2025/26 Desalinated Water Order Advice

Technical Analysis

March 2025

Table of contents

Summary

1. Melbourne Water is required to provide desalinated water order advice to the Victorian Government via the Department of Energy, Environment and Climate Action (DEECA) by 1 March every year.

2. This advice is based on an assessment of principles (paragraph 31) and considerations that seek to balance the water security benefits of a desalinated water order volume against the costs and risks given the uncertainty of future inflows into harvesting storages.

3. Melbourne Water worked with the metropolitan water businesses, which hold the Bulk Entitlements to water from the Victorian Desalination Project (VDP), to provide the order advice.

4. The desalinated water order advice provided by Melbourne Water to the Victorian Government was:

    - The required annual water volume for the 2025/26 supply period should be 50 GL.
    - There are no constrained months in the 2025/26 supply period.
    - Non-binding forecasts of 75 GL in the 2026/27 and 50 GL in the 2027/28 supply periods are appropriate.

Purpose

5. This report provides technical analysis supporting the 2025/26 desalinated water order advice.

Context

Background

6. The Melbourne water supply system includes 10 major reservoirs and associated catchments that are used to harvest and store water, a network of pipelines, pump stations, and tanks that are used to supply water to households and businesses across Melbourne and the surrounding region. The total system storage capacity of the 10 major reservoirs is 1,812 gigalitres[1] (GL). The VDP, located near Wonthaggi, is connected by an 84 kilometre underground transfer pipeline to Cardinia Reservoir in the Melbourne water supply system. The VDP is operated by Watersure under contract to AquaSure, and can supply up to 150 GL/year, or around one third of Melbourne's current annual water demand. Bulk entitlements to water produced by the VDP are held by the metropolitan water businesses (Greater Western Water, South East Water and Yarra Valley Water).

7. Melbourne's water storages supply water to the metropolitan water businesses; the regional water businesses (including Barwon Water, Westernport Water, Gippsland Water and South Gippsland Water); for the environment on behalf of the Victorian Environmental Water Holder (VEWH); and Southern Rural Water's irrigation customers.

8. Desalinated water is an important component in the portfolio of options to manage Melbourne's water security. Ordering desalinated water, alongside the State Government commitment to increase regional access by creating a shared south-central region pooled resource[2], also supports the security of the regional water corporations connected to the Melbourne system.

9. At 1 January 2025, around 58% of the water stored in Melbourne's water supply system was available for greater Melbourne. The rest was held by other water entitlement holders such as regional water businesses, the Victorian Environmental Water Holder (VEWH) and irrigators or is water that is inaccessible under normal operating conditions.

10. During severe drought years such as 2006/07, storage volumes can decline by about 16-24% of total system storage capacity in a 12-month period, depending on the desalinated water intake. As the annual supply capacity of the VDP can only meet a proportion of water demand, during drought periods water security is dependent on the volume of water already accumulated in water storage at the start of these periods.

[1] 1 gigalitre = 1 billion litres (the equivalent of around 400 Olympic swimming pools). In 2020/21, Melburnians (including those in the former Western Water) used 440 GL of water.
[2] Refer to the Victorian State Government's *Central and Gippsland Region Sustainable Water Strategy (2022)*

11. The aim of water supply system planning and operations is to use both catchment water sources and the VDP to build and maintain a buffer of water in storage while managing short and long term pricing impacts. A sufficient storage buffer is especially critical during severe drought periods. These periods could last for more than a decade, as experienced in the 1997-2009 Millennium Drought. Thomson Reservoir provides around 60% of total system storage capacity and has historically only filled to capacity in five of the forty-one years since it was completed in 1984. Thomson Reservoir is a large reservoir relative to its net inflow and while at capacity it provides a 'drought reserve' for Melbourne and the surrounding region against dry streamflow conditions, it can only fill from natural inflow. Mean annual streamflow into Thomson Reservoir is roughly one fifth of its capacity. Operation of the VDP reduces water transfers from Thomson and other reservoirs and therefore is key to enabling the water supply system to manage water volumes from year to year and over extended time frames.

12. Since the VDP was completed in 2012, 455 GL of desalinated water has been delivered from 2017 up to January 2025. Desalinated water orders since 2017 have significantly contributed to the overall higher storage positions since 2022.

13. Figure 1 shows historical water storage levels since 2012.

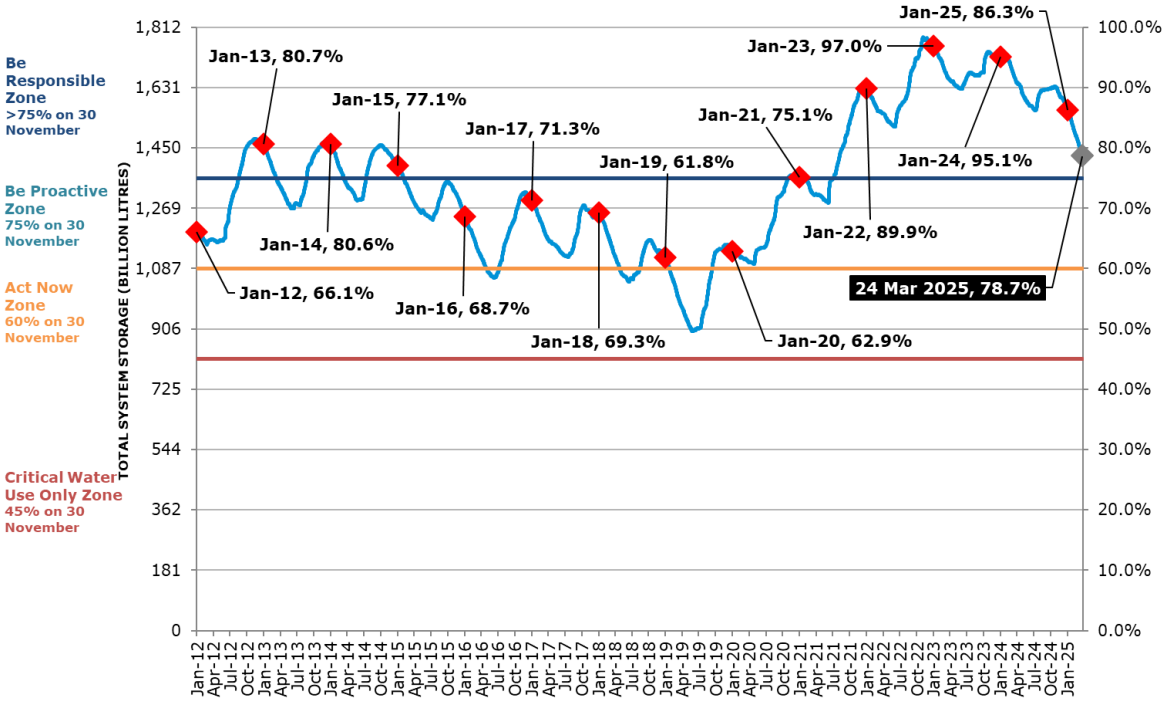

Figure 1: Historical water storage levels from January 2012 to March 2025

14. Melbourne's water storages were at 86.3% as at 1 January 2025, 8.8% lower than at the same time in 2024.

15. The contribution of previous desalinated water orders and above average streamflow conditions over the four years from 2020-2023 resulted in storages increasing over this period of time.

16. However, the 2025/26 desalination order advice was prepared in the context of drier conditions and lower streamflows during 2024, which have resulted in storages in the Melbourne water supply system being lower at the start of 2025 than at the same time in 2024.

17. Drier conditions and lower storages at the start of 2025 have also been echoed in other water supply systems of regional areas connected to the Melbourne system.

18. Storages in the larger Greater Western Water supply reservoirs of Rosslynne and Merrimu Reservoirs, owned by Southern Rural Water, were at 80% and 77% respectively as at 1 January 2025, which were 10% and 16% lower than at the same time in 2024. Greater Western Water has 80% share of storage in Merrimu Reservoir and 86% share of storage in Rosslynne Reservoir.

19. Geelong's water storages, owned and operated by Barwon Water, were at 55.1% on 1 January 2025, which is 22.7% lower than at the same time in 2024. Barwon Water uses the Melbourne to Geelong Pipeline (MGP) to help safeguard year-round water supply to its customers under dry conditions.

20. South Gippsland Water and Westernport Water both have regional areas connected to the 84-kilometer two-way pipeline between the VDP and Melbourne Water's Cardinia Reservoir, and can both be supplied directly with desalinated water when the VDP is in operation. South Gippsland Water's total storage volume was at 70% in January 2025, about 20% lower than the previous year. Westernport Water's Candowie Reservoir was at 55% on 1 January 2025, about 35% lower than the previous year.

21. Over the past ten years (2015-2024):

    - Population in Melbourne supplied by the three metropolitan water businesses has grown to a total of approximately 5 million people.
    - Average daily residential water use has remained stable from 161 litres per person per day in 2014/15 to 163 litres per person per day in 2023/24.
    - Due to population growth and additional supply needs to regional areas, Melbourne's water demand has grown by approximately 13% over 10 years, from 415 GL/year in 2014/15 to 471 GL/year in 2023/24.

22. A greater volume of water in storage improves system resilience against variability in climate, demand and bushfires and enables deferring system augmentations, however, longer term dry conditions do still present a risk for the system. Higher, growing annual demands will result in storages providing less of a buffer to dry conditions over time.

Melbourne's strategic water resource planning

23. In 2023, Melbourne Water and the metropolitan water businesses published the *Greater Melbourne Urban Water and System Strategy*, which presents a system view of water resource management across Melbourne and the surrounding region over the following 50 years. The strategy includes long-term water supply outlooks for streamflow scenarios described in the Department of Energy,

Environment and Climate Change[3] (DEECA) *Guidelines for Assessing the Impact of Climate Change on Water Availability in Victoria*.

24. These long-term streamflow scenarios under climate change show that the reliable yield of the water supply system will continue to decline over time. Although storages are currently at higher levels, the reliable yield of the water supply system from the surface water catchments is expected to fall. The VDP will be increasingly important in providing water security for Melbourne and regional areas for a growing population and in managing the impacts of the changing and variable climate. The timing and severity of future extended drought sequences is uncertain, so preparedness for such events requires planning and operating the water supply system to maintain the buffer of water in storage that has been established in recent years, subject to pricing impacts.

Desalinated water order advice

25. The State of Victoria is required to place a desalinated water order with AquaSure by 1 April each year under the *Project Deed* between the two parties. Prior to this, the *Water Interface Agreement* between the Minister for Water, Melbourne Water, and the Secretary of DEECA requires Melbourne Water to provide the State of Victoria (represented by DEECA) with the following desalinated water order advice by 1 March:

    a. Its opinion of the volume of desalinated water required for the next financial year (i.e. 2025/26).

    b. Its opinion of the constrained months[4] (if any) that it considers should be subject to a constrained month cap and the proposed volume of such caps.

    c. A non-binding forecast of the quantity of desalinated water required for the next two financial years (i.e. 2026/27 and 2027/28).

26. Melbourne Water worked with the metropolitan water businesses, which hold the Bulk Entitlements to water from the VDP, to coordinate the process of consultation and deliver the modelling and technical analysis required to support the development of the 2025/26 desalinated water order advice. Other water entitlement holders across the water grid were also consulted to ensure the advice reflected forecast demands from the Melbourne system.

Water Outlook zones

27. The desalinated water order advice is a key annual planning activity for supporting the short and long-term water security for Melbourne and the surrounding region. The annual preparation of the advice follows the publication of the *Water Outlook* by Melbourne Water and the metropolitan water businesses on 1 December each year, and is linked to this process through the use of the Water Outlook zones in preparing the advice.

[3] The *Guidelines* were published by DEECA's predecessor, the Department of Environment, Land, Water and Planning.
[4] Subject to conditions specified in the *Project Deed*, the State may specify the maximum volume of desalinated water which can be delivered (i.e. a constrained month cap) during the months of August, September, October and/or November.

28. The metropolitan water businesses' Drought Preparedness Plans were reviewed in 2021 and specify a four-zone adaptive framework for monitoring water security based on the volume of water in Melbourne's storages on 30 November each year, as shown in Figure 2.

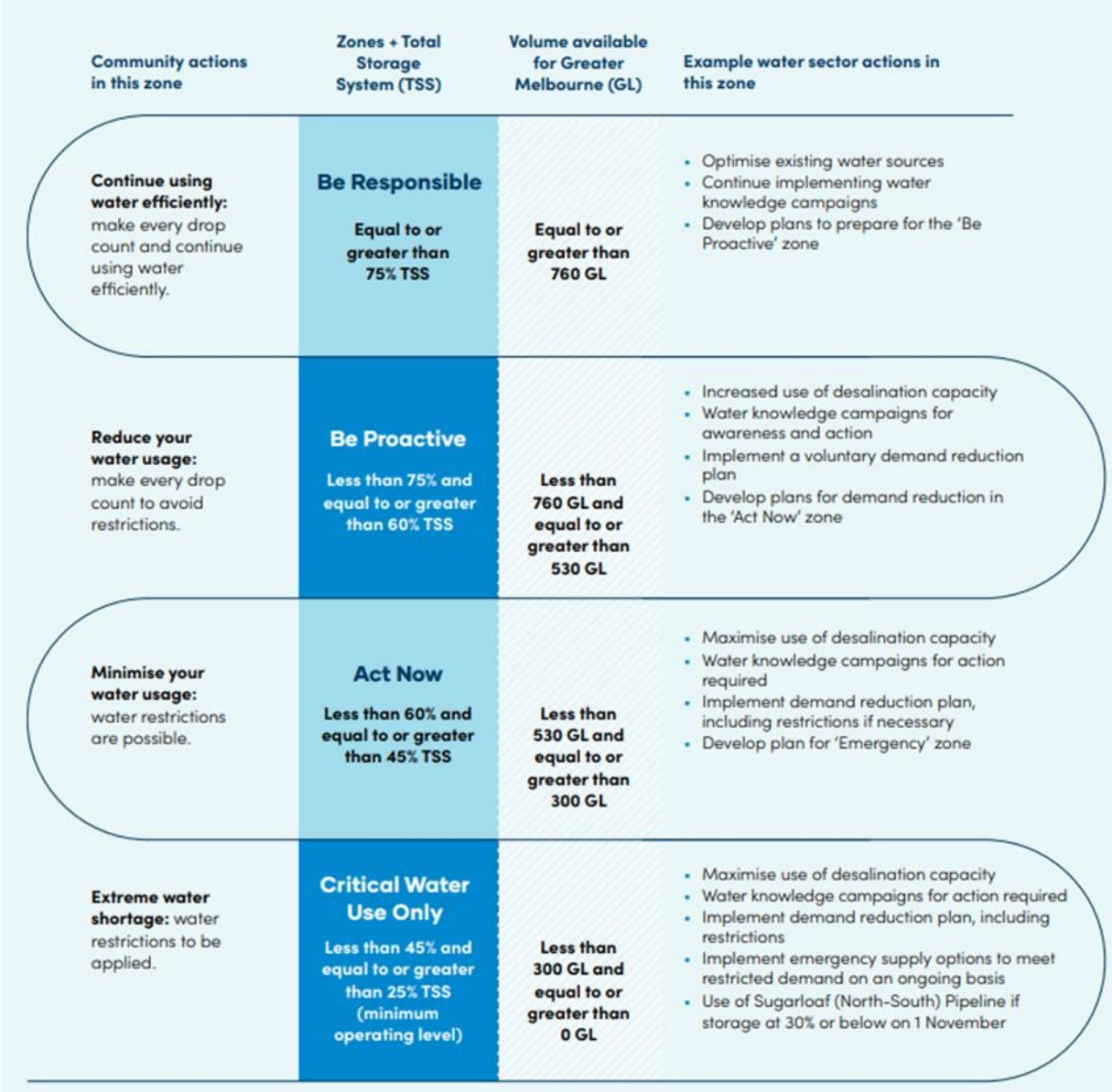

Figure 2: Melbourne's water outlook zones

As illustrated in Figure 1, the end of spring is typically when Melbourne's water storage volumes transition from filling during the cooler, wetter months, to falling during the warmer, drier months.

Notable features of the framework are:

- A Water Outlook is published by 1 December each year by Melbourne Water and the metropolitan water businesses to document and communicate water security status and actions needed in the short to medium term with reference to the four-zone adaptive framework.

- When storages are in the Be Responsible Zone, storages are managed proactively for possible future drought events including ensuring water is used efficiently and drought response measures are developed.
- When storages are in the Be Proactive and Act Now Zone, actions are taken to ensure supply is available under severe and extended drought conditions for up to five years. Stages 1 and 2 of the metropolitan water businesses' water restrictions by-laws may also be used in these zones, although water restrictions can have significant social and economic impacts, so other approaches (e.g. voluntary water efficiency programs) may be implemented if similar reductions in water use can be achieved.
- Actions are taken to ensure water storages do not enter the Critical Water Use Only Zone except in extreme circumstances. Stages 3 and 4 of the metropolitan water businesses' water restriction by-laws are available to be used in such a severe event.
- Water may be ordered from the VDP in any of the four zones. The amount ordered is based on order advice provided by Melbourne Water and the metropolitan water businesses each year following detailed analysis that considers and balances the five principles and other factors (discussed below).
- In the development of the desalinated water order advice, the Water Outlook zones are used to measure potential future water security by comparing projections of future water storage levels against the four zones.

29. The 2025 Water Outlook for Melbourne, published on 1 December 2024, noted that storages were in the Be Responsible Zone (88.4%) and secure for the coming year.

Principles

30. Consistent with the approach established by the water businesses and used in previous years, the 2025/26 desalinated water order advice is based around five principles. These were developed and assessed by the water businesses to balance the benefits of using the VDP in maintaining the short and long-term security of supply to customers against the costs of placing an order and the potential for foregone water harvest[5]. Short-term water security is maintained by avoiding going into the Critical Water Use Only Zone, and minimising the risk of going into the Be Proactive Zone, while long-term water security is achieved by building storage recovery over a number of years when there is sufficient capacity available in the reservoirs and maintaining higher storage volumes, when storages volumes are high. The advice is based on the water businesses assessing an appropriate balance across these principles. The advice is prepared recognising that while the first year order is contractually binding for the financial year, there is the opportunity to revisit the volume required in each of the second and third years (non-binding advice), as part of the annual planning and

[5] 'Foregone harvest' is defined as the modelled additional flow over dam spillways from the Melbourne water supply system and/or reduced harvest into Sugarloaf Reservoir for each modelled streamflow sequence due to the desalinated water order volumes supplied. All water may not be harvested from smaller storages and weirs in wetter years.

ordering cycle. This allows adaptation based on the storage levels and outlooks at the time. The technical assessments of different potential desalinated water order volumes for 2025/26 described later in this document take this ability to adapt subsequent order volumes into account.

31. The intent of the principles is to provide for water security for Melbourne by avoiding both storages falling to low levels, and taking into account the potential for foregoing harvest of lower cost water from within the system in wetter years (although this can potentially provide environmental benefits for downstream waterways). In satisfying these, customer impacts should be minimised. The principles are:

    - **Principle 1: Chance of storage volume falling into the Critical Water Use Only Zone**
      Storages should remain above the Critical Water Use Only Zone described in the metropolitan water businesses' Drought Preparedness Plans on 30 November 2025, 30 November 2026 and 30 November 2027 under a severe drought sequence, which is defined as the driest sequence among the modelled streamflow sequences.
    - **Principle 2: Chance of storage volume falling into the Be Proactive Zone**
      Storages should remain above the Be Proactive Zone described in the metropolitan water businesses' Drought Preparedness Plans on 30 November 2025, 30 November 2026 and 30 November 2027 under 90 per cent of modelled streamflow sequences.
    - **Principle 3: Storage Recovery**
      Storages should display a recovery trend such that the median (50th percentile) modelled total system storage levels across the modelled streamflow sequences increase in 2025/26, 2026/27 and 2027/28.
    - **Principle 4: Risk of desalinated water causing avoidable foregone harvest**
      Foregone water harvest should be less than 12.5 GL/year for at least 50% of modelled streamflow sequences, and less than 25 GL/year for at least 90% of modelled streamflow sequences in 2025/26, 2026/27 and 2027/28.
    - **Principle 5: Customer impacts**
      The impacts on the metropolitan water businesses' customers' bills should be minimised while providing an acceptable security of supply.

32. Potential desalinated water order pathways were assessed against the five principles using detailed technical analysis described later in this report.

Technical analysis inputs and assumptions

Initial water storage levels

33. Water resource modelling for the 2025/26 advice examines possible future water storage levels for different desalinated water order volumes and operational conditions based on storage volumes observed on 30 November 2024 (1,600 GL or 88.3%). Approximately 154 GL of the water in storage on 1 December 2024 was allocated to entitlement holders other than the metropolitan water businesses, including the regional water businesses, the Victorian Environmental Water Holder, and Southern Rural Water. The distribution of water across the 10 major storage reservoirs in the Melbourne water supply system on 30 November 2024 is shown in Table 1. Water resource modelling supporting the desalinated water order advice considers the range of possible streamflow conditions into the reservoirs and the expected demands associated with all entitlement holders in the Melbourne system for the desalinated water order advice period.

Table 1: Distribution of water across the 10 major storage reservoirs in the Melbourne water supply system on 30 November 2024

Reservoir	Capacity at full supply (ML)	Volume (ML)	% Full
Thomson	1,068,000	985,535	92.3%
Upper Yarra	200,579	172,027	85.8%
O'Shannassy	3,123	3,169[6]	100%
Maroondah	22,179	12,301	55.5%
Sugarloaf	96,253	92,862	96.5%
Yan Yean	30,266	26,850	82.2%
Greenvale	26,839	22,053	82.2%
Silvan	40,445	35,331	87.4%
Cardinia	286,911	212,530	74.1%
Tarago	37,580	37,706[6]	100%
Total	**1,812,175**	**1,600,364**	**88.3%**

Streamflow scenario

34. This technical analysis report was based on modelling with the 'Post-1997 step climate change' streamflow scenario described in the *2020 Guidelines for*

[6] Reservoir was above capacity while water was flowing over the spillway.

Assessing the Impact of Climate Change on Water Availability in Victoria. The use of the 'Post-1997 step climate change' streamflow scenario is representative of streamflow conditions observed in recent history and therefore appropriate for developing the three year desalinated water order advice. The methodology used to establish this streamflow scenario results in consideration of some potential drought sequences more severe than those that have occurred historically.

35. The 'Post-1997 step climate change' adopts the observed streamflow from July 1913 to June 1997 scaled to match the statistical properties of the period July 1997 to June 2024. The 2023/24 streamflow at Melbourne's four major harvesting reservoirs was 515 GL. The difference between the observed historical streamflow (grey bars) and the adjusted streamflow (orange bars) are illustrated in Figure 3. In the water resource modelling, the 111 years of streamflow data, representing post-1997 step climate change, are used to create 111 streamflow replicates (also referred to as streamflow sequences), that are used to assess the performance of potential desalinated water order pathways against a range of potential streamflow conditions.

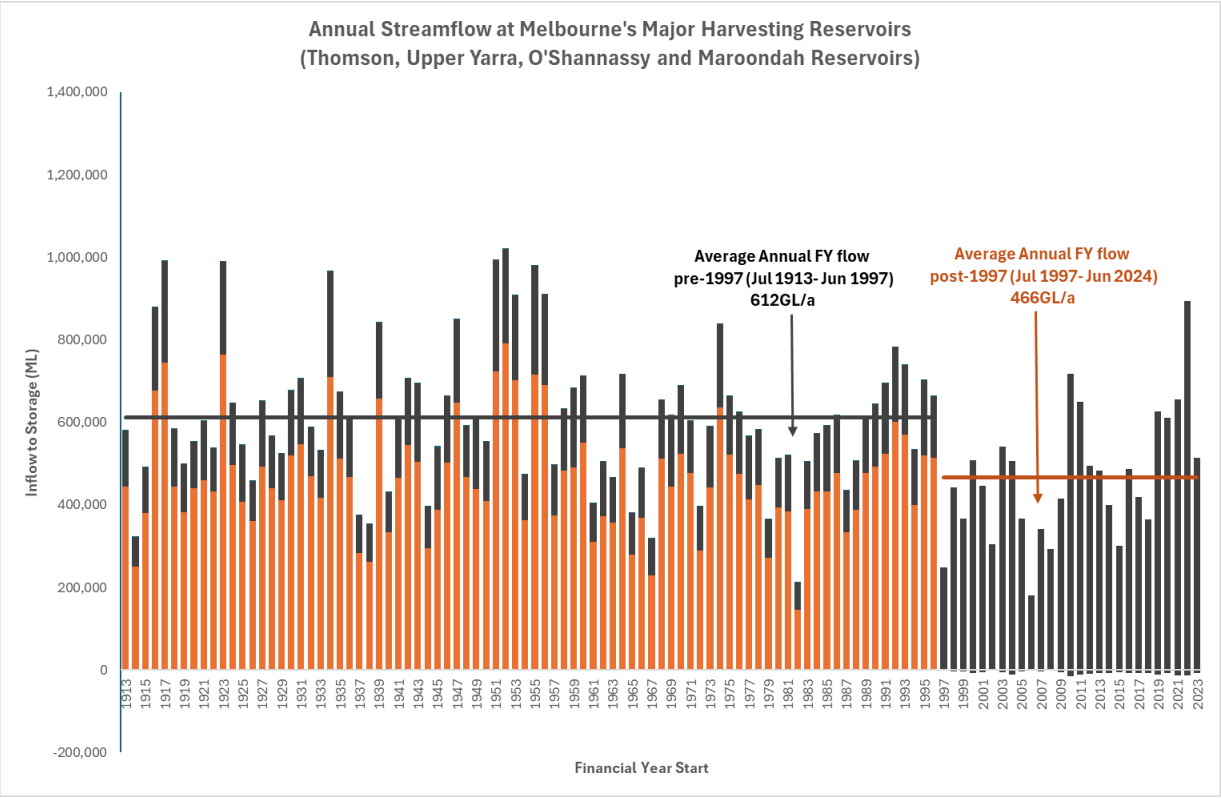

Figure 3: 'Post-1997 step climate change' streamflow scenario

Demand forecasts

36. To support the desalinated water order advice development process, the metropolitan and regional water businesses provided demand forecasts. The demand forecasts for the three years covered by the advice are outlined in Table 2. These demand forecasts include expected water savings from the Target 150 program and Permanent Water-Saving Rules. In the water resources modelling, the metropolitan demand forecasts are adjusted in each modelled year using a

climate index algorithm to reflect the variability in demand typically observed in warmer and drier years, cooler and wetter years and seasonal variability in demand during the year. The average annual demand forecasts for the metropolitan water businesses outlined in Table 2 reflect the impact of recent observed and forecast growth in Melbourne's population.

Table 2: Demand forecasts provided by the metropolitan and regional water businesses

Year	Metropolitan water businesses (GL)	Regional water businesses (GL)	Total (GL)
2025/26	456	21	477
2026/27	461	24	484
2027/28	464	27	491

37. The water demand forecasts in Table 2 do not include environmental water releases from water entitlements held by the Victorian Environmental Water Holder for the Yarra, Tarago and Thomson basins. For modelling purposes, it was assumed that the Victorian Environmental Water Holder will use 2024/25 planned releases and the annual allocation each year thereafter. The environmental allocations for key modelled river systems include:

    - Yarra River system: 17 GL/year
    - Thomson River system: 10 GL/year plus 3.9% of inflows to Thomson Reservoir (under the 'Post-1997 step climate change' streamflow scenario, 3.9% of inflows to Thomson Reservoir is approximately 7 GL/year on average).
    - Tarago River system: 10.3% of inflows to Tarago Reservoir

38. The water demand forecasts in Table 2 also do not include rural irrigation water releases from water entitlements held by Southern Rural Water. For modelling purposes, it is assumed that Southern Rural Water uses their water entitlement of 6% of inflows to Thomson Reservoir each year (under the 'Post-1997 step climate change' streamflow scenario, 6% of inflows to Thomson Reservoir is approximately 11 GL/year on average).

Operational considerations

39. The technical analysis supporting the 2025/26 desalinated water order advice also takes into account planned asset and operational factors including:

    - **Cardinia Reservoir:** The modelling includes a reduced maximum operating volume of 240 GL (full supply level approximately 287 GL), consistent with dam management operating conditions and also includes assumptions for temporary drawdown to 208 GL to support future capital works currently planned to commence by June 2026. Cardinia Reservoir is required to store

desalinated water delivered as well as wet season streamflow from the upper Yarra River tributaries.

- **Upper Yarra Reservoir:** The modelling includes a reduced maximum operating volume of 185 GL (full supply level approximately 200 GL), consistent with system management rules, and also includes assumptions for temporary drawdown to 155 GL between February and October 2025, to undertake maintenance work on the spillway and outlet towers.

40. Desalinated water orders are modelled assuming delivery from 1 July at the VDP's maximum capacity until the order has been completed. For larger orders, a reduced output from the VDP is assumed in February.

Cost information

41. To support water resource modelling and price modelling, DEECA provided estimates of costs associated with each of the desalinated water order volume options based on the best available information.

Technical analysis results

42. Water resource modelling was undertaken to support the 2025/26 desalinated water order advice, which provides an outlook from 1 December 2024 to 30 June 2028, covering the three financial years for which advice is required under the *Water Interface Agreement*. This modelling process considers all possible desalinated water orders that could be placed under the *Project Deed* during this three year period (including 0 GL), and identifies the desalinated water orders most likely to lead to outcomes consistent with the principles described in paragraph 31.

43. The water resources modelling separately considers each of the seven possible orders from 0 to 150 GL[7] in the first year of the three-year desalinated water order advice. For each of these seven possible first year (2025/26) orders, Melbourne's water supply system is modelled over the next three and a half years under 111 different streamflow sequences. For each streamflow sequence, the model selects the second year (2026/27) and third year (2027/28) desalinated water orders that best meet the five principles under that particular sequence.

44. The water resources modelling results are summarised in Table 3. These results reflect, for a given 2025/26 desalinated water order volume, the remaining risks after taking into account the potential to increase or decrease desalinated water orders in 2026/27 and 2027/28 in response to observed conditions.

[7] The annual volumes that can be ordered are 0 GL, 15 GL, 50 GL, 75 GL, 100 GL, 125 GL and 150 GL as documented in the Victorian Desalination Project Deed

Table 3: Summary of assessment against the five principles for all potential 2025/26 desalinated water order volumes

2025/26 desalinated water order volume (GL)	Principle 1			Principle 2			Principle 4						Principle 3			Principle 5			
	Percentage of streamflow replicates that fall into the Critical Water Use Only Zone (below 45% on 30 November)			Percentage of streamflow replicates that fall into the Be Proactive Zone (below 75% on 30 November)			10th percentile foregone harvest (90% of streamflow replicates have foregone harvest less than this volume) (GL)			50th percentile (median) foregone harvest (50% of streamflow replicates have foregone harvest less than this volume) (GL)			50th percentile (median) storage recovery (50% of streamflow replicates have greater storage recovery than this volume) (GL)			Average discounted cost of producing desalinated water over the three year outlook period ($M)	Average order volume across all streamflow replicates (GL)		Average change in order volume between years across all streamflow replicates
	Principle target: 0%			Principle target: Less than 10%			Principle target: Less than 25 GL			Principle target: Less than 12.5 GL			Principle target: More than 0 GL			Principle target: Minimise impacts (magnitude and variability) on customer bills in all three years			
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	All three years	Year 2	Year 3	All three years
0 GL	0	0	0	7	14	14	0	11	29	0	2	6	-69	4	-39	88	78	47	43
15 GL	0	0	0	7	14	14	11	12	25	0	2	5	-54	-4	-37	93	73	44	43
50 GL	0	0	0	5	12	12	44	16	31	1	2	4	-32	-9	-49	102	64	35	50
75 GL	0	0	0	5	10	11	69	25	33	6	4	4	-18	-24	-55	114	59	31	59
100 GL	0	0	0	5	9	9	83	35	32	11	5	3	2	-30	-54	124	53	29	69
125 GL	0	0	0	5	7	7	88	57	38	11	5	4	23	-33	-56	134	48	23	81
150 GL	0	0	0	5	6	7	89	77	40	11	11	4	48	-51	-56	148	41	19	94

45. Table 3 suggests that:

- **Principle 1 - Avoid being in the Critical Water Use Only Zone:** For all water order options in 2025/26, including a zero order, the assessed risk of storages falling into the Critical Water Use Only Zone on 30 November is 0% in all three years of the advice period.
- **Principle 2 – Minimise risk of being in the Be Proactive Zone:**
  - For all 2025/26 orders, there is a less than 10% chance that storages will drop into the Be Proactive Zone on 30 November 2026.
  - For 2025/26 orders of 0 GL and 15 GL, there is a 14% probability of storages dropping into the Be Proactive Zone by 30 November 2026 and 2027.
  - For 2025/26 orders of 50 GL and 75 GL, the probability of dropping into the Be Proactive Zone decreases to 10 – 12% by 30 November 2026 and 2027.
  - For 2025/26 orders of 100 GL or higher, there is a less than 10% chance that storages will drop into the Be Proactive Zone by 30 November 2026 and 2027.
- **Principle 3 – Maximise storage recovery:** At least 100 GL is required in 2025/26 to achieve a 50% chance of storages being maintained in 2025/26.
- **Principle 4 – Minimise foregone harvest:** The median foregone harvest for all volumes over the three year advice period is within the benchmark range. In 2025/26, the volume across all order volumes varies between 0 GL to 11 GL. For 10% of the modelled streamflows with the highest foregone harvest, these volumes are greater than 44 GL to 89 GL for orders 50 GL and above.
- **Principle 5 – Minimise customers' bill impacts** Low order volumes in 2025/26 increase the likelihood that higher volumes (and customer bill increases) will be required in 2026/27 and subsequent years to meet the principles. Large increases in order volume changes from one year to the next increase the risk of bill shock for customers compared to stable order volumes or smaller increments.

46. Figure 4 illustrates a range of potential future water storage levels over the next three financial years for the 111 streamflow sequences. Figure 4 assumes that 50 GL is ordered in 2025/26, followed by orders in 2026/27 and 2027/28 adapted for each streamflow sequence as per paragraph 40.

47. The green line in Figure 4 shows the projected water storage levels if a particularly dry historical streamflow sequence (2006/07, 2007/08 and 2008/09) occurs over the next three financial years. For this particular streamflow sequence, the modelling suggests that it could be appropriate to order 150 GL in both 2026/27 and 2027/28 to respond to falling water storage levels resulting from severe dry conditions.

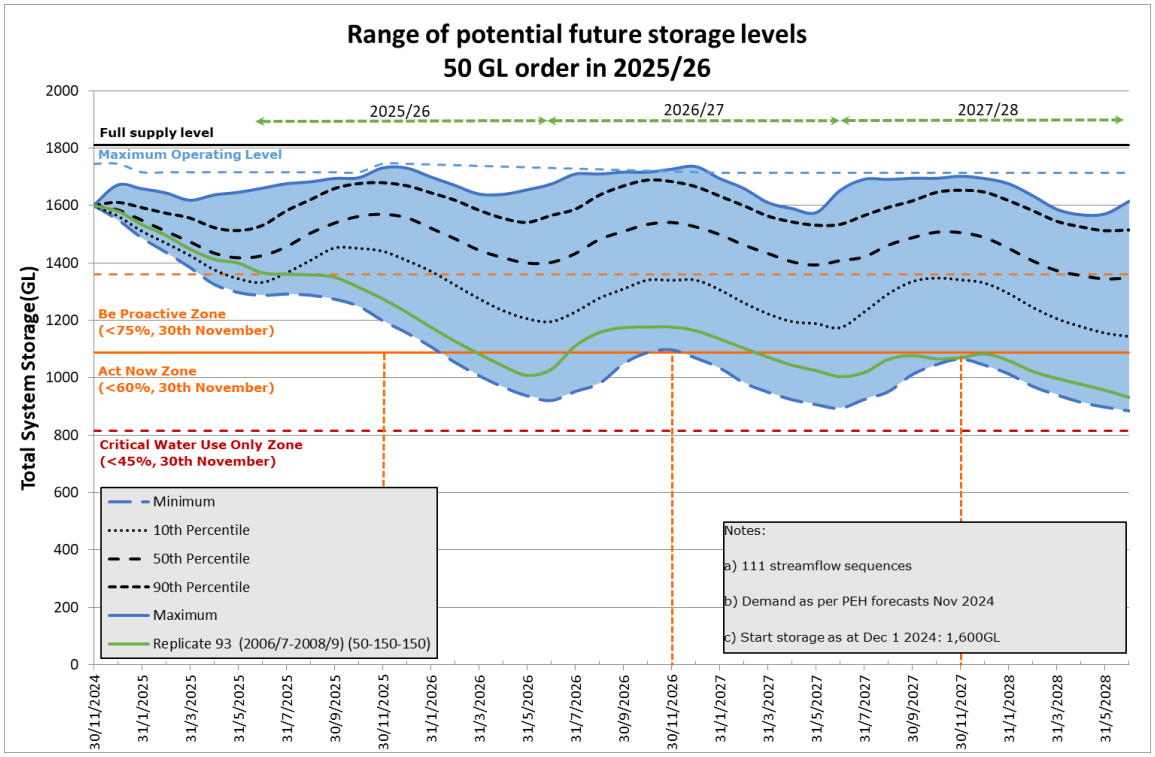

Figure 4: Modelled projection of potential future water storage levels assuming a 50 GL order in 2025/26

Other considerations

Value of Water in Storage

48. Over the long term, water supply system yield is projected to decrease as a result of changing climate conditions while demand is projected to continue to increase. As a result:

- Water storage levels will, on average, show a decreasing trend without regular water volumes provided by the VDP.
- Non-zero desalinated water orders will therefore be necessary to maintain or recover storage levels. Depending on the sequencing of future wet and dry years, average orders will reflect an increasing use of the VDP.
- Prior to the VDP's full capacity being regularly required to supply growing demand in future, larger orders when there is storage capacity can be used to build a buffer of water in storage for drought resilience.
- Maintaining high storage volumes increases Melbourne's resilience to extreme climate events such as droughts, reduces the severity and impact of water restrictions, and will assist in meeting the growing annual demand for water while urban water corporations undertake early readiness activities for future water supply options.
- Augmentation to the water supply system will become necessary as the difference between water demand and yield diminishes and water security cannot be maintained.

Reservoir spillway flows

49. Given relatively high initial water storage volumes and the distribution of water across the major water storages, Principle 4, the risk of desalinated water causing avoidable foregone harvest and reservoir spills, was a key consideration in the technical analysis. In most years, some spillway flows occur from the smaller reservoirs in the system regardless of any desalinated water orders.

50. The 2025/26 order advice gave detailed consideration to order volumes that balanced maintaining drought reserves in Thomson Reservoir while managing the possible risk of the reservoir reaching full capacity and spilling over the order advice period. Analysis highlighted that there is potential of spillway flows from Thomson Reservoir in 2025/26, regardless of the order volume placed.

Climate outlooks

51. The desalinated water order advice was informed by the Bureau of Meteorology's seasonal streamflow forecasts and southern hemisphere monitoring updates issued during January and February 2024.

52. The southern hemisphere modelling update issued on 21 January 2025 indicated that:

    - The El Niño–Southern Oscillation (ENSO) was considered neutral. Most Bureau climatic models predict neutral ENSO conditions by March 2025, and international models surveyed by the Bureau indicate neutral ENSO conditions until at least June 2025.
    - The Indian Ocean Dipole was neutral, and the Bureau predicts the IOD to remain neutral through to May 2025.

53. More generally, the Bureau of Meteorology has projected slightly below average rainfall from February to April 2025.

54. The seasonal streamflow forecasts for Melbourne's four major harvesting storages (issued mid-January 2025 and illustrated in Table 4) generally indicated mostly low flows for the period January to March 2025.

Table 4: Seasonal streamflow forecast for Melbourne's four major harvesting storages for January to March 2025 (Source: Australian Government Bureau of Meteorology)

4 major harvesting reservoirs	Jan – Mar 2025 (based on forecast provided by the BoM)
Thomson	Low flow
Upper Yarra	Low flow
O'Shannassy	Low flow
Maroondah (Watts River & Graceburn Creek)	Low flow (Watts) Median flow (Graceburn)

55. These outlooks do not extend over the three years of the desalinated water order advice period, but indicate relatively short term conditions. The above forecasts have therefore not significantly influenced the advice for 2025/26. However, the advice has considered a broad range of potential climate conditions for the three year period.

Technical outcomes

56. Order volumes of 50 GL and 75 GL were considered for the 2025/26 desalinated water order advice in more detail. These options provided water security by managing the risk of entering the Critical Water Use Only and Be Proactive Zones, minimised foregone harvest and major reservoirs reaching capacity and maintains a buffer against the impacts of future drought. These two potential order volumes meet most of the desalinated water order advice principles in 2025/26.

57. A 50 GL order has a smaller customer bill increase than a 75 GL order in 2025/26.

58. To best balance the need to manage water security risks, customer bill impacts and the risk of foregone harvest while maintaining a storage buffer, desalinated water order advice of 50 GL for 2025/26 is most aligned with the desalinated water order advice principles. Thereafter, non-binding forecasts of 75 GL in 2026/27 and 50 GL in 2027/28 are recommended based on average order volumes across the modelling replicates.

Conclusion

59. Consistent with the requirements of the *Water Interface Agreement* described in paragraph 25, the following desalinated water order advice has been provided by Melbourne Water to the Victorian Government:

    - The required annual water volume for the 2025/26 supply period should be 50 GL.
    - There are no constrained months in the 2025/26 supply period.
    - Non-binding forecasts of 75 GL in 2026/27 and 50 GL in 2027/28 supply periods are appropriate.