1. Introduction

1.1. Context and overview

This National performance report 2023–24: urban water utilities (2024 Urban NPR) supports the commitments made by states and territories under the National Water Initiative (NWI) to report publicly and independently on the performance of water utilities[2].

The 2024 Urban NPR compares the performance of 81 utilities and councils (utilities) and 5 bulk water authorities that provide urban water and sewerage services to over 26 million people across Australia. It is produced by the Bureau of Meteorology (the Bureau) in conjunction with state and territory governments and the Water Services Association of Australia.

Part A of this report provides commentary on, and analysis of, key indicators that apply to retail and distribution utilities. The Major urban centre analysis in Chapter 2 includes performance data for bulk water suppliers. Part B of this report contains data for the full set of indicators that are reported on by urban water utilities and bulk water authorities for all reporting years.

The 2020 NPR indicator review[3] recommended the retirement of 11 indicators out of the 166 indicators historically defined in the Urban NPR Framework. The retired indicators are C13, C14, C19, F11.1, F12.1, F13, F13.1, F28.1, F29.1, H4a, and W14. The review found no specific use case for these indicators within the NPR Framework, indicating that their removal would not result in any material loss of information, as individuals can still retrieve and assess this information if required. As a result, the 2024 Urban NPR includes a total of 155 indicators.

The analysis and commentary provide context for each indicator, discuss changes in reporting methods, and highlight trends within and/or between different utility groups. The utilities are grouped according to the number of properties they are connected to, as explained in ‘A guide to this report’.

The commentary and analysis in the 2024 Urban NPR are not intended to be a comprehensive explanation of every reported indicator. They present some of the significant trends or differences between years and between utilities. Most of the information is sourced from publicly available sources such as annual reports, regulatory decisions and utility websites. This information is also validated by the Technical Reference Group, which includes state and territory representatives.

1.2. Reporting

The 86 utilities (including 5 bulk water authorities) contributing data to the 2024 Urban NPR are listed in Appendix C. Table 1.1 summarises the utility size groups by jurisdiction.

Seventy-two of the 86 utilities included in this report provide both reticulated water supply and wastewater (sewerage) services. The remaining utilities provide either water supply or sewerage services. In summary, the report includes data for:

- 72 utilities providing water supply and sewerage services
- 5 utilities providing only water supply services
- 4 utilities providing only sewerage services

[2] National Water Initiative clauses 75–76

[3] http://www.bom.gov.au/water/npr/framework-review/

- 5 bulk water authorities.

There were no changes in the number of utilities reporting to the NPR framework in 2023–24 compared to 2022–23. However, the financial data for 2 utilities in regional New South Wales (Dubbo Regional Council and Orange City Council) were unavailable at the time of report preparation. Consequently, this data is not included in the analysis.

Table 1.1 Utilities reporting in the 2024 Urban NPR by size group and jurisdiction

Jurisdiction	Bulk	Major	Large	Medium	Small	Total
Australian Capital Territory		1				**1**
New South Wales	2	3	1	13	12	**31**
Northern Territory			1		1	**2**
Queensland	2	4	5	4	7	**22**
South Australia		1			1	**2**
Tasmania		1				**1**
Victoria	1	4	5	5	1	**16**
Western Australia		1	1		9	**11**
Total	**5**	**15**	**13**	**22**	**31**	**86**

1.3. Locations of utilities

Figure 1.1 shows the administrative boundaries of all utilities reporting data for the 2024 Urban NPR. Further details about the utilities are available from the relevant utility websites. While the SA Water Corporation provides services across South Australia, it does not provide water and wastewater services to all communities, which are also serviced by councils and private entities.[4]

[4] Maps of cities and towns serviced by SA Water are available in SA Water's 2023–24 annual report p.12. 2023-24 South Australian Water Corporation Annual Report

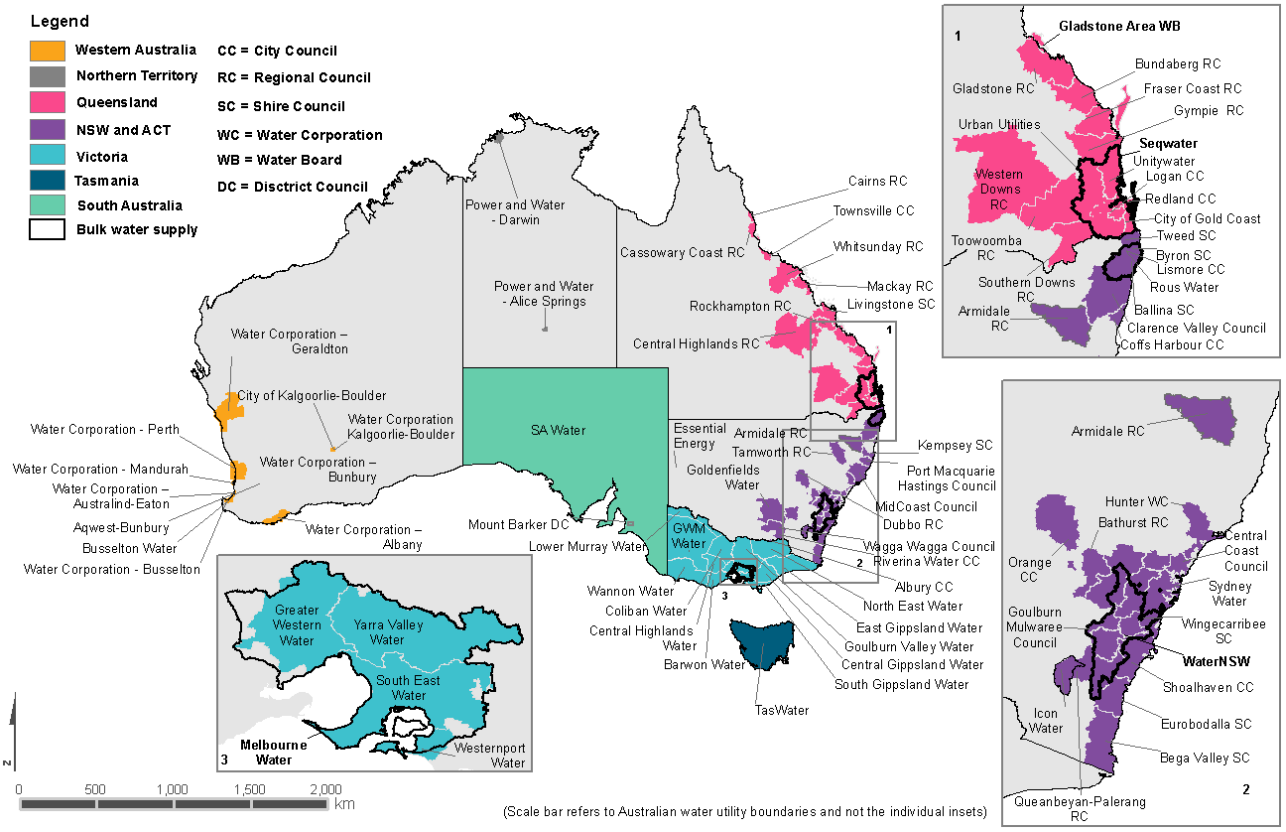

Figure 1.1 The administrative boundaries of all utilities reporting data for 2023–24

1.4. Key drivers

Key drivers of water utility performance presented in the 2024 Urban NPR include rainfall, temperature, utility size and sources of water.

Other factors also affect performance but are not discussed in detail. These include:

- network density
- soil types
- the age and condition of infrastructure
- impacts of the COVID-19 pandemic
- geographic location and remoteness
- government policy and regulation.

1.4.1. Rainfall

Rainfall can affect utility performance in many ways.

- Significant droughts with prolonged periods of low rainfall can stress urban water supply systems. Depending on the severity of the drought, security of the system and availability of climate-resilient water sources (for example, desalinated or recycled water), the utility may impose water restrictions to conserve water and ensure continuity of the water supply.
- Wet or dry conditions can affect demand for outdoor watering, resulting in a change in the volume of urban water and recycled water supplied to residents, councils, and parklands to be used for outdoor leisure activities such as golf courses (Water resource indicators W12, W26).

Changes in water consumption affect the revenue collected by utilities, their profitability, and the strength of their water-usage pricing signal.

- Wet or dry conditions can affect decisions about the water sources used (Water resource indicators W1 to W7). Persistent dry conditions can trigger thresholds for production from desalination plants and the use of groundwater and recycled water sources, which affect the operating costs of utilities (Finance indicators F11 and F12).To mitigate risks associated with the variable quality of raw water due to prolonged severe wet weather and flood conditions, utilities might decide to increase use of desalinated water (increasing W3.1).
- Increased rainfall can result in infiltration of water into sewer systems, which can increase the volume of sewage to be pumped and treated, increasing the operating costs of utilities (Finance indicator F12) and greenhouse gas emissions from sewage (Environment indicators E10, E12). Additional rainfall and sewer infiltration can also result in additional sewer overflows, especially during heavy rainfall.
- Extreme wet or dry conditions can cause expansion and shrinking of reactive clay soils in some parts of Australia. This can result in ground movement causing an increase in water or sewer main breaks (Asset indicators A8, A14), especially when conditions fluctuate rapidly from wet to dry or dry to wet. In periods of more consistent rainfall, the soils maintain more even moisture levels, resulting in less ground movement.

In 2023–24, Australia's total rainfall was 14% above the 1961–90 average (at 532.2 mm). Rainfall for the financial year (Figure 1.2) was above to very much above average for most of the Northern Territory, northern and western Queensland, inland and coastal areas of New South Wales, some parts of north-eastern South Australia, and an area extending from north-east to south-east Western Australia. It was the sixth-wettest financial year on record in the Northern Territory, with highest on record rainfall for its central regions. However, rainfall was below to very much below average for Tasmania, much of Victoria, coastal and some inland areas of South Australia, and the west coast and southern areas of Western Australia. Some areas of south-west Western Australia, south-eastern South Australia, South-western Victoria, and north-western Tasmania experienced the lowest rainfall on record. Tasmania had the third-driest financial year on record.

Winter and spring rainfalls were below average while summer and autumn rainfalls were above average for Australia as a whole. Autumn rainfall was the highest since 2011. There were monthly and regional variations. November 2023 rainfall was 43% above average with showers and locally severe thunderstorms across parts of the north and east. Australia had its ninth-wettest January on record in 2024, with widespread storms, tropical cyclones and heavy rainfall across the north. There were frequent thunderstorms in areas of Queensland, New South Wales and Victoria.

Tropical cyclones Jasper and Kirrily, which formed in December 2023 and January 2024 respectively, caused widespread heavy rainfall on the east and north of Queensland. March 2024 was the third-wettest March on record, with areas of central Northern Territory and inland Western Australia experiencing their highest rainfall on record. Tropical Cyclone Megan brought heavy rainfall to northern and coastal parts of the Northern Territory and northern Queensland. February to June 2024 rainfall was below average for much of Victoria, south-western Western Australia, the South Australia coastline and Tasmania.

More information is available in the Bureau's 2023–24 Climate and Water Statement.

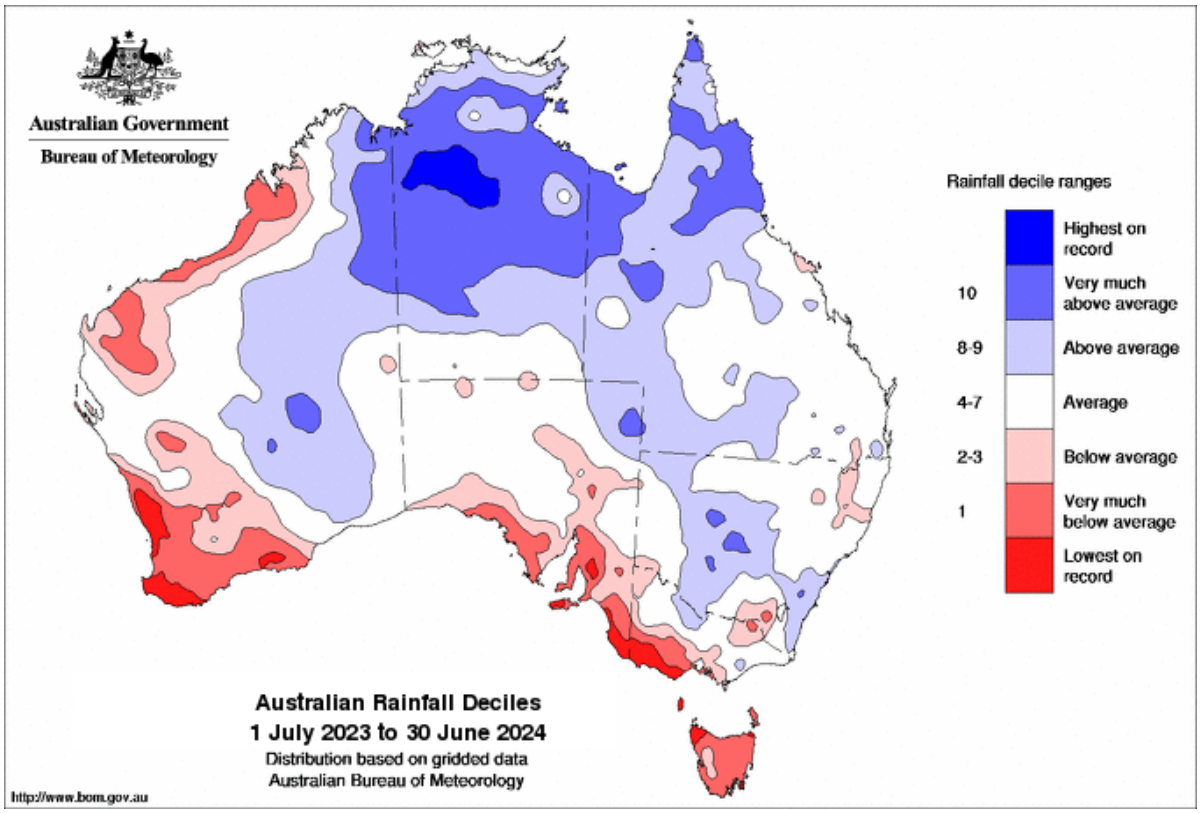

Figure 1.2 Rainfall decile map for 2023–24 (based on all years of data since 1900)

1.4.2. Temperature

Temperature can affect utility performance in many ways.

- Temperature can influence demand for water, particularly for residential and non-residential outdoor use. Prolonged periods of above-average temperatures can result in increased supply of potable and recycled water (Water resource indicators W12, W26, W27) to residents, councils and parklands for outdoor leisure activities such as to golf courses. Changes in water consumption affect the revenue collected by water utilities, their profitability (Finance indicators F3, F24) and the strength of their water-usage pricing signal (Finance indicator F4).
- Hot weather can increase the risk of bushfires, resulting in resources being deployed to protect water supply catchments and control bushfires. Emergency deployments can affect operating expenditure (Finance indicators F11 and F12). When responding to a bushfire, temporary water restrictions may be put in place to ensure the availability of supply and to meet firefighting requirements during extreme fire weather. These restrictions can affect the volume of water supplied by a utility and its operating cost and revenue. Poor water quality in a burnt catchment can affect the availability of water supply and the cost of treatment.
- Extended periods of heat or cold can affect the quality of water sources and supply, and in turn, decisions about water sources used (Water resource indicators W1 to W7) and the level of treatment required. For example, a heatwave can contribute to the decline in dissolved oxygen levels in a waterbody and can trigger the need to supply water from an alternative source, or increase water treatment, which affects the operating costs of utilities (Finance indicators F11 and F12).
- Changes in temperature can affect water quality as biological processes are particularly sensitive to extremes of heat or cold and rapid fluctuations in temperature. This can affect the

quality of water supplied (Health indicators H1 to H5) and treatment requirements, which impact the operational costs of a utility (Finance indicators F11 and F12).

- Extended hot conditions cause dry soil conditions. Trees will seek out moisture and their roots can enter the sewer system, causing blockages and breaks (Asset indicators A14, A15), and increasing the number of water main breaks (Asset indicator A8).

In 2023–24, the national mean temperature was 1.31 °C above the 1961–90 average, the second warmest on record, behind 2015–16 (Figure 1.3). The national average maximum and minimum temperatures were 1.56 °C and 1.05 °C warmer than the long-term average, respectively. Maximum temperatures were the highest on record for the west coast extending to inland of Western Australia, northern and eastern Tasmania, some parts of inland South Australia, and the New South Wales coast. An area of central Northern Territory experienced below average maximum temperatures. Minimum temperatures were the highest on record for the south and central coasts of Western Australia extending to inland, central and northern South Australia and into adjacent western Queensland and southern Northern Territory.

The national mean temperature for all seasons for the financial year was above the 1961–90 average, with the warmest winter, the fifth-warmest spring, and the third-warmest summer on record since national observation began in 1910. Frequent low-intensity to severe heatwaves affected many areas of Australia, particularly large parts of Western Australia. However, the national mean temperature for April was 0.51 °C below average, the lowest since 2015.

More information is available in the Bureau's 2023–24 Climate and Water Statement.

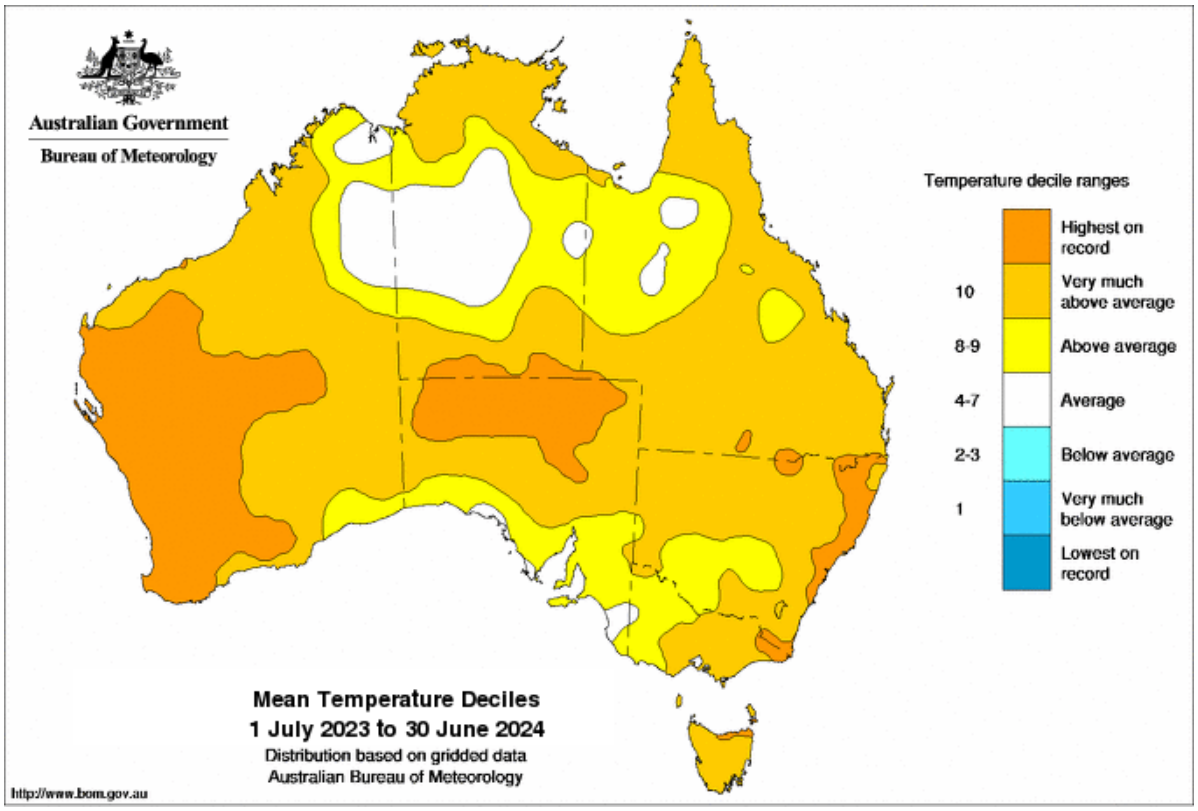

Figure 1.3 Mean daily temperature deciles for 2023–24 (based on all years of data since 1910)

1.4.3. Utility size

The size of a utility's customer base influences its performance on a range of indicators. This relationship may be causal, coincidental, or due to a related matter (for example, larger utilities may be subject to price regulation, unlike smaller utilities).

1.4.4. Sources of water

Two important drivers of performance are the sources of water used by a utility and the geographical relationship between the source and the urban centre it supplies. The combination and interaction of these drivers serve to create wide variations in engineering, operations and social challenges between utilities across the country.

The sources of water available to a utility are an important driver of several key performance indicators. Examples include the cost of treating water to an acceptable standard and supplying it to users affects the revenue collected by water utilities, their profitability (Finance indicators F3 and F24) and the strength of their water-usage pricing signal (Finance indicator F4).

Traditionally, Australians have relied on surface water and, to a lesser extent, groundwater to meet their urban consumption needs. The increased demand for urban water – resulting in a need to further develop and maintain ongoing water supply – is driven by many factors, including population growth and the reliability and security of existing sources (predominantly driven by water quality and climate variability). Financial, environmental and social factors reduce the feasibility of developing further traditional sources of water especially considering that most suitable dam sites have already been developed. In response to this situation, utilities and bulk water authorities across the country are developing non-traditional supply sources – such as desalinated and recycled water – while continuing to explore options for harvesting stormwater and rainwater.

The diversification of water sources affects the performance of utilities by increasing the cost of treating water to acceptable standards (to meet regulatory requirements) and to supply multiple water types to end users. For example, water from a 'protected' or 'closed' storage catchment is usually higher quality than water from an 'open' storage catchment and requires less treatment, which reduces the cost of supply.

The quality of water from groundwater sources varies greatly depending on the type and depth of the aquifer and has a significant impact on the extraction and treatment processes used and subsequent infrastructure and operational costs. Urban water supplied from recycled sources typically requires dual-pipe supply systems to separate recycled water from potable water, incurring greater infrastructure costs.

Figure 1.4 shows the annual supply from major sources of water, and the total supply, for utilities in each state and territory from 2019–20 to 2023–24.

- Water sourced from surface waters (that is, rivers, streams and dams; Water resource indicator W1) is the dominant sources of water for all states and territories (81.4% of the total water sourced from major sources of water) except Western Australia, where most of the water (39.3%) is sourced from groundwater (Water resource indicator W2).
- In 2023–24, total water sourced nationally increased by 3.9%, primarily due to a 13.6% increase in the total water sourced in South Australia and Western Australia. Extended hot weather and heatwave conditions throughout the year increased water demand across Australia, resulting in higher water supply requirements.

- The total surface water sourced on the national scale increased by 3.6%, mainly influenced by a 13.5% increase in the volume of surface water sourced in Western Australia. Nationally above average rainfall during summer and autumn increased the availability of surface water across the country. The increase in surface water use in Western Australia was driven by higher water demand from hot weather conditions. The volume of surface water sourced in New South Wales decreased by 1.6%, mainly due to below average streamflow in parts of north-eastern and south-eastern New South Wales.
- The volume of groundwater sourced increased by 9.5% from 2022–23 across the country. This was mainly driven by a 25.3% increase in the Northern Territory, where groundwater levels showed some improvements since 2021 due to above to very much above average rainfall, resulting in more bores reaching average levels compared to the previous year. These average levels, along with increased chlorine disinfection, allowed for higher groundwater extraction in the Northern Territory compared to the previous year. South Australia and New South Wales followed with 16.7% and 12.3% increases, respectively. Below average rainfall in southern South Australia and parts of north-eastern and south-eastern New South Wales resulted in below average streamflow, impacting surface water availability and leading to higher groundwater extraction.
- The volume of water sourced from desalinated water (Water resource indicator W3.1) in 2023–24 decreased (5.2%) for the fourth time since 2019–20 (18.3% decrease in 2020–21, 9.9% decrease in 2021–22, and 36.6% decrease in 2022–23). The decrease was mainly due to no need for desalinated water in Victoria[5] as well as a 48.2% decrease in desalinated water sourced in New South Wales. In 2022–23, major flooding affected the quality of surface water resources in New South Wales, significantly increasing reliance on desalinated water. With no such adverse impact in 2023–24, the use of desalinated water decreased from the previous year and returned to regular levels.
- In 2023–24, the use of desalinated water increased in Queensland by 31.3%, in Western Australia by 26.5%, and in South Australia by 0.8% compared to the previous year. Desalinated water use in Queensland returned to its regular levels in 2023–24 after an unusually low usage in the previous year, resulting in the highest increase percentage compared to the preceding year (from 7,834 ML in 2022–23 to 10,283 ML in 2023–24). The increase in desalinated water use in Western Australia was attributed to the integrated operational strategy, where surface water storages were not recovering due to below to very much below average streamflow (Perth's surface water storages experienced 10.3% decline from the previous year[6]). In the current year, as in the previous years, Tasmania, the Northern Territory and the Australian Capital Territory did not source any desalinated water.
- The volume of water sourced from recycled water (Water resource indicator W4/W26) in 2023–24 increased by 8.7%. This increase was primarily driven by an 82.4% increase in recycled water sourced in the Australian Capital Territory which was mainly attributed to non-residential customers. Additionally, recycled water uses in South Australia increased by 33.6% compared to the previous year, due to below average rainfall, a relatively dry summer, and an expansion of the customer base. Queensland and Western Australia were the only states to report a slight decrease of 2.4% in recycled water use compared to the previous year.

[5] Annual Report | Melbourne Water

[6] Financial year climate and water report 2023–24

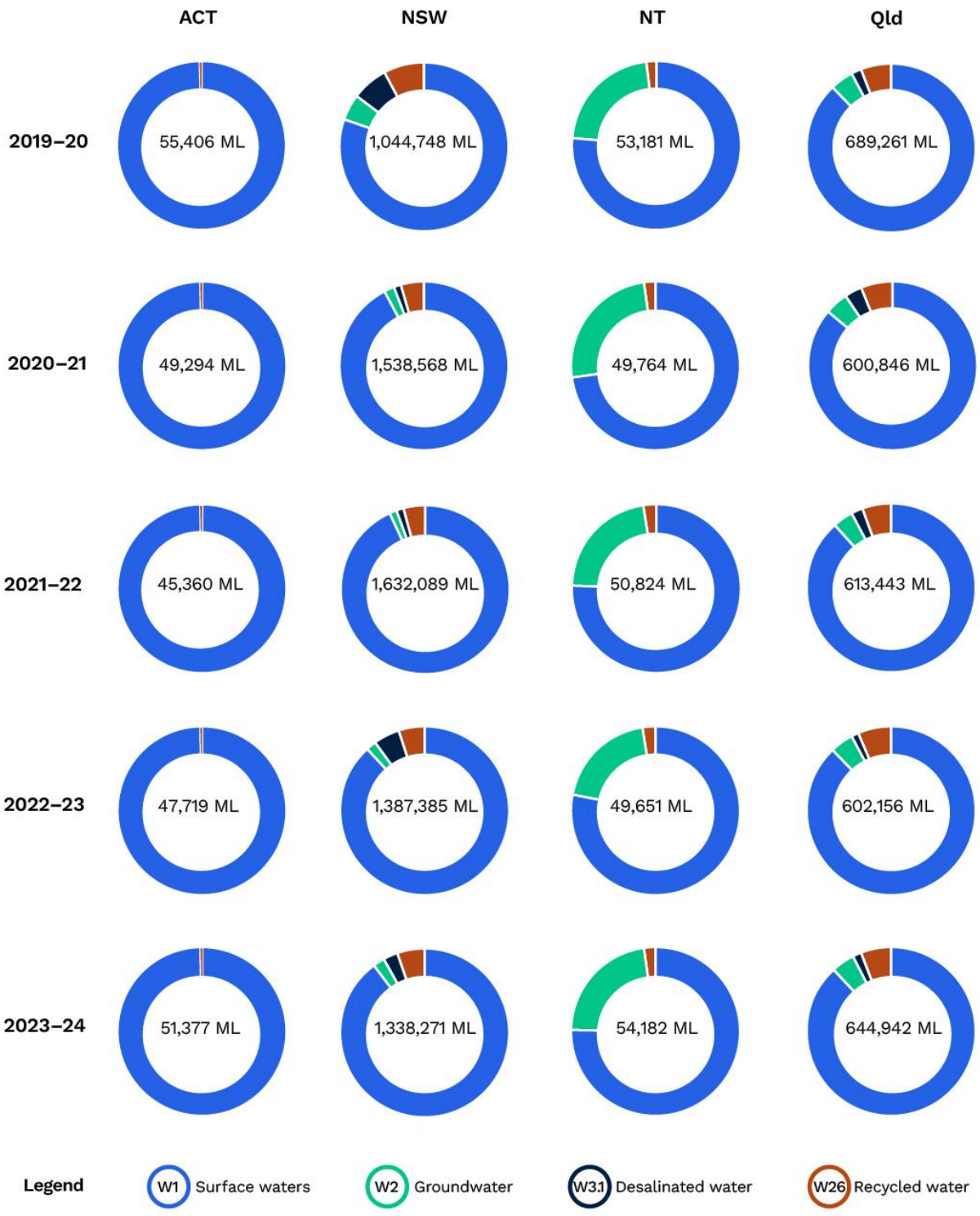

Figure 1.4a Water source breakdown in each state and territory, 2019–20 to 2023–24

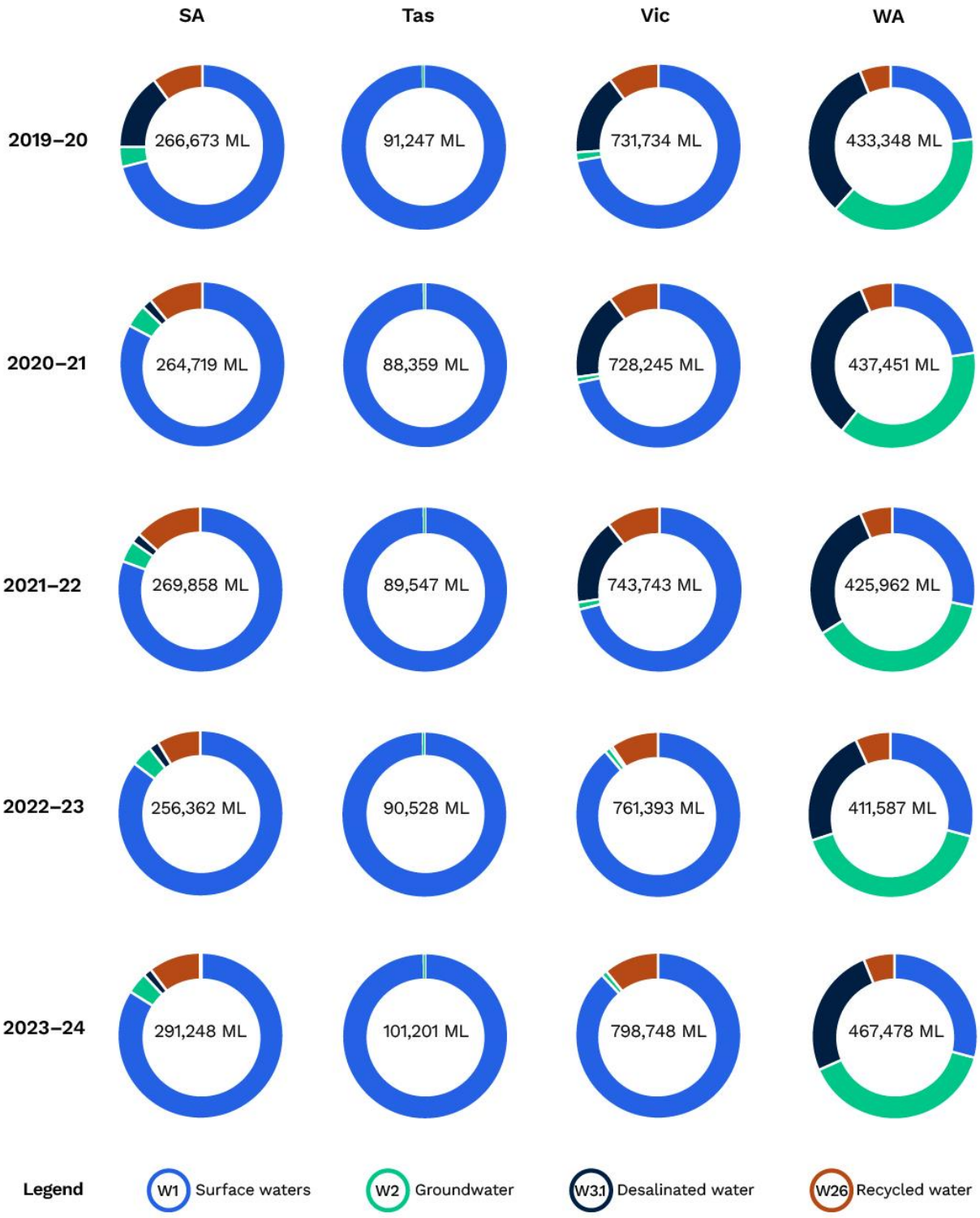

Figure 1.4b Water source breakdown in each state and territory, 2019–20 to 2023–24