

# Demand Management Plan

2023



**DEMAND MANAGEMENT PLAN (2023) – DOCUMENT CONTROL TABLE**

<b>Revision</b>	<b>Revision Date (from when Revision Applies)</b>	<b>Resolved by Council (date of Council Meeting)</b>
<i>Draft Report (for public exhibition)</i>	28 April 2023	6 June 2023
<i>Final Report</i>	25 September 2023	10 October 2023



**Tamworth Regional Council**

This Demand Management Plan (2023) has been prepared with the support of Beca HunterH2O. This document is a controlled document and therefore subject to review and amendment from time to time.

# DEMAND MANAGEMENT PLAN (2023) SUMMARY

## Overview

This Demand Management Plan (2023) outlines Tamworth Regional Council's (TRC) Demand Management Program and various water conservation and water efficiency initiatives that make up this program.

The fundamental objective of demand management is to encourage efficient and sustainable water use through the adoption of a variety of water efficiency measures. Through the effective implementation of a Demand Management Program, significant reductions in water supply system capital and operating costs can be achieved, along with various environmental and social benefits.

This Demand Management Plan has been developed in association with a Drought Management Plan, which focuses on both the demand and supply side measures that should be employed during drought periods. Consequently, during drought periods there is an overlap between the two plans.

*The Demand Management Plan and all rebates and offers contained within are only applicable to customers connected to the reticulated town water supply systems operated by TRC, including Dungowan Pipeline raw water customers.*

## Context

There are six town water supply systems operated by TRC, including one very large system (Tamworth / Moonbi / Kootingal) with around 20,000 connections, two medium systems (Barraba and Manilla) with around 800 to 1,200 connections each, and three smaller systems (Nundle, Attunga and Bendemeer) each with less than 250 connections. In most of these town water supply systems, residential consumption typically represents around 60% of total consumption and in Tamworth, the meat processing industry accounts for just under half of the total non-residential consumption.

The typical household in Tamworth consumes around 270 kilolitres (kL) per annum, which is around 300 Litres (L) per person per day. Prior to the adoption of the first formal Demand Management Plan in 2007, the average household consumed around 350 kL per annum. There have been significant reductions in household consumption (over 20% reduction) over the past 15 years and this has mostly offset increases in demand due to population growth. Over this time, there has also been significant water consumption reductions achieved in the non-residential sector, including at Council facilities and with the irrigation of parks and gardens.

Between 2016/17 and 2021/22, Council paid out around \$380,000 in financial assistance (over 3,000 rebates) for TRC residents to install more water efficient products – including dual flush toilets, efficient shower heads, swimming pool covers and rainwater tank – and to improve the water efficiency of existing fixtures – including evaporative coolers and taps.

TRC's community awareness and education program has expanded significantly over the last five years, with the 'Let's Thrive' television commercial and waterwise garden booklet, the 2020 Water Sustainability Awards and the 'Sonny the Sustainability Scout' school education program. These important water sustainability education tools are being used in schools and in the wider community to improve awareness and understanding of the need for water efficiency and the benefits of adopting more water efficient practices.

# Demand Management Program

The following revised Demand Management Program has been adopted by Council.

**Table 1 TRC Demand Management Program**

Demand Management Measure	Details	Customers Targeted
Community Awareness Program	<ul style="list-style-type: none"><li>• Continuation and ongoing development of Community Awareness Program, including:<ol style="list-style-type: none"><li>1. Seasonal media advertising campaign</li><li>2. Water efficiency resources, including <i>Let's Thrive</i> waterwise garden booklet</li><li>3. Education stands at shopping centres and shows / events, and community / school education guest speaking</li><li>4. <i>Sonny the Sustainability Scout</i> school education program, including resource kits</li><li>5. Customer water accounts to include comparisons to benchmark usage &amp; water efficiency tips</li><li>6. Evaporative cooler water efficiency education</li><li>7. Commercial / business water efficiency tips</li></ol></li><li>• Maintain strong water conservation signals through the continued use of tiered water usage pricing</li></ul>	All
Water Rebates	<ul style="list-style-type: none"><li>• Up to 50% rebate offered on water savings products installed in a home or business, including:<ul style="list-style-type: none"><li>○ 3-star showerheads &amp; dual flush toilets</li><li>○ Swimming pool covers &amp; backwash recycling system</li><li>○ Rainwater tanks connected to garden and toilet and/or laundry</li><li>○ Greywater treatment and diversion systems</li><li>○ Hot water system diverters</li><li>○ Plumber audits and evaporative cooler servicing</li><li>○ Various commercial cleaning units (business only)</li></ul></li></ul>	Existing houses & businesses
Large User Water Efficiency Assessments	<ul style="list-style-type: none"><li>• Non-residential large user Water Efficiency Assessments</li><li>• Council Water Efficiency Assessments (including high water use buildings and other facilities / assets)</li><li>• Ongoing consultation with large users to review progress towards implementing water efficiency measures</li></ul>	Non-residential large water users

Demand Management Measure	Details	Customers Targeted
<b>Everyday Waterwise Guidelines (previously Permanent Water Conservation Measures)</b>	<p>Everyday waterwise guidelines will continue to be publicised as an integral part of the Community Awareness Program to encourage common sense practices that help save water:</p> <ul style="list-style-type: none"> <li>• <b>Only water the garden before 10 am or after 4 pm.</b> This avoids watering during the hottest part of the day when evaporation is high.</li> <li>• <b>Trigger nozzles to be used on all handheld hoses.</b> Trigger nozzles provide more control over water flow and reduce wastage.</li> <li>• <b>Avoid hosing down hard surfaces, such as concrete, paths and driveways.</b> Use a broom or leaf blower, or if water is required, use a high-pressure cleaner or water efficient nozzle.</li> </ul>	All
<b>Regulation &amp; Planning Controls</b>	<p>The following regulation and planning controls will contribute to water savings over the life of the Program:</p> <ul style="list-style-type: none"> <li>• BASIX</li> <li>• WELS Rating Scheme</li> <li>• Smart Approved WaterMark Program</li> <li>• Tamworth Regional Development Control Plan</li> </ul>	New Residential + New Fittings / Appliances
<b>Water Loss Management</b>	<p>Water Loss Management Program, which includes:</p> <ul style="list-style-type: none"> <li>• Metering of all properties / connections</li> <li>• Installation of automated meter reading (AMR) or 'smart meters' across all properties by 2024</li> <li>• Annual water loss assessment</li> <li>• Periodic inspection of key assets for leaks</li> <li>• Participation in Water Leak Reduction Pilot Program</li> </ul>	All water supply systems
<b>Water Recycling &amp; Potable Substitution</b>	<ul style="list-style-type: none"> <li>• Water recycling and other potable substitution initiatives have previously been implemented or will be implemented over the life of the Program and will further contribute to drinking water savings, including: <ul style="list-style-type: none"> <li>○ Use of recycled backwash plus rainwater at AELEC and nearby sports grounds</li> <li>○ Use of groundwater bores at various parks, reserves and playing fields to replace the use of drinking water for irrigation</li> <li>○ Use of recycled effluent onsite at Westdale WWTP</li> </ul> </li> <li>• Investigation of new opportunities for commercial / industrial water recycling, including advancing the proposed Tamworth Water Purification Facility for industrial reuse.</li> </ul>	

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**Appendix A      Location & Climate**

**Appendix B      Demand Projections**

# 1 INTRODUCTION

Demand management is an essential component of modern water resource planning and management. The implementation of a comprehensive Demand Management Program provides benefits to customers, Council and the environment, including:

- Reduced customer costs due to water savings (lower water and wastewater charges) and energy savings (lower energy charges)
- Reduced long-term costs for providing water due to avoided or delayed water supply infrastructure
- Reduced environmental impacts due to lower water extractions and lower energy usage

This Demand Management Plan has been prepared by Tamworth Regional Council (TRC) to ensure a structured and consistent approach is taken for the promotion of demand management initiatives across the region. The Plan includes Council's Demand Management Program, which includes a range of water conservation and water efficiency measures that Council will be targeting to ensure that future town water demand levels are both efficient and sustainable.

The Plan is only applicable to customers connected to the reticulated water supply systems and some raw water pipelines operated by TRC, which includes systems operated in the following towns:

- Tamworth and Moonbi / Kootingal
- Manilla
- Barraba
- Nundle
- Attunga
- Bendemeer

Management of water supply in NSW is administered by the *Water Management Act 2000*, *Water Act 1912* and *Local Government Act 1993*.

This Plan contains the following sections:

*Section 2* contains a review of historical demands and considers the key influences on demands.

*Section 3* contains a summary of how water is currently used, including a breakdown of demands, benchmarking of demands and water loss estimates.

*Section 4* contains 30-year demand forecasts.

*Section 5* contains a summary of recent water efficiency achievements.

*Section 6* contains a summary of the Demand Management Program along with further details for each demand management measure.

*Section 7* outlines the steps for implementing and monitoring the Demand Management Program.

## 2 HISTORICAL WATER USE

Historical water consumption is influenced by a variety of factors, including:

- Prevailing climatic conditions and climate change (refer to **Appendix A**)
- Residential and non-residential development
- Planning regulations for new developments
- Demand management measures
- Restriction rules during periods of drought
- Living standards, incomes and lifestyle factors.

With most of the above factors influencing demand at any given time, it is difficult to directly attribute changes in historical demand patterns to any one factor. Consequently, a general assessment has been made of the major influences of demand over the last 10 years.

Figure 2-1 shows the annual demand for raw water for Tamworth (including Moonbi/Kootingal) over the last 10 years. Annual demands varied significantly over this period, primarily due to extended dry periods and extended periods of water restrictions, with significant periods of moderate and major restrictions (shown in orange) being applied in 2014/15, 2015/16, 2019/20 and 2020/21. Excluding the years with moderate to major restrictions, annual raw water demand has averaged around 9,200 ML/a.

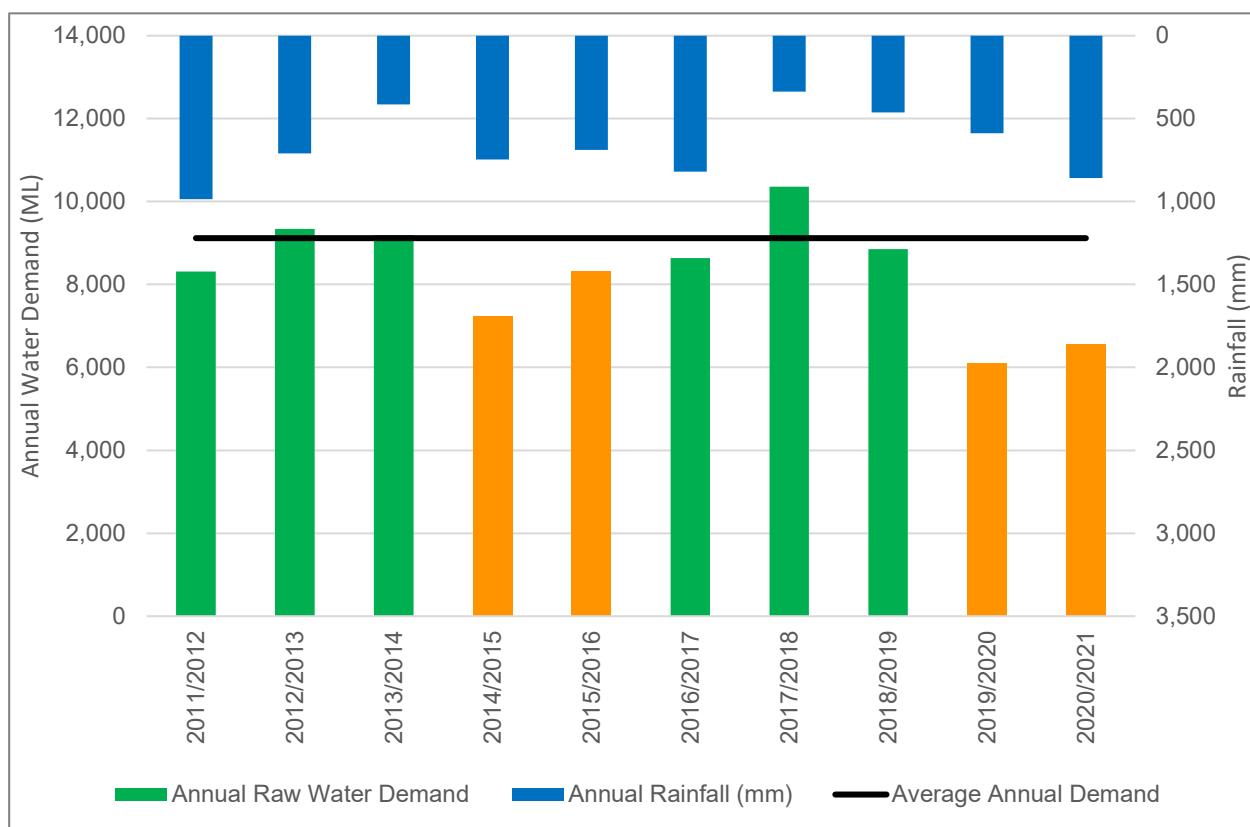


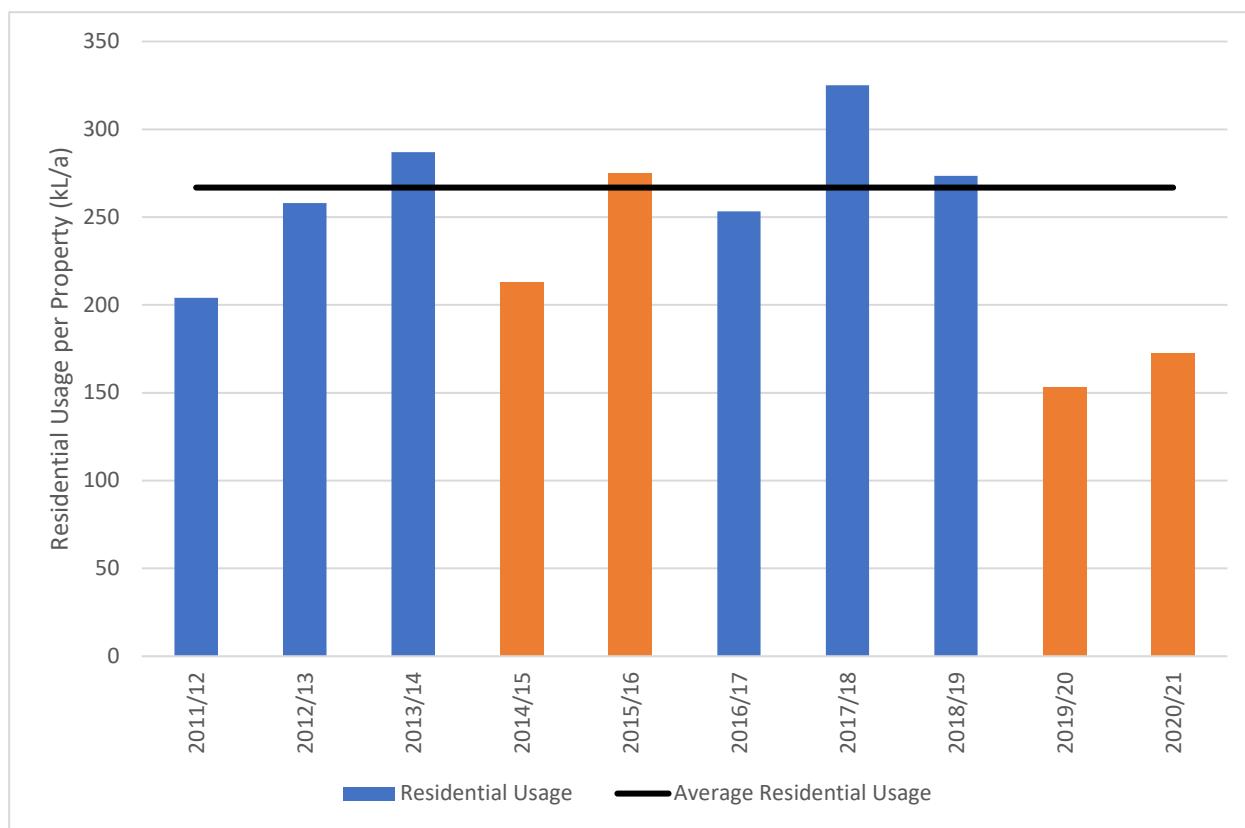
Figure 2-1 Annual Raw Water Demand – Tamworth Water Supply (10 years)<sup>1</sup>

<sup>1</sup> Hunter H2O (2022), *Namoi Regional Town Water Strategy: TRC Demand Assessment*.

Annual demands have not shown a strong correlation with population growth over the last 10 years (which has averaged around 0.9% per annum). This is most likely due to the effects of demand management measures that were in place during this period.

Annual raw water demands show a reasonable correlation with rainfall during periods with either no restrictions or minor restrictions (as shown in Figure 2-1). The highest annual demand (in 2017/18) over the past 10 years coincided with the lowest rainfall year, when considered on a financial/water year basis. Conversely, the lowest annual demand (outside of periods of significant restrictions) occurred in 2011/12, which coincided with the highest rainfall year.

Prior to the introduction of the first formal Demand Management Plan in 2007, Tamworth's average residential usage per property was around 350 kL/a. Since this time, residential usage has reduced significantly, as shown in Figure 2-2. Over the past 10 years, residential usage per property has averaged around 270 kL/a, which is a reduction of over 20% compared to pre-2007 residential demand levels.



**Figure 2-2 Average Annual Residential Usage per Property – Tamworth Water Supply (10 years)**

Prevailing climatic conditions, particularly maximum temperatures and rainfall during summer months, have a significant impact on water consumption – particularly residential outdoor water usage. However, Figure 2-1 and Figure 2-2 both show that during the severe drought conditions that were experienced in 2014/15, 2015/16, 2019/20 and 2020/21 (shown in orange), water restrictions have a major impact on consumption – particularly in 2019/20 when severe water restrictions, including a ban on outdoor watering, were applied the whole year.

### 3 HOW WATER IS CURRENTLY USED

#### 3.1 Demand Categories

The breakdown of water consumption by major demand type for Tamworth water supply system is shown in Figure 3-1. While the majority of water is consumed for residential purposes, commercial and industrial consumption accounts for over one third of water usage, with public, institutional and rural accounting for around 10% (combined). Total metered usage averaged 8,600 ML/a over the three years to 2018/19.

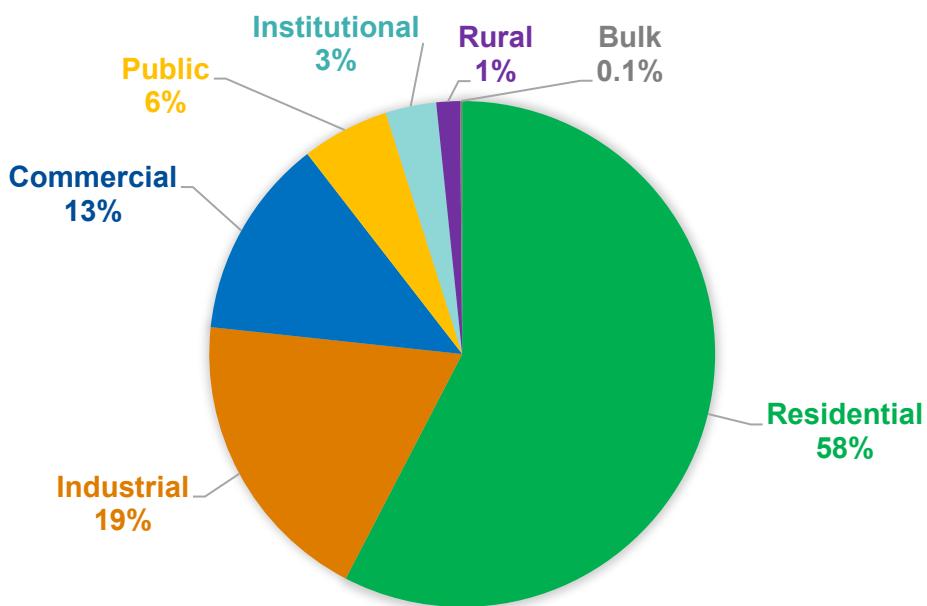


Figure 3-1 Tamworth – Metered Consumption by Major Demand Type (3 year average to 2018/19)<sup>1</sup>

A simplified analysis of metered water consumption by demand category was also undertaken for the remaining small town water supply systems and is included below in Table 3-1. Metered consumption data was averaged over the last five years, excluding years with moderate to severe restrictions.

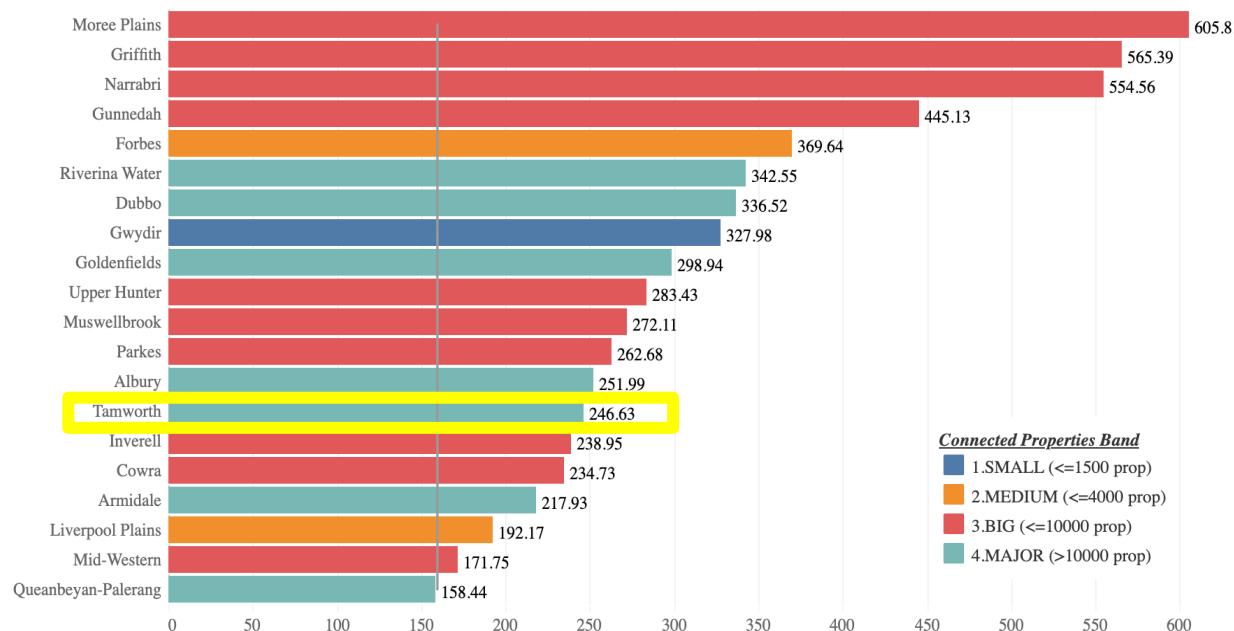
Table 3-1 Small Town Water Supply Systems – Average Metered Consumption<sup>1</sup>

Town Water Supply	Total Metered Consumption (ML/a)	Residential Metered Consumption (ML/a)	Proportion Residential	Residential Consumption per Connection (kL/a)
Manilla	275	182	65%	190
Barraba	187	97	50%	155
Nundle	39	17	45%	115
Attunga	40	26	65%	190
Bendemeer	25	16	65%	130

Residential consumption dominates most small town water supply systems, with average residential consumption significantly lower than residential consumption in Tamworth (see Figure 2-2) and varying between 115 kL/a (per property) in Nundle to 190 kL/a in Manilla and Attunga.

## 3.2 Benchmarking of Residential Consumption

Benchmarking of residential consumption was undertaken using DPE performance data<sup>2</sup> for 2018/19, comparing nearby and larger, inland local government areas (LGA), as shown in Figure 3-2. 2018/19 was the most recent year that was not impacted significantly by periods of major water restrictions (for most councils).



**Figure 3-2 Benchmarking of Average Annual Residential Water Supplied - Potable (kL/property) 2018/19<sup>2</sup>**

TRC average residential usage (for the whole LGA) was around 245 kL/property (see highlighted bar in Figure 3-2). TRC's residential usage compares favourably with other inland Councils in Northern NSW, including Moree Plains, Griffith, Narrabri, Gunnedah, Riverina Water, Dubbo and Albury.

The state median was around 160 kL/property; however, this figure is significantly influenced by the larger, coastal councils. There is a significant difference between coastal and inland climates, particularly annual rainfall figures and maximum summer temperatures, both of which significant influence residential water usage. Inland residential properties can also use significantly more water in summer due to the significant water usage associated with evaporative coolers (see Section 0).

<sup>2</sup> <https://www.industry.nsw.gov.au/water/water-utilities/lwu-performance-monitoring-data>

### 3.3 Residential End-Use

In the absence of local residential end-use metering data to provide a more accurate estimate of end-use consumptions, typical values have been adopted based on end-use studies conducted across Australia. These studies have typically been undertaken by large metropolitan water utilities that were coastal based. However, while external water usage and evaporative coolers usage can differ substantially across Australia, particularly when comparing coastal areas to inland areas, the breakdown of internal usage is generally relatively consistent across water utilities.

The key assumptions used in developing the residential end-use breakdown were:

- Total household usage was assumed to be 270 kL/a
- Internal household usage (excluding evaporating coolers) was assumed to be 150 kL/a (ie 55% of total consumption)
- Internal consumption breakdown was based on typical values from end-use studies across Australia
- Evaporative cooler usage was estimated to be around 20 kL/a per household (on average), based on recent research undertaken by TRC.
- Outdoor water usage (primarily irrigation) was assumed to be the remainder of water usage after accounting for internal usage and evaporative cooler usage.

Figure 3-3 below shows the assumed breakdown of residential end-use that has been adopted for the purposes of assessing demand management options.

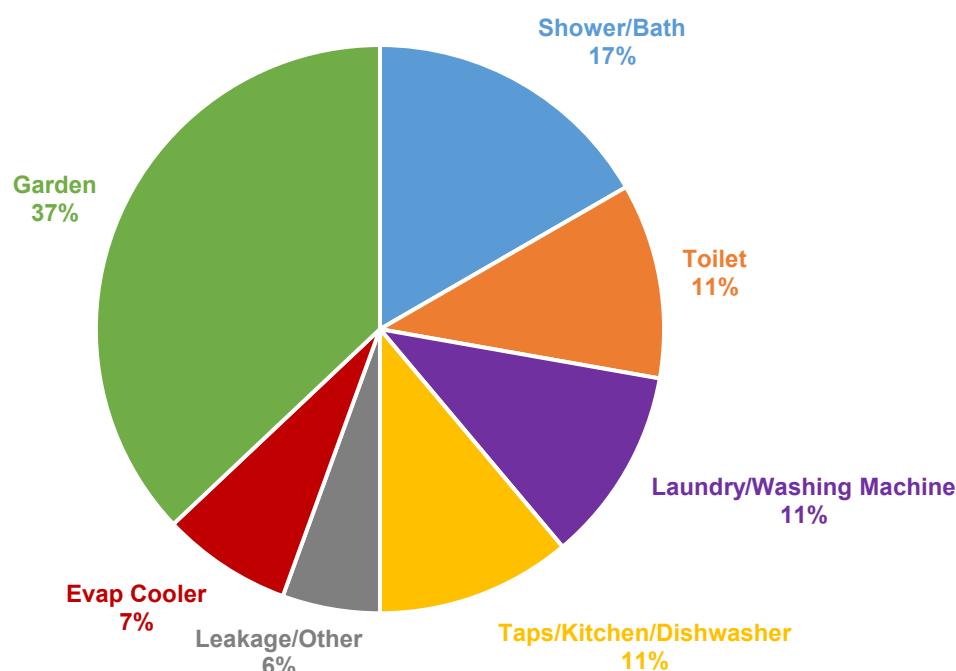


Figure 3-3 End-Use for Residential Properties based on 270 kL/a per household (Estimate Only)

## 3.4 Non-Residential Water Users

Based on an analysis that was undertaken for the Tamworth Emergency Water Supply Plan<sup>3</sup> in 2020, using non-residential metered data from 2018/19, the non-residential properties in Tamworth can be separated into three key types of water users:

- **Major Users** – there are four major users that each have annual usage over 100 ML across a total of six properties/sites (all related to the meat processing industry) and account for around 45% of total non-residential usage.
- **Large Users** – the top 150 water users (less the four major users) make up the large users list, with annual usage typically between 1.4 ML and 50 ML, and account for around 33% of total non-residential usage.
- **Small Users** – the remaining users (around 1,700) make up the small users list, all with annual usage typically less than 1.4 ML, and account for around 22% of total non-residential usage.

## 3.5 Water Losses / Non-Revenue Water (NRW)

The International Water Association (IWA) defines key components of losses from a water supply system<sup>4</sup>:

1. **Real losses**: including leakage and overflows from all parts of the water supply system
2. **Apparent losses**: including metering inaccuracies and unauthorised consumption (theft)
3. **Unbilled authorised consumption**: including water used by the local water utility for operational reasons, water used for firefighting and water supplied free of charge

Water losses are generally defined as real (or physical) losses plus apparent losses, while non-revenue water (NRW) is generally defined as water losses plus unbilled authorised consumption and can be calculated from the difference between water production (metered flow into a water supply system) and metered consumption (metered flow from the water supply system to the end user).

Recent estimates of NRW for each town water supply system are included in Table 3-2. While NRW in Tamworth is relatively low (less than 10%), NRW in the smaller towns is significantly higher, around 20%.

**Table 3-2 Estimates of NRW by Town Water Supply System<sup>1</sup>**

Town Water Supply	NRW Estimate (ML/a)	NRW Estimate (% of production)
Tamworth (and Moonbi/Kootingal)	705	8%
Manilla	81	23%
Barraba	52	22%
Nundle	7	17%
Attunga	11	21%
Bendemeer	8	24%

<sup>3</sup> Hunter H2O (2020), *Tamworth Emergency Water Supply Plan*.

<sup>4</sup> IWA (2019), *Standard Definitions for Water Losses*.

## 4 FUTURE WATER USE

Demand projections for TRC were recently prepared under the Namoi Regional Town Water Strategy (RTWS) project. The Namoi RTWS Demand Assessment Report for TRC<sup>1</sup> considers the assessment of existing and future demands for each town serviced by a town water supply system within the Tamworth LGA.

### 4.1 Future Growth

Historical population growth for Tamworth (city) has averaged around 0.9% pa over the last ten years, while the population across the rest of the LGA averaged around 0.2% pa over the same period. Future population growth rates for Tamworth (including Moonbi / Kootingal) are estimated to be around 1% pa, while growth rates for the other TWS systems are estimated to be either 0.4% pa (Manilla) or 0.2% pa (remaining towns).

Non-residential growth is more difficult to estimate and in the absence of a more detailed assessment of future non-residential development opportunities, non-residential demands are assumed to grow in line with population growth.

### 4.2 Existing and Future Demand Estimates

Table 4-1 contains a summary of existing and future (30 years) demand estimates. Further details are included in **Appendix B**.

**Table 4-1 Tamworth LGA Demand Projections<sup>1</sup>**

TWS System	Tamworth	Manilla	Barraba	Nundle	Attunga	Bendemeer
<b>2021/22</b>						
Average Demand (ML/a)	9,200	355	240	42	53	33
Dry Year Demand (ML/a)	10,500	390	295	57	74	38
Average Day (ML/d)	25.2	1.0	0.66	0.12	0.15	0.09
Peak Day (ML/d)	50.4	2.7	1.65	0.30	0.40	0.23
<b>2051/52</b>						
Average Demand (ML/a)	12,400	400	255	45	56	35
Dry Year Demand (ML/a)	14,200	440	315	61	78	40
Average Day (ML/d)	34.0	1.1	0.70	0.12	0.15	0.10
Peak Day (ML/d)	68.0	3.0	1.75	0.32	0.41	0.25

## 5 WATER EFFICIENCY ACHIEVEMENTS

Over the last five years, TRC has made significant progress in several key areas of water conservation and water efficiency, including:

- Community awareness and education initiatives
- Residential water efficiency rebates (and more recently non-residential rebates)
- Non-residential large user Water Efficiency Assessments.

### Community Awareness and Education Initiatives

TRC's community awareness and education program has expanded significantly over the last 5 years, with the *Let's Thrive* television commercial and waterwise garden booklet, the 2020 *Water Sustainability Awards* and the *Sonny the Sustainability Scout* school education program.

*Let's Thrive* is a TRC initiative designed to encourage waterwise gardens and outdoor areas (see Figure 5-1). The initiative offers residents practical tips to create waterwise gardens, including topics such as: training lawns; alternative water sources; space and planning; alternative ground covers; irrigation systems and water control; and shade. The program was initially launched in the early stages of the most recent drought (in 2017) but was quickly replaced by messaging related to water restrictions. The program was recently relaunched (in 2021) and includes the creation of a waterwise demonstration garden as an education and engagement tool for students.

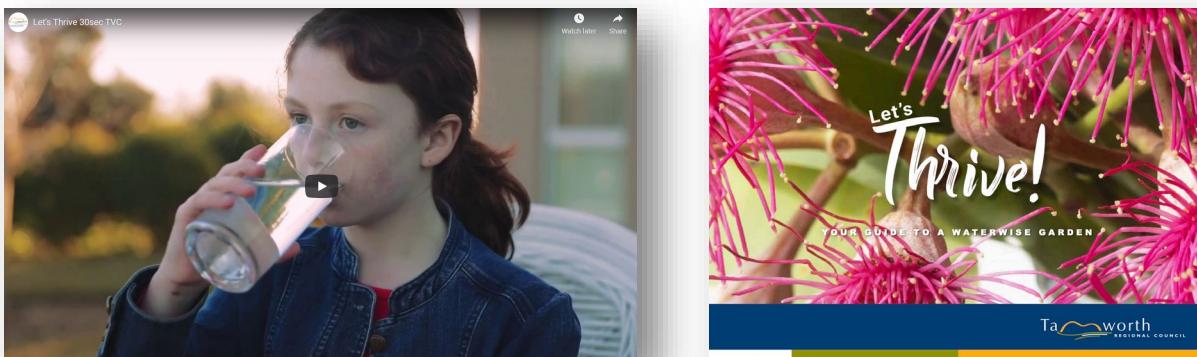


Figure 5-1 *Let's Thrive* TV Commercial and Waterwise Garden Booklet<sup>5</sup>

The *Water Sustainability Awards* were held in 2020 (during the height of the most recent drought) and highlighted business that had recently reduced water consumption, implemented innovative water sustainability initiatives and/or shown a long-term commitment to water conservation. Awards were given in six categories, including: excellence in water efficiency; commitment to water sustainability; adapting to change; innovation in water sustainability; creative water sustainability (High School); and creative water sustainability (Primary School).

<sup>5</sup> <https://www.tamworth.nsw.gov.au/live/environment-and-sustainability/lets-thrive>

*Sonny the Sustainability Scout* is a school education mascot and program that was launched in 2020 and focuses on energy, waste and water sustainability (see Figure 5-2). The water sustainability content is designed to align with the NSW Education syllabus and includes water audits, which provide students with the opportunity to work mathematically in collecting, analysing and representing data. The content also focuses on investigations into water as a resource, aligning with science and technology education topics.



Figure 5-2 School Education Program – *Sonny the Sustainability Scout*<sup>6</sup>

These important water sustainability education tools are being used in schools and in the wider community to improve awareness and understanding of the need for water efficiency and the benefits of adopting more water efficient practices.

### Water Rebates (2016/17 to 2021/22)

Between 2016/17 and 2021/22, Council paid out over \$380,000 in financial assistance (over 3,000 rebates) for TRC residents to install more water efficient products – including dual flush toilets, efficient shower heads, swimming pool covers and rainwater tank – and to improve the water efficiency of existing fixtures – including evaporative coolers and taps. The total estimated savings from water efficient products installed or improved under these rebates is around 70,000 kL/a, which is equivalent to the water consumption of 260 households.

### Non-Residential Water Efficiency Assessments

In mid-2019, TRC engaged specialist consultants to undertake water efficiency assessments for 50 businesses with average annual consumption greater than 3,500 kL. The purpose of the assessments was to note existing areas of water efficiency and any potential opportunities for further improvements.

Potential water efficiency improvements were identified at 47 of the 50 sites, with total estimated potential water savings (if all measures were implemented) of more than 600,000 kL/a. However, many of the potential water savings measures need further investigation and the potential savings need to be refined and, in some cases, may not be economic.

The audits also identified leaks at 4 of the 50 sites, which have since been fixed, and numerous opportunities for low-cost water savings, including: showerhead replacements; basin tap replacements or installation of aerators; and pool covers on hotel and caravan park pools.

<sup>6</sup> <https://sustainablesonny.tamworth.nsw.gov.au>

## 6 DEMAND MANAGEMENT PROGRAM

The following revised Demand Management Program has been adopted by Council.

Demand Management Measure	Details	Customers Targeted	Estimated Council Program Cost* (\$ pa)
Community Awareness Program	<ul style="list-style-type: none"> <li>• Continuation and ongoing development of Community Awareness Program, including:           <ol style="list-style-type: none"> <li>1. Seasonal media advertising campaign</li> <li>2. Water efficiency resources, including <i>Let's Thrive</i> waterwise garden booklet</li> <li>3. Education stands at shopping centres and shows / events, and community / school education guest speaking</li> <li>4. <i>Sonny the Sustainability Scout</i> school education program, including resource kits</li> <li>5. Customer water accounts to include comparisons to benchmark usage &amp; water efficiency tips</li> <li>6. Evaporative cooler water efficiency education</li> <li>7. Commercial / business water efficiency tips</li> </ol> </li> <li>• Maintain strong water conservation signals through the continued use of tiered water usage pricing</li> </ul>	All	\$50K
Water Rebates	<ul style="list-style-type: none"> <li>• Up to 50% rebate offered on water savings products installed in a home or business, including:           <ul style="list-style-type: none"> <li>○ 3-star showerheads &amp; dual flush toilets</li> <li>○ Swimming pool covers &amp; backwash recycling system</li> <li>○ Rainwater tanks connected to garden and toilet and/or laundry</li> <li>○ Greywater treatment and diversion systems</li> <li>○ Hot water system diverters</li> <li>○ Plumber audits and evaporative cooler servicing</li> <li>○ Various commercial cleaning units (business only)</li> </ul> </li> </ul>	Existing houses & businesses	\$100K
Large User Water Efficiency Assessments	<ul style="list-style-type: none"> <li>• Non-residential large user Water Efficiency Assessments</li> <li>• Council Water Efficiency Assessments (including high water use buildings and other facilities / assets)</li> <li>• Ongoing consultation with large users to review progress towards implementing water efficiency measures</li> </ul>	Non-residential large water users	\$30K

Demand Management Measure	Details	Customers Targeted	Estimated Council Program Cost* (\$ pa)
<b>Everyday Waterwise Guidelines</b> <i>(previously Permanent Water Conservation Measures)</i>	<p>Everyday waterwise guidelines will continue to be publicised as an integral part of the Community Awareness Program to encourage common sense practices that help save water:</p> <ul style="list-style-type: none"> <li>• <b>Only water the garden before 10 am or after 4 pm.</b> This avoids watering during the hottest part of the day when evaporation is high.</li> <li>• <b>Trigger nozzles to be used on all handheld hoses.</b> Trigger nozzles provide more control over water flow and reduce wastage.</li> <li>• <b>Avoid hosing down hard surfaces, such as concrete, paths and driveways.</b> Use a broom or leaf blower, or if water is required, use a high-pressure cleaner or water efficient nozzle.</li> </ul>	All	<i>(Costs included in Community Awareness Program)</i>
<b>Regulation &amp; Planning Controls</b>	The following regulation and planning controls will contribute to water savings over the life of the Program: <ul style="list-style-type: none"> <li>• BASIX</li> <li>• WELS Rating Scheme</li> <li>• Smart Approved WaterMark Program</li> <li>• Tamworth Regional Development Control Plan</li> </ul>	New Residential + New Fittings / Appliances	<i>(Costs included in Community Awareness Program)</i>
<b>Water Loss Management</b>	Water Loss Management Program, which includes: <ul style="list-style-type: none"> <li>• Metering of all properties / connections</li> <li>• Installation of automated meter reading (AMR) or ‘smart meters’ across all properties by 2024</li> <li>• Annual water loss assessment</li> <li>• Periodic inspection of key assets for leaks</li> <li>• Participation in Water Leak Reduction Pilot Program</li> </ul>	All water supply systems	<i>(Costs already included in Water Operations Budget)</i>
<b>Water Recycling &amp; Potable Substitution</b>	<ul style="list-style-type: none"> <li>• Water recycling and other potable substitution initiatives have previously been implemented or will be implemented over the life of the Program and will further contribute to drinking water savings, including: <ul style="list-style-type: none"> <li>○ Use of recycled backwash plus rainwater at AELEC and nearby sports grounds</li> <li>○ Use of groundwater bores at various parks, reserves and playing fields to replace the use of drinking water for irrigation</li> <li>○ Use of recycled effluent onsite at Westdale WWTP</li> </ul> </li> <li>• Investigation of new opportunities for commercial / industrial water recycling, including advancing the proposed Tamworth Water Purification Facility for industrial reuse.</li> </ul>		

Note: \* Estimated Council Program Cost includes the additional funding that Council will need to budget for over and above its normal water operating expenses. Costs associated with the funding of a full-time Water Sustainability Officer and water loss management costs are considered normal operating expenses and have not been included in the above table.

## 6.1 Community Awareness Program

A Community Awareness Program<sup>7</sup> has been in place since 2007 and will continue to be an integral component of the Demand Management Program. The awareness program is multi-faceted and includes media advertising / promotion, marketing / publicity, publications, internet resources and community and school education. The Community Awareness Program will continue to be reviewed and updated to make sure it is relevant and consistent with the other demand management measures.

The Community Awareness Program includes:

- A seasonal media advertising campaign that focuses on water efficiency around the home, including both indoor and outdoor usage. Specific attention will be given to awareness and education on water consumption associated with gardens and evaporative cooling systems, and raising awareness of waterwise products that are available through the water rebate scheme (see Section 6.2).
- Avenues for the community to access resources on water efficiency, including brochures / publications and internet sites. This includes the *Let's Thrive*<sup>5</sup> waterwise garden booklet and Council's sustainable garden, which showcases a variety of ground cover alternatives to water-thirsty lawn and turf.
- Setting up of education stands periodically in shopping centres and at major local shows and events, including during National Water Week and the associated Water Night. This supported by community / school education guest speaking.
- *Sonny the Sustainability Scout*<sup>6</sup> school education program, including a water efficiency resource kit to encourage schools to integrate water conservation into their curriculum and reduce water consumption throughout the school.
- Customer water accounts that include water efficiency tips and provide information on customer's water usage relative to water efficient benchmarks, based on household / business size. This will be further enhanced by the rollout of smart water meters across 2023 and 2024. Smart meters will allow residential and non-residential water customers to access daily water consumption data and therefore to better understand their water consumption habits.
- An increasing focus on non-residential water efficiency, including educating businesses on ways to reduce water wastage and encouraging new developments to incorporate more water efficient facilities and landscaping.

In order to administer the Community Awareness Program and many of the other demand management measures, TRC employs a Water Sustainability Officer. This employee is primarily responsible for water education in the community and general administration of the Demand Management Program. Council may also utilise external resources from time to time, including the local TAFE College and other vocational training organisations, to assist in the development and implementation of marketing and educational programs.

The Community Awareness Program has undoubtedly contributed significantly to the water efficiency savings that have been achieved to-date, particularly the 20% reduction in household usage. Continuation and ongoing development of the program is needed to maintain the savings associated with this reduction in residential usage. A relaxation of the Community Awareness Program is likely to result in a gradual increase in residential usage over time, as inefficient water habits are once again adopted.

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<sup>7</sup> <https://www.tamworth.nsw.gov.au/live/environment-and-sustainability/water-sustainability>

## Pricing

Water pricing is an important component of community awareness and education. Council's water supply charges for residential customers for 2022/23 are summarised on Table 6-1, with water supply charges for all water users documented in TRC's Our Community Plan, within the Revenue Policy<sup>8</sup>.

**Table 6-1 TRC Water Supply Charges – Residential (2022/23)**

Category	2022/23 Charge
Fixed residential charge	\$295 pa
Residential consumption charge (0 to 400 kL)	\$1.67 / kL
Residential consumption charge (401 to 800 kL)	\$2.51 / kL
Residential consumption charge (above 800 kL)	\$3.77 / kL

Across both residential and non-residential water supply charges, consumption charges account for approximately 60% of total charges, while fixed charges account for the remaining 40%.

While the current water supply charges contain a reasonably strong signal conserve water, including through the use of tiered consumption charges, the tier bands need to be reviewed and updated to reflect more recent water consumption practices. Consequently, there is a need to undertake a review (economic study) of water supply charges.

It is proposed to undertake a major review of water supply charges within the life of this Plan. The review would consider:

- Tariff structure, including potential changes to tier bands and a potential reduction from three bands to two bands.
- The impact of smart water meters, including the potential for more frequent meter reading.
- Changing bulk water access and consumption charges.
- Recycled effluent pricing.
- Socio-economic impacts of increasing tariffs, including ensuring water continues to be affordable for all, while encouraging sustainable water use and discouraging water wastage.

<sup>8</sup> <https://www.tamworth.nsw.gov.au/about/policies-plans-and-regulations/community-strategic-plan>

## 6.2 Water Rebates

A water rebate scheme for the purchase of a variety of water efficient products has been in place since 2007 and will continue as a financial incentive for residential and non-residential customers to be more water efficient. The rebate scheme complements the federal government's Water Efficiency Labelling Scheme (WELS) and the NSW government's BASIX planning controls (see Section 6.4), by targeting older properties with inefficient fixtures. Rebates of 50% of purchase cost of the product, up to a certain limit, are generally offered. As the rebates are funded from Council's water budget, only customers connected to the reticulated water supply systems are eligible.

Rebates are generally limited to one rebate of each type per property and are available to both existing and, in some cases, new dwellings – as long as the water efficient product are not required to be installed as part of the conditions of development, including BASIX requirements.

Water rebates that are targeted at households are also available to businesses, subject to eligibility requirements. In 2019, TRC introduced additional water rebates specifically for businesses and these rebates target various commercial cleaning units and waterless urinals.

A summary of the water rebates currently offered is included in Table 6-2, with full details included on Council's website, including an online form for rebate applications<sup>9</sup>.

**Table 6-2 Current TRC Water Rebates**

Residential, Business & Commercial Water Rebates		Business & Commercial (Only) Water Rebates
Plumbers Audits	Ceiling fans	Commercial paint brush cleaners
3-star showerheads (or Oxijet)	Evaporative air conditioner servicing & maintenance	Commercial steam cleaners
Shower controller devices	Rainwater Tanks – connected and standalone (small, medium, large)	Commercial chemical cleaners
Toilets dual flush	Swimming Pool Covers	Commercial pre-rinse spray/mixer/nozzle ware
Toilets with cistern sink	Swimming pool backwash recycling systems	Commercial dishwashers / glasswashers
Taps (waterblade, low flow, sensor)	Greywater diversion and/or treatment systems	Commercial washing machines
Hot water system diverters	Tree well water savers	Waterless urinals

<sup>9</sup> <https://www.tamworth.nsw.gov.au/live/water-and-wastewater/water-rebates>

## 6.3 Large User Water Efficiency Assessments

The non-residential Water Efficiency Assessment program has been very successful in reducing the consumption of large users over the past five years and will continue, with a focus on:

- Existing or new large users not previously subject to a Water Efficiency Assessment
- Revisiting large users that have previously implemented water savings actions and confirming achieved water savings
- Ongoing consultation with larger users to review progress towards implementing water efficiency measures

The purpose of a Water Efficiency Assessment is to identify and help deliver cost effective water savings in a practical, effective and flexible way. The initial audit and subsequent preparation of the Water Efficiency Assessment would be undertaken by the non-residential customer in association with the nominated TRC employee responsible for water education or an external consultant.

As one of the region's largest users, Council will continue to review and update its previous Water Efficiency Assessment based on its own operations. This will include specific focus on high water use buildings and other facilities and assets (e.g. parks and gardens, and other open space watering).

## 6.4 Everyday Waterwise Guidelines

Previously referred to as Permanent Water Conservation Measures (PWCM), everyday waterwise guidelines have been adopted as a key component of Council's Demand Management Plan. The waterwise guidelines help to ensure that common sense water use practices are adopted by the community and to reinforce other demand management measures by developing a culture of water efficiency. The waterwise guidelines are similar to the previously adopted PWCM but are easier to understand and follow.

The everyday waterwise guidelines are:

1. **Only water the garden before 10 am or after 4 pm.** This avoids watering during the hottest part of the day, when water wastage and evaporation is high.
2. **Trigger nozzles to be used on all handheld hoses.** Trigger nozzles provide more control over water flow and reduce wastage.
3. **Avoid hosing down hard surfaces, such as concrete, paths and driveways.** Use a broom or leaf blower, or if water is required, use a high-pressure cleaner or water efficient nozzle.

## 6.5 Regulation & Planning Controls

TRC continues to actively support and implement various local, state and national based regulation and planning controls that promote water efficient products, practices and developments. Key regulation and planning controls that will be supported and promoted by the Community Awareness Program include:

- **BASIX<sup>10</sup>:** The NSW Government has implemented residential building planning controls that require all new homes (and homes undergoing major renovations) to be water and energy efficient. New homes are generally required to install water efficient fittings, have indigenous garden species and install a rainwater tank.
- **WELS Rating Scheme<sup>11</sup>:** The State and Federal Government have implemented the Water Efficient Labelling & Standards (WELS) rating scheme which applies national mandatory water efficiency labelling (up to 6 Stars) and minimum performance standards to household water-using products (see Figure 6-1).
- **Smart Approved WaterMark Program<sup>12</sup>:** This program was established by four associations (Australia Water Association, Irrigation Australia, Nursery and Garden Industry and Water Services Association of Australia) as a nationally endorsed, non-compulsory water efficiency labelling scheme for products and services which primarily help reduce outdoor water use (see Figure 6-1).
- **Tamworth Regional Development Control Plan<sup>13</sup>:** The Plan contains the key criteria for specific types of development that commonly occur in the Tamworth Regional LGA and for specific locations within the region. The Plan requires new residential developments to include at least two Water Sensitive Essentials (WSE) measures, such as: water efficiency appliances and fixtures; rainwater tanks; landscaped stormwater retentions area; and/or greywater diversion devices / greywater treatment devices.



Figure 6-1 Smart Approved WaterMark and WELS Rating Scheme Labels

<sup>10</sup> <https://www.planningportal.nsw.gov.au/basix>

<sup>11</sup> <https://www.waterrating.gov.au>

<sup>12</sup> <https://www.smartwatermark.org>

<sup>13</sup> <https://www.tamworth.nsw.gov.au/develop/planning-controls/development-control-plans>

## 6.6 Water Loss Management

Real losses (sometimes called physical losses) are generally the largest component of water losses. They are primarily an operation and maintenance issue and are therefore generally the losses that are targeted in a demand management program. Water losses are best managed by way of a Water Loss Management Program (which often is a component of a more comprehensive Asset Management Program).

The Water Loss Management Program will continue to focus on the following areas:

- Metering of all properties and connections, including all public facilities, parks and gardens, standpipes and Council's water and sewer facilities (eg pumping stations).
- Preparation of an annual Water Loss Management Progress Report, which includes an assessment and breakdown of annual water loss for each water supply system based on the preceding 12 months of metering data.
- Where the annual water loss audit has shown an increase in physical / real losses, inspections of key assets for the detection and repair of system leaks will occur, including inspection of water reservoirs, water pumping stations, major water system control valves and Council swimming pools.

Water loss management will be further enhanced through TRC's participation in DPE's Regional Water Leak Reduction Pilot Program, which is providing co-funding (25%) over a two year period (2022/23 and 2023/24) towards: acoustic leak detection; leak reduction and awareness training; pressure data logging; advanced pressure management; leak noise loggers; and district metering areas (DMA) installation and analysis.

Smart water meters are to be installed on all properties connected to a town water supply system in the Tamworth LGA in 2023 and 2024. The smart meters will allow for automated metered reading (AMR) and will also allow customer access to daily water consumption via a customer portal. A key advantage of smart metering is that household water losses (typically leaks in pipework, taps or fixtures) can more easily be identified.

## 6.7 Water Recycling & Potable Substitution

The following water recycling and potable substitution initiatives have previously been implemented or will be implemented over the life of the Program and will further contribute to potable water savings:

- Use of recycled backwash from Calala WTP and rainwater from roof runoff for irrigation at the Australian Equine and Livestock Events Centre (AELEC) and nearby sporting venues
- Use of groundwater bores at various parks, reserves and playing fields
- Use of recycled effluent at Westdale Wastewater Treatment Plant for on-site wash down and grounds maintenance
- Lot scale water recycling opportunities such as rainwater tanks and greywater reuse are covered by BASIX for new developments and/or the residential rebate scheme.

In addition to the above ongoing initiatives, Council is investigating commercial and industrial water recycling projects. This includes the proposed Tamworth Water Purification Facility, which will use an advanced water treatment process to recycle industrial effluent and produce purified recycled water for industrial use.

## 6.8 Future Initiatives

The importance of demand management and water efficiency and the impact on long term water security will be considered further in the Tamworth Water Security Plan, which is being prepared over a two and half year period, starting in early 2023. The Water Security Plan will consider the best combination of demand-side and supply-side initiatives that are required to ensure long term water security.

The future development of TRC's Demand Management Program and the various water conservation and water efficiency measures that make up the program needs to be considered within the context of future options to improve water security. Similarly, the economics of demand-side measures, particularly the annual cost of implementing measures versus the annual water savings that result from the measures, needs to be considered in more details and within the context of the economics of supply-side measures.

The following water conservation and water efficiency measures will be considered in the future, either as part of the Tamworth Water Security Plan and/or in the next major update of the Demand Management Plan:

- Increased use of purified recycled water (effluent reuse) to substitute for potable water, including the use of purified recycled water for industrial water users.
- Stormwater recycling.
- Expansion of water efficiency measures associated with evaporative coolers.
- Further incentives for households to invest in water efficiency measures (e.g. different types of water rebates)
- Further incentives for businesses and large users to invest in water efficiency measures.
- Demonstration projects to assist with community education (e.g. sustainable house and garden).
- Using smart meter data and digital analytics to better design programs that maximise water savings and minimise cost.
- Other innovations and emergency technologies

The NSW Government is in the process of developing a state-wide Water Efficiency Framework and Program<sup>14</sup> to support communities with building future resilience to climate change and droughts. The state-wide focus, research and resources associated with the new NSW Water Efficiency Framework and Program will benefit future versions of TRC's Demand Management Program.

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<sup>14</sup> <https://www.dpie.nsw.gov.au/water/plans-and-programs/water-efficiency>

## 7 IMPLEMENTATION & MONITORING

This Demand Management Plan outlines the various demand management measures that have been adopted by TRC and will be employed to encourage water efficiency across the water supply systems that are operated by Council. The development of implementation plans and ongoing monitoring of the individual programs are critical to the success of the Demand Management Plan.

Any new demand management measures will require an implementation plan to be developed and documented by Council to ensure the successful setup and delivery of the specific program. The implementation plan would cover the following key areas:

1. Program objectives and duration
2. Identify key people responsible for implementing the program
3. Identify any specific training needs
4. Develop more detailed budgets, including identifying other resourcing requirements (need to develop annual budgets for the life of the program)
5. Develop a communication strategy (in association with Community Awareness Program)
6. Scheduling and specific requirements for monitoring and evaluation

Where pilot programs have been proposed, the implementation plan would also cover the implementation of the pilot program, including the scope and expected length of the pilot program and how the full program will be rolled out once the pilot program has been completed. Depending on the outcomes of the pilot program, the implementation plan may need to be revised before rolling out the full program.

For demand management measures that have been previously implemented by Council, these measures are unlikely to need a specific implementation plan unless the nature of the program has changed significantly or other issues such as additional training or monitoring have been identified.

Regular monitoring, evaluation and review will be required for each individual program, as well as the overall Demand Management Program. Monitoring and evaluation of individual programs should include consideration of key outcomes (eg water savings, participation rates, customer satisfaction) and key processes (eg ease of implementation, Council costs / resources to run program). Monitoring and evaluation of the full Demand Management Program should also be undertaken to assess effectiveness of the combined programs and how they relate to each other.

Four yearly Environmental Sustainability Strategies will continue to be prepared by Council's Sustainability Team and will include more detailed goals and actions associated with implementing and monitoring the Demand Management Program.

The Demand Management Plan should be reviewed and updated at least every 5 – 6 years.

## **APPENDIX A**

## **LOCATION AND CLIMATE**

## Appendix A – Location and Climate

### Location and Climate

TRC serves a population of just over 60,000 and covers an area of 9,893 km<sup>2</sup> stretching from the Nandewar Range north of Barraba, south-east to the Peel and Great Dividing Ranges. In addition to the towns and villages that have reticulated water supply systems there are several other villages located within the local government area that do not have formal water supply systems, including Dungowan, Woolomin, Duri, Somerton and Woolbrook. The nearest cities/towns outside of TRC are Armidale (which is located around 115km to the northeast of Tamworth) and Gunnedah (which is located around 80 km to the west).

The Tamworth Region experiences a dry sub-humid climate. Temperatures are warm to hot in summer with relatively low humidity, mild in autumn and spring and cool to mild in winter. Rainfall is generally lower over the autumn and winter months and highest in summer months due to a predominance of summer storms.

Median rainfall in Tamworth city is 628 mm per annum, however higher rainfall is experienced in more elevated areas (>800mm pa in Nundle and Bendemeer). Average annual evaporation is 1971 mm per annum, and average 3 pm relative humidity is 41%. Monthly climate statistics for Tamworth are included on the table below.

**Table A1 Climate Statistics – Tamworth Airport (1992 – 2022)**

Climate Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Rainfall (mm)	61.2	73.9	57.2	25.3	30.4	53.4	40.9	39.5	42.9	55.2	82.3	80.4	638.5
10%ile Rainfall (mm)	14.1	17.0	8.7	0.4	1.5	12.5	8.8	3.4	9.6	13.3	32.2	34.9	390.8
Mean Evap. (mm)*	267	227	214	138	90	60	65	93	132	186	228	270	1971
Mean Max. Temp (°C)	33.0	31.5	29.2	25.5	20.8	17.0	16.5	18.5	22.1	25.7	28.6	30.8	24.9

Notes \* The mean evaporation is based on data from 1973-1992 at weather station 55054

It is widely accepted that future climate changes could impact water supply systems through changing frequency and duration of rainfall, as well as an increase in evaporation. While estimating the impacts associated with future climate change is very difficult and is an evolving science, recent studies have started to provide some indication of the potential climate impacts. However, modelling to-date has focused more on changes in average monthly or annual statistics and less on the duration and frequency of extreme events, which is more critical for drought management.

A summary of the estimated impacts of future climate change on maximum temperatures and rainfall for the New England / North West region is shown in Table A2.

In general:

- Mean temperatures are projected to rise by around 0.7 °C by 2030 (and by 2.2 °C by 2070).
- Annual rainfall will not change much in the near future (less than 2% increase by 2030) and may actually increase in the far future (+8% by 2070). However, the distribution of rainfall is expected to change.

## Appendix A – Location and Climate

**Table A2 Max Temperature and Rainfall Predictions for New England / North-West Region (Near Future)<sup>15</sup>**

Season	Maximum Temperatures	Rainfall
Spring	0.5 to 1.2°C warmer	-11 to 19% increase
Summer	0.5 to 1.4°C warmer	-15 to 14% increase
Autumn	0.5 to 0.9°C warmer	-9 to 47% increase
Winter	0.3 to 0.6°C warmer	-26 to 15% increase

Estimated changes in surface runoff and recharge to groundwater are provided in a report by the NSW Government Office of Environment and Heritage<sup>16</sup>. On average, across the Namoi region, runoff is estimated to increase by around 4% in the near future (2030) and by around 25% in the far future (2070).

In the near future estimate, summer runoff is likely to decrease across much of NSW, especially in north-eastern areas. In contrast, autumn runoff is projected to increase across large areas of NSW. Winter runoff is projected to decrease around the New England / North-West region. Spring runoff is projected to increase, though not as much as the autumn estimates. The recharge to groundwater in the Namoi catchment is estimated to decrease by around 7% in the near future and increase by around 12% in the far future.

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<sup>15</sup> <https://www.climatechange.environment.nsw.gov.au/projections-map>

<sup>16</sup> OEH (2015), *Climate Change Impacts on Surface Runoff and Recharge to Groundwater*. Prepared by Mark Littleboy, John Young and Joel Rahman for the NSW Office of Environment and Heritage.

## **APPENDIX B**

## **DEMAND PROJECTIONS**

## Appendix B – Demand Projections

### TRC Demand Projections<sup>17</sup>

TWS System	Tamworth	Manilla	Barraba	Nundle	Bendemeer	Attunga
<b>2021/22</b>						
Average Demand (ML/a)	9,200	355	240	42	33	53
Dry Year Demand (ML/a)	10,500	390	295	57	38	74
Average Day (ML/d)	25.2	1.0	0.66	0.12	0.09	0.15
Peak Day (ML/d)	50.4	2.7	1.65	0.30	0.23	0.40
<b>2031/32</b>						
Average Demand (ML/a)	10,200	370	245	43	33	54
Dry Year Demand (ML/a)	11,600	405	300	58	38	76
Average Day (ML/d)	28.0	1.0	0.67	0.12	0.09	0.15
Peak Day (ML/d)	56.0	2.7	1.68	0.31	0.23	0.40
<b>2041/42</b>						
Average Demand (ML/a)	11,200	385	250	44	34	55
Dry Year Demand (ML/a)	12,800	425	310	59	39	77
Average Day (ML/d)	30.7	1.1	0.68	0.12	0.09	0.15
Peak Day (ML/d)	61.4	3.0	1.70	0.31	0.24	0.41
<b>2051/52</b>						
Average Demand (ML/a)	12,400	400	255	45	35	56
Dry Year Demand (ML/a)	14,200	440	315	61	40	78
Average Day (ML/d)	34.0	1.1	0.70	0.12	0.10	0.15
Peak Day (ML/d)	68.0	3.0	1.75	0.32	0.25	0.41

<sup>17</sup> Hunter H2O (2022), Namoi Regional Town Water Strategy: TRC Demand Assessment. Prepared for Tamworth Regional Council.



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