IWCM working group. This may also be a mechanism to ensure that state government agencies have the opportunity to input to the sustainability strategies of local Councils.

An ongoing program of work is underway within DCCEEW Water to scope the authorisation of stormwater harvesting in NSW. This work will review policy and regulatory options for stormwater harvesting in NSW to support utilities in diversification of their supply sources. Progress in this area may support the delivery of more projects in the future, in particular in urban areas where stormwater harvesting can provide benefits for waterway health and urban amenity.

3.3 Research and Development

Projects or activities that aim to build knowledge or capacity are not assessed using the ELWC methodology. These initiatives may lead to future water savings however quantifying them is difficult at this point.

Evaporation management (included)

We will continue to keep abreast of research and development in evaporation reduction of raw water sources, including the potential for future floating solar on Grahamstown Dam.

Water Efficiency Upgrades on social housing properties (not included)

In 2021-22 a partnership between NSW Land and Housing Corporation (LAHC) and Hunter Water delivered water efficiency upgrades and water leak repairs to more than 1,300 social housing properties. Tenants in these properties had more efficient toilets, taps and shower heads installed, helping them to reduce their water and electricity costs. LAHC will be assessing the benefits of this trial in order to better inform potential future work. Although this is not included in the 5-year program, Hunter Water is open to participating if the opportunity presents and the scheme is economically efficient.

Washing Machine Trial (not included)

Hunter Water collaborated with NSW Department of Planning and Environment on a trial which provided social housing tenants the opportunity of purchasing a new highly efficient washing machine at a heavily discounted price. Participants in the trial were able to replace inefficient top

loaders with energy and water efficient front loaders helping them save money on water, electricity and detergent. The trial commenced 2021-22 and concluded 2022-23. LAHC will be assessing the benefits of this trial in order to better inform potential future. Although this is not included in the 5-year program, Hunter Water is open to participating if the opportunity presents and the scheme is economically efficient.

End User Study (included)

There is uncertainty regarding the effectiveness of initiatives that have yet to be implemented. It will require an iterative process to identify the type and level of incentive required to achieve increased uptake of water efficient behaviours, fittings and appliances. An end-user study and further monitoring and research are proposed to improve the understanding of actual versus theoretical demand reductions achieved.

Hunter Water is currently preparing to undertake an investigation to better understand the drivers of residential water demand. This investigation was last completed in 2012 and it is believed that there is much to learn from redoing this study. The outputs of this study can then be used to better inform future water conservation programs and our demand forecasting.

Continuous Improvement and Incentives (included)

Review of assumptions and data feeding into the design of water efficiency programs is underway. As part of this review options and mechanisms to support and incentivise customers to upgrade to more efficient appliances or make their businesses more water efficient may be considered.

Hunter Water is in the process of procuring 3,000 digital meters for deployment predominantly at residential customers. These meters will produce data at a sufficient short time step and accuracy to help inform:

- Improved water balance and leakage assessments in the treated water network
- Supporting delivery of the residential end use study
- Improved customer insights to understand the drivers behind water usage
- An increased cost signal for multi-residential dwellings which are not currently metered.

APPENDIX A.1- ELWC METHODOLOGY FOR WATER TREATMENT AND TRANSMISSION

The ELWC methodology is based on a cost-benefit analysis framework where the costs and benefits are assessed in marginal terms from a societal perspective.

A water conservation measure is considered to be economically viable if the benefits are at least equal to the costs.

- The benefits are assessed in terms of the value of water conserved
- The costs are assessed in terms of the levelised cost of implementing the water conservation measure, and
- The costs and benefits are expressed as present value of dollars per kilolitre of water.

That is, when the cost to society of a water conservation measure is less than the value of water it is expected to save, it is economically viable.

The value of water conserved is based on the marginal cost. Marginal cost is the cost incurred in the production of one extra unit of water supply.

- In the short-run, this cost is usually the operating cost associated with, for example, the additional pumping and chemical treatment of supplying an extra unit of water through the existing network.
- In the long-run all inputs are considered variable and therefore this cost is the cost associated with all actions required to bring supply and demand into balance, including capital expenditure on source augmentations (if necessary).

The value of water conserved depends on the timing and durability characteristics of the water conservation measures being assessed (i.e. short or long-term).

For conservation measures with short-term benefits, the short-run value of water reflects the short-run marginal cost including direct operating costs, the social costs of water restrictions, and the alternative drought measures and supply options.

For conservation measures with long term benefits, the long-run value of water reflects the long-run marginal cost plus an option value. *"Option value refers to the value of delaying an irreversible commitment to an investment, where it increases the likelihood of delaying or avoiding the need for the investment, or that the cost of the investment would reduce - eg, as a result of technological progress"*.[16]

The ELWC is calculated by adding the volume of water conserved from all new water conservation measures that are assessed as being economically viable. That is, our investment in new water conservation activities could increase (depending on available projects and funding) until the marginal benefit of saving an extra unit of water is just equal to the marginal cost of supplying an extra unit of water. The economic level of investment is achieved when the marginal values are equal. This can be explained with the assistance of a diagram (see Figure A1.1).

[16] IPART, 2019, Review of pricing arrangements for recycled water and related services, page 37.

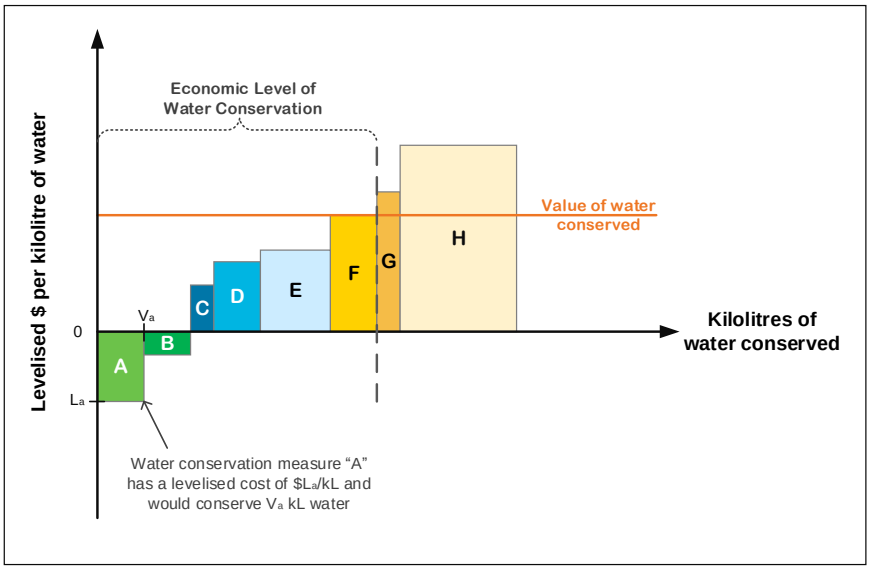


Figure A1.1 Conceptual diagram showing calculation of the Economic Level of Water Conservation

The horizontal axis represents the volume of water saved through implementing water conservation measures, while the vertical axis represents the cost per kilolitre. Each new water conservation measure (e.g. A to H) can be characterised by an estimated *volume of water conserved*, which is shown by the horizontal width of each rectangle, and a *levelised cost*, shown by the height of each rectangle. The levelised cost of a water conservation measure can be negative (measures A and B) or positive (measures C to H). A negative levelised cost means the water conversation measure results in a levelised benefit (even before considering the value of water conserved). For example, in the diagram water conservation measures A and B have negative levelised costs and are shown below the horizontal axis. Measure A could be a water efficient showerhead giveaway to customers that enables the customer to save more money on electricity costs for water heating than the financial cost to Hunter Water to buy the showerheads.

In this conceptual example, the projects are ordered by increasing levelised cost from left to right. That is, projects towards the left of the figure are more economically beneficial than those towards the right of the figure. Adopting this convention, the shape formed by the levelised costs of all measures assessed is similar to a marginal cost curve - the cost to save one kilolitre of water rises as we try to save more and more water.

The orange horizontal straight line - "value of water conserved" - reflects the marginal costs of supplying water. It is assumed to be constant at a given point in time, under specific assumptions about balancing supply and demand in the short and long terms.

Using the ELWC methodology, all water conservation measures with a levelised cost less than or equal to the value of water are considered to be economically viable. The volume of water that could be saved if Hunter Water implemented all of these measures is the Economic Level of Water Conservation. In Figure A1.1, measures A to F are economically viable. In other words, the vertical height of the rectangles for A to F are all no taller than the orange horizontal line representing the value of water conserved. Reducing water use any further (e.g. implementing measures G and H) would not be economically beneficial.

The ELWC is a forward-looking methodology. That is, only new potential water conservation projects are assessed using the ELWC methodology. We do not assess research, pilot trials or initiatives to drive behavioural change using our ELWC methodology as these types of projects aim to provide us with better information to use in the ELWC methodology, for example to calculate the project costs and water savings.

APPENDIX A.2 – STRATEGIC ASSET MANAGEMENT PLAN

We identify new options for water conservation through Hunter Water's Strategic Asset Management Plan. The Plan is the delivery mechanism for Hunter Water's overarching Asset Management Strategy.

The Strategic Asset Management Plan (SAMP) is an overarching document describing how services are to be provided through continual planning, delivery and management of assets. The SAMP outlines how Hunter Water's strategic objectives are fed into asset management objectives, ensuring the assets' performance both delivers and adapts to the required level of service at an acceptable level of risk and cost.

The SAMP outlines the tasks required for identifying existing and future community service objectives, then planning and delivering those objectives through the asset management functions across the life cycle of the varied asset types. The SAMP articulates the processes and the documentation related to managing assets as governed in the Asset Management Policy.

The SAMP is reviewed and updated periodically to align with Hunter Water's strategic business planning cycle.

In our planning and asset management activities Hunter Water recognises the importance of water conservation in:

- Water resource availability and supply augmentation
- Supply costs
- Infrastructure capacity requirements; and
- Maintenance activity levels and scheduling.

New water conservation options are compared using the ELWC methodology (described in A.1). Programs and projects are selected for funding and implementation in the same manner as other operating expenditure and capital expenditure proposal, that is through robust internal governance process and IPART price reviews.

APPENDIX B – OPERATING LICENCE REQUIREMENTS

Part 2 Water conservation and water planning

12 Water conservation

(1) Hunter Water must maintain and implement a water conservation work program in relation to Water Storage and Transmission in accordance with the Water Conservation Strategy.

(2) Hunter Water must also:

(a) maintain a water conservation work program for Water Treatment and Transmission consistent with the Current Economic Method; and

(b) implement water conservation measures for Water Treatment and Transmission that have been assessed as economic under the Current Economic Method.

(3) Clauses 12(1) and 12(2) apply until a 5-year Water Conservation Plan is developed and submitted to DPE and IPART under clause 12(4).

[Note: Hunter Water's water conservation work program for Water Storage and Transmission, Water Treatment and Transmission and water conservation measures will be replaced with a new 5-year Water Conservation Plan once the Water Efficiency Framework being developed by the NSW Government is introduced (see clause 12(4).]

(4) Within 12 months of publication of the Water Efficiency Framework being developed by the NSW Government (or such later date approved by IPART in writing), Hunter Water must develop, and submit to DPE and IPART, a water conservation plan for the following 5 years (the **5-year Water Conservation Plan**).

(5) The 5-year Water Conservation Plan must:

(a) include any water conservation work programs for Water Storage and Transmission and for Water Treatment and Transmission;

(b) cover water efficiency (including customer behaviour programs), leakage and recycled water;

(c) be consistent with the Water Efficiency Framework;

(d) consider the strategic context provided by the Lower Hunter Water Security Plan;

(e) include details of proposed programs and projects over the life of the plan;

(f) where practical, assess programs and projects against the Current Economic Method; and

(g) be consistent with any written guidance that the Minister provides to Hunter Water.

(6) Each year, by the anniversary of the date referred to in clause 12(4) (or such later date approved by IPART in writing), Hunter Water must:

(a) review and update the 5-year Water Conservation Plan. In reviewing the 5-year Water Conservation Plan, Hunter Water must:

(i) review the activities carried out under the plan over the past year;

(ii) assess its progress towards meeting the overall objectives of the plan; and

(iii) update the plan to ensure its objectives and the requirements of clause 12(5) are still being met; and

(b) submit to DPE and IPART:

(i) a copy of the updated 5-year Water Conservation Plan;

(ii) the outcomes of the annual review and update of the 5-year Water Conservation Plan, including an explanation of any changes made to the plan.

[Note: Hunter Water may submit the updated 5-year Water Conservation Plan required under clause 12(6)(b)(i) and the information required under clause 12(6)(b)(ii) together as one document or as separate documents.]

(7) Hunter Water must implement the 5-year Water Conservation Plan in accordance with the timeframes specified in the 5-year Water Conservation Plan.

[Note: This clause 12(7) requires Hunter Water to implement the most recent 5-year Water Conservation Plan at all times].

APPENDIX C – IPART LETTER ON CHANGES TO THE REPORTING MANUAL

IPART Independent Pricing and Regulatory Tribunal | NSW

Our reference: D24/13086

Contact Christine Allen
T (02) 9290 8412
E christine.allen@ipart.nsw.gov.au

19 June 2024

Mr Darren Cleary
Managing Director
Hunter Water Corporation

via email

Dear Mr Cleary

Hunter Water reporting manual 2022-2027– removing water conservation requirements

We are writing to you to let you know that we will soon be updating the Hunter Water reporting manual 2022-2027 to remove the water conservation reporting requirements contained in section 2.1.1 of the manual.

On 1 December 2023, you provided us with a copy of your 5-year water conservation plan that you developed under clause 12(4) of the Hunter Water operating licence 2022-2027. On 21 December 2023, and then again on 17 April 2024, Hunter Water staff wrote to us requesting that the water conservation reporting requirements in the current reporting manual be removed.

As set out in the operating licence, the water conservation plan replaces your previous water conservation programs under clauses 12(1) and 12(2) of the operating licence. The current water conservation reporting requirements are related to these superseded licence requirements for the water conservation programs. Therefore, they are now largely redundant and we will remove them from the reporting manual.

We do not propose to replace these with new reporting requirements. Clause 12(5) of the operating licence sets out the requirements for Hunter Water's water conservation plan. We consider that the operating licence is the appropriate instrument to include requirements for the water conservation plan and further requirements are not necessary in the reporting manual.

However, to aid transparency, we recommend that you include the information set out below about your water conservation projects and programs when you next update your water conservation plan. Sydney Water will be required under their operating licence to include this information in their water conservation plan for the 2024-2028 Sydney Water operating licence:

1. Assess proposed water conservation programs or projects against the current economic method and identify:
   a. the expected water savings,
   b. the expected costs,
   c. whether it is currently economic and, if it is not, whether it may later become economic, and
   d. if it is not economic, whether it contributes to wider policy objectives.

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2. Explain whether a proposed program or project furthers the licence objectives set out in clause 1(1)(b) of the operating licence,
3. Explain whether Hunter Water has implemented a proposed program or project or is proposing to implement it at a later date or in specific circumstances and how and when Hunter Water will implement it.
4. Explain whether Hunter Water is proposing not to implement a proposed program or project, including the reasons for the decision.

You are due to complete the next annual review and update of your water conservation plan by 1 December 2024, under clause 12(6) of the operating licence. We recommend that you include the above information in your plan during the next review.

To further aid transparency and accountability, we also recommend that you publish your water conservation plan, and all future updates, on your website and make it available on request through your General Enquiry process.

At this stage, we do not propose any other changes to the reporting manual. We will consider recommending changes to the Hunter Water operating licence in the next end-of-term review in 2027.

You can contact Christine Allen, Director, Regulation and Compliance, on 02 9290 8410 if you have any questions or wish to discuss this matter further.

Yours sincerely

19/06/2024

X

Andrew Nicholls PSM
Chief Executive Officer
Signed by: andrew.nicholls@ipart.nsw.gov.au

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