Victorian Annual Water Outlook

Covering the period February to November 2023 Published Feb-2023







Energy, Environment and Climate Action

Acknowledgements

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



DEECA kindly acknowledges the efforts of the urban and rural water corporations of Victoria.

DEECA is grateful for the input of the Victorian Environmental Water Holder and the provision of data by the Australian Bureau of Meteorology.

DEECA thanks the Gunditj Mirring Traditional Owners Aboriginal Corporation and Gunaikurnai Land and Waters Aboriginal Corporation for their contributions.

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Ministerial foreword

Spring and Summer came to Victoria in 2022-2023 amidst a third consecutive La Niña weather event that brought above average rainfall and devastating floods to many parts of the state - impacting rural, regional, and metropolitan communities. These floods caused widespread loss and damage, and their effects will continue for some time as recovery and rebuilding efforts go on.

I extend my ongoing thanks and respect to the many people, communities, businesses and organisations who have worked tirelessly to meet the challenges of these floods. Water corporations were given an extension to deliver their respective annual water outlooks which freed up much-needed time to respond to these flooding events. Their efforts in mobilising and deploying people and resources as part of relief and recovery work should also not go unnoticed.

As we move into 2023, the state's water supplies are in a secure position with water restrictions not expected anywhere. Melbourne's water supply is in the best position it's been in for a long time – with storage volumes close to 100% storage capacity.

This season the Wimmera-Glenelg system reached its greatest volume in storage since before the Millennium Drought. While in northern Victoria, all water shareholders received 100% allocation against both their high- and low-reliability entitlements for the first time since these entitlements were established in their current form in 2007. However, the challenges and complexities of creating and maintaining a reliable water supply for our cities and towns are increasing, particularly as our population grows. Victorians know all too well that natural climate variability can result in extremely dry conditions like those experienced from 1997 to 2009 with the Millennium Drought. Climate change, exacerbating these already variable climatic conditions, is projected to lead to further warming and drying in Victoria. We must prepare accordingly.

Victorians are rightly proud of our water conservation efforts. Permanent Water Saving Rules are continuing to drive smart water use, and water efficiency initiatives are promoted in a variety of ways including through the Schools Water Efficiency Program, delivered through 1300 primary and secondary schools across Victoria. These efforts will be of even greater significance in Autumn when rainfall is expected to drop below average levels.

The ongoing work of our water agencies to strengthen our water delivery systems also continues, further bolstering our water security. Traditional Owners in Victoria's southwest received a water entitlement for the first time in March, with the Gunditj Mirring Traditional Owners Aboriginal Corporation receiving 2.5 gigalitres of unallocated water in the Palawarra (Fitzroy River) system. The nation-leading *Water is Life: Traditional Owner Access to Water Roadmap* represents the first steps towards acknowledging past water injustices with a new focus on the role of Traditional Owners in water management and is testament to the hard work and leadership of First Nations communities and representatives.

The many complexities of the past year and the importance of planning and preparation are reflected in this Annual Water Outlook and it will serve us well in planning for and managing future challenges across Victoria.

The Hon. Harriet Shing MP Minister for Water



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1. Introduction

The aim of the Victorian Annual Water Outlook (the Outlook) is to keep Victorians informed about the state's water supplies for the coming year. It also outlines the contingency plans to manage any water shortages that may arise.

Each year, the Outlook synthesises the information provided in the annual water outlooks prepared by Victoria's 18 urban and rural water corporations for the 12-month period from December through to the following November.

This year, the publication of some water corporations' annual water outlooks was delayed from 1 December 2022 until 31 January 2023. This was in response to the major flooding across parts of Victoria and to support their flood response actions.

The release of this Outlook was deferred until February to accommodate the extension for water corporations.

Due to the highly variable nature of Victoria's climate, 'average', 'dry' and 'worst on record' climate scenario modelling is used to identify potential water security risks and understand the vulnerabilities of each system. The individual water corporations' annual water outlooks present this information and report on the current condition of each water supply system, predict future water availability where possible, and outline strategies to meet customer demand. Each water corporation makes its annual water outlook available on its website.

The Outlook takes this information and provides a state-wide overview of:

- the conditions that can be expected this coming year,
- the seasonal conditions already experienced in 2022 and the beginning of 2023, and
- environmental water security across the state.

Note: Data provided within this report was correct as at 31 January 2023 or at the date specified.

2. Snapshot

Overview



A third consecutive year of La Niña events contributed to **significant** rainfall and flood events across Victoria in spring 2022.



Most of Victoria's major water storages are close to full, with regional storages at a combined total of just over 97%.



Melbourne's water supply is in its best position in more than a quarter of a **century** – with three consecutive years of above average rainfall – combined

with use of the desalination plant pushing our storages above 95%.



Throughout the flood emergency events in October and November 2022, water corporations prioritised the continuation of services and protection of infrastructure to ensure communities retained access to potable drinking water and wastewater services

Climate outlook



A La Niña event continues in the tropical pacific **but is beginning** to weaken.



The Bureau of Meteorology's (BoM) outlook is for **cooler temperatures** and close to average rainfall for the remainder of summer. Autumn is projected to be dry with temperatures warmer than usual and rainfall below average.

Regional urban



Urban water restrictions will not be required for any regional city or town this summer and autumn, due to full storages and wet conditions.





Total storage levels across regional Victoria's major water storages

are 11% higher than at the end of January 2022.

Restrictions are possible, but highly unlikely, for some towns in East **Gippsland and South Gippsland** before the end of 2023, if conditions turn unexpectedly dry.

Melbourne



Melbourne will not face water **restrictions** this summer and autumn and water storages are 7% higher than this time last year.



Melbourne's water supplies have **been boosted** by a third year of La Niña weather conditions.



While water supplies are secure in the short-term, we **need to continue to** closely manage supply and demand to adapt to a changing climate and significant future population growth.

In collaboration with the water industry, we have been working to ensure we have a range of water sources to boost supplies if needed over the longer term. This includes recycled water for non-drinking supply and desalinated water for drinking water supply.



While storages are currently high across most of the state, **storages can** drop rapidly during hot, dry periods. Using water wisely now reduces the chances of needing to implement water restrictions in the future.

Rural



All northern Victorian regulated systems have received a 100% seasonal determination for both high-reliability and lowreliability water shares. This is the first time this has occurred since water entitlements were established in their current form in 2007.



Rural water users in southern Victoria's regulated systems will have access to 100% of their highreliability entitlements.



All entitlement holders in the Wimmera-Glenelg system received 100% allocation against their entitlement for the first time since 2011–12.



Licence holders in most unregulated systems will have access to water in line with their licence conditions, with few streams on restrictions this summer and autumn.



Wetter conditions across winter and spring in 2022 have allowed groundwater levels to remain stable or increase. Most groundwater licence holders will not have their take restricted in 2023.

Traditional Owners



Traditional Owners have enduring cultural, spiritual, and economic connections to land, water and resources. With the new release of the Water is Life: Traditional Owner Access to Water Roadmap (2022), the Victorian Government is taking the first steps towards acknowledging past water injustices and putting a new focus on increasing the role of Traditional Owners in water management across Victoria.



Depending on climatic conditions in the coming months which affects availability in unregulated waterways, the Palawarra (Fitzroy River) system may face temporary restrictions on diversions in 2023. **Traditional Owners** holding water entitlement in the Mitchell River system can expect water supply without restrictions in the coming months to support the self-determined use of that water.

Environment



Healthy rivers and wetlands make cities and towns more liveable and contribute to the physical and mental wellbeing of people.



Catchments in the state's east, central and northern regions are expected to have high reserves of water for the environment in 2023. Environmental water reserves in western Victoria are expected to be moderate to high.



High rainfall in spring 2022 has caused widespread flooding in northern Victoria and high river flows in other parts of the State. These natural events have met, and in many cases significantly exceeded, planned environmental watering actions.



The wet conditions will trigger significant breeding by native fish, waterbirds and frogs and stimulate the growth of wetland plants and floodplain trees. If conditions become drier during the remainder of summer and into autumn, water held for the environment may be used to enhance the success of naturally triggered breeding events.

3. Climatic conditions



Temperature and rainfall influence water use. We use more water in summer when it is hotter and drier (for example for gardens and pools), than in winter when it is wetter and colder. Water corporations are continually monitoring storage conditions and use. They forecast demand using the BoM's seasonal climate outlooks, updated weekly.

Recent conditions

Winter 2022

- Rainfall was close to average across most of Victoria, with below average rainfall in the north-west Mallee and well above average rainfall in South Gippsland.
- Daytime temperatures were above average around Melbourne and west to Cape Otway, with nighttime temperatures warmer than average across much of the state, particularly in East Gippsland.

Spring 2022

- Victoria received its highest spring rainfall since records began in 1900.
- Maximum temperatures were below average, with most of the state's north experiencing temperatures very much below average.

Summer 2022-23

- Rainfall in December 2022 and January 2023 was below average for most of Victoria, particularly across large parts of the Wimmera and Mallee districts. Above average rainfall was received in parts of north-east Victoria and East Gippsland.
- Maximum temperatures in December 2022 and January 2023 varied across the state.
 Temperatures were below average in eastern
 Victoria but warmer in central and western areas.

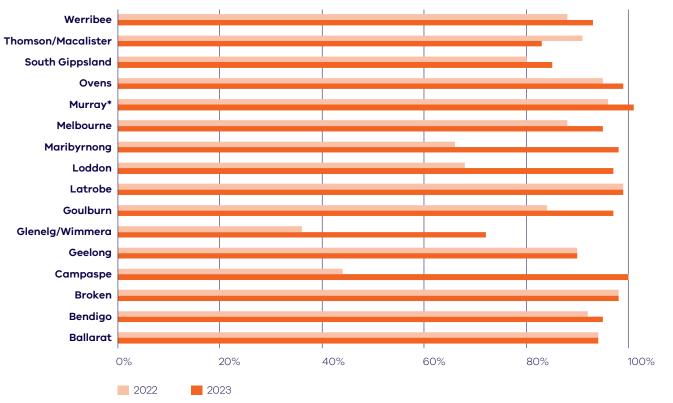
Current state of Victoria's water storages

Rainfall across Victoria has been above average over the past three years, leading to full storages across almost all of the state.

Figure 1 shows the state of Victorian storages as at 31 January 2023 compared to the same time last year.

	2023	2022	% change
Victoria's major storages	96.8%	86.3%	+10.5%
Melbourne storages	95.1%	88.3%	+6.8%
Victoria's regional storages	97.1%	86.0%	+11.1%

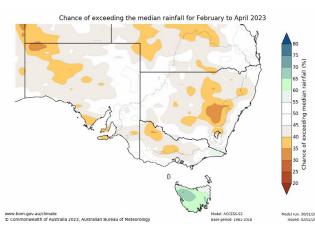




*The Victorian share of the Murray storages are updated monthly. Volumes for Murray storages are from 31 December.

February to April outlook

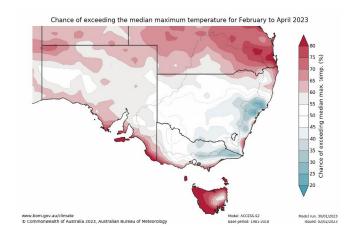
Figure 2. Chance of exceeding **median rainfall** for February to April 2023



Rainfall is likely to be below average for most of Victoria from February to April 2023

The BoM seasonal outlook indicates that large parts of the state are likely to receive below average rainfall from February to April (**Figure 2**). East Gippsland is most likely to exceed the median rainfall over this period (50-60%).

Victoria is likely to receive close to average rainfall in February, however Autumn rainfall is expected to be below average across the state.. **Figure 3.** Chance of exceeding median maximum temperature for February to April 2023



Temperatures will vary significantly across Victoria between February and April 2023

The BoM seasonal outlook for February to April 2023 indicates that **average maximum temperatures** are likely to be below average in northern and eastern parts of the state (**Figure 3**). However, median maximum temperatures are likely to be exceeded along much of the southern coast (60-80%).

Victorian climate and streamflow over coming decades and the longer-term future



Victoria's climate and streamflow is highly variable, but within this variability we have experienced a warming and drying trend over recent decades.

In comparison to historical conditions, we are already experiencing trends toward:

- Higher temperatures and more hot days;
- Reductions in rainfall during the cooler months;
- In some locations, increases in rainfall during the warmer months and during extreme, short-duration rainfall events; and,
- In many catchments, a shift in the streamflow response to rainfall, with typically less streamflow generated for a given amount of rain.

Some of the rainfall decline in the cooler months can be attributed to increases in greenhouse gas concentrations in the atmosphere. During the cooler months we have been getting less rainfall from low pressure systems and frontal systems, and in the northern part of Victoria more rainfall during the warmer months from thunderstorms. The cause of the reduction in streamflow response to a given rainfall is not yet fully known and is the subject of continuing research.

In the future, over the longer term we can expect:

- the rainfall reductions in winter to persist;
- possible increases in summer rainfall and extreme rainfall events;
- increases in potential evapotranspiration due to higher temperature and lower relative humidity;
- reductions in streamflow because of less rainfall and higher potential evapotranspiration; and
- the streamflow response to rainfall to no longer remain the same, and to generally decline.

Even if there is an increase in summer rainfall, it is unlikely to offset the streamflow impact from rainfall reductions in winter because most of the runoff in Victorian catchments occurs over winter and spring. In the warmer months, catchments are drier and more rainfall soaks into the ground, is used by vegetation or evaporates.

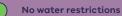


Victoria's climate will continue to be variable with wet years and dry years, against a background drying trend. With a warmer future and projections of declining water availability, we can expect more frequent and severe droughts in coming decades.

The Victorian Government is investing in further research to better understand how Victoria's climate is changing and the water resource implications, through the **Victorian Water and Climate Initiative**. More information on the observed changes and longer-term future climate and water projections can be found at: https://www.water.vic.gov.au/climatechange/research/vicwaci.

4. Urban water

Key messages



Water restrictions possible under a dry scenario

Water restrictions only possible under a worst on record scenario

CLIMATE SCENARIOS EXPLAINED

The climate scenarios considered for the annual water outlooks are plausible and possible representations of climate conditions over the outlook period.



Average: based on average climate experienced since 1975



Dry: based on the driest tenth per centile (10%) of climate experienced since 1975

Worst: similar to the extremely dry conditions experienced during the peak of the Millennium Drought in 2006-07.

* Annual Water Outlook published in January



Click on the location pins for more information.

Most water corporations prepared their annual water outlook for 1 December 2022 in line with previous years. Some water corporations delayed publishing their annual water outlook until January 2023 to re-direct their resources to the flood emergency response in October and November 2022.

The interactive map on this page illustrates the water restrictions expected across the state under a range of climate scenarios. The restriction projections shown were based on the latest information available to water corporations in November 2022 in time for publishing on 1 December 2022, except where otherwise denoted. These projections are mostly for the 12-month period from 1 December 2022 to November 30 2023, except for some smaller **run of the river systems**.

Urban water supplies, the year ahead

Individual urban water corporations assess water supplies on a system-by-system basis, to determine the best ways to manage supply and demand to ensure secure supply for cities and towns. Implementation of water restrictions is only one of a range of possible responses that water corporations may use to help cope with potential water shortages. Specific to each system, other responses may include behaviour change campaigns, use of standby water sources, water carting and water trading.

For the 12-month outlook period from December 2022-November 2023:



Under predicted wet and average conditions, no water restrictions are expected.



Under a dry climate scenario¹, **water** restrictions are possible for 16 towns in:

- Mitchell, Swifts Creek and Buchan systems in East Gippsland, and
- Fish Creek in South Gippsland.



Under a worst on record climate scenario², water restrictions are possible for 45 towns.

Table 1 contains details for these towns, their outlook for summer and autumn and the short-term measures. available to help affected communities and improve supply security.

Water systems across the state are diverse and many factors influence why some are more vulnerable to drought than others. Factors include:

- Climatic conditions.
- Physical characteristics of water systems themselves, including reservoir capacity and availability of water for irrigation,
- Whether there is a drought reserve,
- Flexibility of local demand, including pressure by large industrial or commercial water customers.
- Whether there is the option for additional or alternative supplies.

Some parts of the state may be reliant on smaller water systems with smaller storages that either have less than 12 months' supply or a supply direct from a river or stream. These parts of the state are more susceptible to drought and dry conditions.

Based on the driest tenth per centile (ten per cent) of climate experienced since 1975.

2 A worst on record scenario would happen if conditions are similar to the extremely dry conditions that occurred during the peak of the Millennium Drought in 2006-07. This scenario is not expected in the Outlook period of 2022-23.

Table 1. Victorian towns that may have water restrictions applied in the outlook period

Water	System	Towns supplied	Climate scenarios			Mitigation actions	
Corporation			Expected (Wet/ Average)	Dry	Worst on record		
Barwon Water	Apollo Bay	Apollo Bay, Skenes Creek, Marengo				A worst on record scenario could see Stage 2 restrictions applied.	
	Lorne	Lorne				If climate conditions worse than recorded eventuate, other measures could include stage 3 and 4 water restrictions and water carting.	
Central Highlands Water	Amphitheatre	Amphitheatre				Central Highlands Water has a supplementary groundwater supply and has carted water in the past. An action from their Urban Water Strategy to connect Daylesford to the Goldfields superpipe is in developmen	
	Blackwood	Blackwood					
	Daylesford	Daylesford, Hepburn, Hepburn Springs					
East Gippsland Water	Mitchell	Bairnsdale (including Wy Yung and Lucknow), Lindenow, Paynesville, Raymond Island, Metung, Tambo Bluff, Lakes Entrance (including Lake Tyers, Lake Tyers Beach and Kalimna), Nowa Nowa, Nicholson, Johnsonville, Swan Reach, Bruthen and Sarsfield				Water from the Mitchell River is currently being injected into five groundwater bores in the Woodglen area as an additional raw water storage. A fourth groundwater bore has been commissioned to improve water security in the Mallacoota system.	
	Omeo	Omeo				In the unlikely event of an extreme short term water shortage carting is an option for the Buchan, Swifts Cre and Cann River systems.	
	Mallacoota	Mallacoota					
	Swifts Creek	Swifts Creek					
	Buchan	Buchan					
	Cann River	Cann River					

Water	System	Towns supplied	Climate scenarios			Mitigation actions
Corporation			Expected (Wet/ Average)	Dry	Worst on record	
Gippsland Water	Briagolong	Briagolong				A deeper groundwater resource is being investigated for Briagolong.
	Erica Rawson	Erica, Rawson				Water can be carted into Seaspray if required.
	Mirboo North	Mirboo North				
	Seaspray	Seapray				
North East Water	Myrtleford	Myrtleford				A worst on record scenario could see Stage 1 restrictions applied.
	Corryong	Corryong, Cudgewa				
South Gippsland Water	Ruby Creek	Leongatha, Koonwarra				South Gippsland Water has a supplementary groundwater supply, and is further developing options to enhance water security.
	Fish Creek	Fish Creek				
	Agnes River	Toora, Welshpool, Port Welshpool, Port Franklin, Barry Breach				

Securing our urban water supplies

To manage the impact of population growth and climate change, we need to stay focused on both water supply and demand.

Urban water security planning

Each urban water corporation produces an Urban Water Strategy every five years. These strategies forecast supply and demand for cities and towns, and where a potential future supply risk is identified, they identify the best mix of measures to maintain water security. These strategies include Drought Preparedness Plans that set out how the water corporation will respond to water shortages if they arise.

All regional urban water corporations released one of these strategies publicly in 2022. The strategy for Greater Melbourne system (involving Melbourne Water, Yarra Valley Water, South East Water and Greater Western Water), is yet to be noted by the Minister for Water. The next urban water strategies are due in 2029.

As part of those strategies, water corporations continue to engage with councils and other public open space managers to identify and assess which important liveability assets would be impacted under water restrictions and the extent to which they should be exempt from these restrictions. These include sporting facilities, public gardens, and street trees. Urban water corporations also consult with customers regarding important community assets that might require water to be made available during water shortages. For more information on Urban Water Strategies:

- Barwon Water
- Central Highlands Water
- Coliban Water
- East Gippsland Water
- Gippsland Water
- Goulburn Valley Water
- Grampians Wimmera Mallee Water
- Lower Murray Water
- North East Water
- South Gippsland Water
- Wannon Water
- Westernport Water
- Greater Melbourne (draft)

The Victorian Water Grid

Victoria's water grid works much like the state's road network by connecting water sources to urban, rural, environmental, recreational and cultural use, via an infrastructure network, and natural elements like rivers. The water grid includes the following elements:

- Capture, production and storage infrastructure (including dams, reservoirs, weirs, irrigation districts, groundwater extraction locations and the Victorian Desalination Project)
- Delivery infrastructure (including channels, pipes, pumps and the natural waterways used to deliver water)
- Arrangements by which water can be purchased and sold through the water markets, and allocated through the water entitlement framework.

When each urban water corporation does their Urban Water Strategy, they identify whether additional supply is needed, including whether augmentation to the water grid is required. The Victorian Government supports investment in the water grid to maintain water security for cities and towns.

The recent Central and Gippsland Region Sustainable Water Strategy (2022) outlines a new proactive readiness approach to water grid augmentation planning, so that new regionally significant supplies are available in time. We need to complete early option assessment and development well in advance of the infrastructure being needed, rather than waiting for a drought or an emergency. A continuous program of planning, readiness and acting before a crisis arises means that future key water supply decisions occur based on the best value options rather than those that can deliver water within the most compressed timeframe. This can help avoid sudden increases in water bills and ensure the community are involved in decisions on supply options.

Regionally significant projects will be identified, planned, and tracked through a Water Grid Plan framework. Options will be progressed according to clearly defined triggers for the different stages of planning and implementation. Option evaluation will involve the use of quadruple-bottom-line assessments to ensure economic, environmental, social and cultural costs, benefits and opportunities are considered.

Regionally significant options progressed through the Water Grid Plan framework will have clear governance arrangements in place. This includes establishing a new Executive Advisory Committee that will make recommendations to government at key decision points.

Desalination Project

The Victorian Desalination Project is an integral part of our drinking water supplies for Melbourne and surrounding regions. The water grid connects the desalination plant to many regional towns, including Geelong, Sunbury, Melton, Cowes, Wonthaggi, Korumburra, Poowong, Loch and Nyora.

In an average year, demand already outstrips supply from our rainfall-dependent water sources for the Greater Melbourne area. Melburnians currently use 50 to 70 GL more water per year than what flows into our storages in an average year, and the desalination plant has supplied 455 GL (25% of storage capacity) since being turned on in 2016 -17. Amid a changing climate which will lead to a future of volatile weather, hotter temperatures and more severe drought, the Government is preparing now so Victoria's communities, farmers, industry and tourism can have confidence in the state's future water supply.

On 21 September 2022, delivery of desalinated water was stopped following a request– based on advice from Melbourne Water – to cancel the rest of the 2022–23 water order. This followed the unexpected high inflows experienced during August, on top of the high levels in Melbourne's water storages. Approximately 4 gigalitres of this year's 15 gigalitre order was delivered before the order was cancelled.

In a severe drought, storage levels can drop by 20% in as little as a year – which is why management of water supply must be responsibly managed to avoid challenging water restrictions like those in place during the Millennium Drought. How you can help to secure our water supplies

DID YOU KNOW



Permanent Water Saving Rules are always in place throughout the state to ensure we use water wisely, even when water restrictions do not apply.

The urban water corporations are working collaboratively with DEECA on a program of initiatives for residential and non-residential customers, including the:

- Target 150 water efficiency program helping metropolitan Melbournians to target 150 litres of water per person per day - https://www.water.vic. gov.au/liveable/using-water-wisely/t150
- Target Your Water Use regional water efficiency program focusing on efficient water use for each region - https://www.water.vic.gov.au/liveable/ using-water-wisely/target-your-water-use
- Schools Water Efficiency Program enabling schools to track their water usage using data loggers to help identify leaks, faulty appliances and inefficient water practices. It also provides education material for helping students learn about water efficiency - https://www.water.vic. gov.au/liveable/water-education

- VicFacilities, using a similar approach to the Schools Water Efficiency Program, is helping state government sites and councils save water and reduce water and wastewater charges by tracking water use and identifying leaks.
- Community Rebate and Housing Retrofit
 programs helping vulnerable and hardship
 customers and not-for-profit housing
 organisations to reduce water use and bills.
 https://www.water.vic.gov.au/liveable/using water-wisely/community-support.
- Smart Water Advice providing water utilities, customers and councils with a range of educational, interactive water saving resources
 www.smartwatermark.org/Victoria

DEECA is also working with the urban water corporations to design and implement a range of new water efficiency initiatives, ranging from water use and efficiency audits for sporting grounds to a targeted non-residential water efficiency program. See Chapter 2 of the *Central and Gippsland Region Sustainable Water Strategy* (2022) for more information https://www.water.vic.gov.au/sws.



5. Traditional Owners



Traditional Owners have enduring cultural, spiritual, and economic connections to land, water and resources. They have managed land and water sustainably over thousands of generations on Country, and these connections deserve respect and recognition. The release of *Water is Life: Traditional Owner Access to Water Roadmap* in September 2022 sets out the opportunities for Traditional Owners to access and manage water for spiritual, cultural and environmental purposes. It is also a framework to create and maintain a careful and considered balance between the rights and entitlements of everyone involved. Victoria has so far returned 5.86 gigalitres of water to Traditional Owners across the state - supporting the self-determination of Traditional Owners by providing opportunities to manage water in ways that best meet their needs.

PALAWARRA (FITZROY RIVER) ALLOCATION

Gunditj Mirring Traditional Owners Aboriginal Corporation (GMTOAC) received 2.5 gigalitres of unallocated water in the Palawarra (Fitzroy River) system in Southwest Victoria in March 2022. GMTOAC plan to use the water in the UNCESO World Heritage Listed Budj Bim Cultural Landscape that was recognised in 2019 for its cultural values to the Gunditjmara community. Maintaining the flow of water over Country is an essential aspect for managing the cultural values of Budj Bim, which contains the world's most extensive and oldest aquacultural system. A complex system of channels, weirs and dams were developed by Gunditjmara to trap, store and harvest kooyang (short-finned eel).

MITCHELL RIVER ALLOCATION

Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) received 2 gigalitres of unallocated water in the Mitchell River. GLaWAC have provided the statement below:

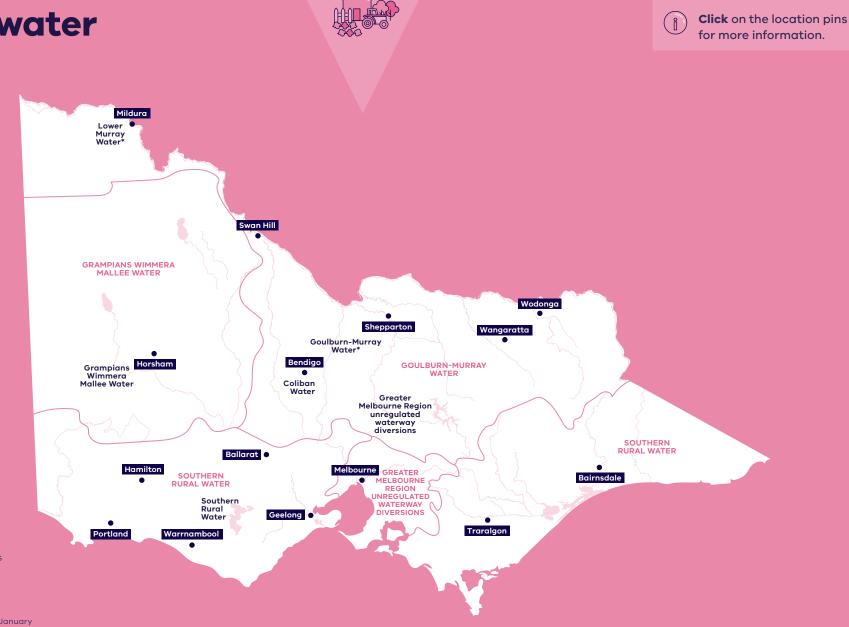
"GLaWAC has been yarning with Gunaikurnai members about what they want to do with the two gigalitres of Mitchell River water, handed back to mob in 2020. Water justice is a priority for Gunaikurnai people, who recognise that the allocation is a solid step forward but very much the beginning of the journey. The message is clear, Traditional Owners don't want to justify why they want cultural water. Members have been encouraged by the Minister's recent recognition that their water rights were never ceded, and her commitment to act quickly to restore rights as further progress towards self-determination. With cultural water aspirations across their RAP essential for healthy Country and healthy mob, GLaWAC is keen to work with DELWP to realise the promise and urgency created within Water is Life."

> Credit: Gunaikurnai Land and Waters Aboriginal Corporation

Rural water

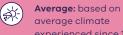


Key messages



CLIMATE SCENARIOS EXPLAINED

The climate scenarios considered for the annual water outlooks are plausible and possible representations of climate conditions over the outlook period.



average climate experienced since 1975 Dry: based on the

driest tenth per

centile (10%) of climate



experienced since 1975 (\mathbf{I})

Worst: similar to the extremely dry conditions experienced during the peak of the Millennium Drought in 2006-07.

* Annual Water Outlook published in January

Rural water supplies, the year ahead



Northern Victoria

Regulated systems

All regulated systems have received seasonal determinations of 100% HRWS and 100% LRWS for 2022-23, the first times since **unbundling** in 2007.

The **reserves** established in 2021-22 supported the high level of water availability in northern Victoria early into the 2022-23 season. Significant rainfall across the north of the state from July to November 2022 led to much higher than average inflows to storages and supported seasonal determinations of 100% HRWS and 100% LRWS to all systems by 15 December. These significant rainfall events contributed to widespread flooding across northern Victoria in October. It also caused all water carried over from the previous season (2021-22) and held in spillable water accounts to be written off.

There are sufficient reserves for the 2023-24 season to support seasonal determinations of 100% HRWS in the Murray and Goulburn systems by April 2024 as long as inflow volumes expected in 99 out of 100 years are received before then. Campaspe and Loddon systems are also expected to receive 100% HRWS in 2023-24.

As annual systems the Broken, Bullarook and Ovens system and water availability in 2023-24 will depend on seasonal conditions and inflows closer to the start of 2023-24.

Unregulated rivers, streams and creeks

Water users that access water from unregulated rivers, streams and creeks only have access to licenced water when streamflows reach the minimum flow requirements specified in management plans. In northern Victoria, these are managed and monitored by GMW.

Following above average rain in winter and spring, restrictions for unregulated waterways were lifted for all unregulated waterways except for Wanalta Creek which has had restrictions since 2016. Over the course of January, several more streams experienced restrictions on diversions.

The most likely water quality risk to occur this year and next are blue-green algae and hypoxic blackwater. While these events are unlikely to impact customer supplies, they would impact aquatic life and recreational uses.

Groundwater

Groundwater recovery and drawdown levels in northern Victoria are dependent on rainfall recharge and groundwater extraction. Groundwater aquifers across northern Victoria showed strong recovery throughout 2021-22 with below average use and above average rainfall. A wet spring and moderate conditions in December and January have helped reduce demand and will support groundwater levels remaining stable or improving in 2023.

Most groundwater licence holders have access to 100% of their entitlement with the exception of customers in the Lower Campaspe Water Supply Protection Area (WSPA) and the Katunga WSPA.

WATER SHARES EXPLAINED

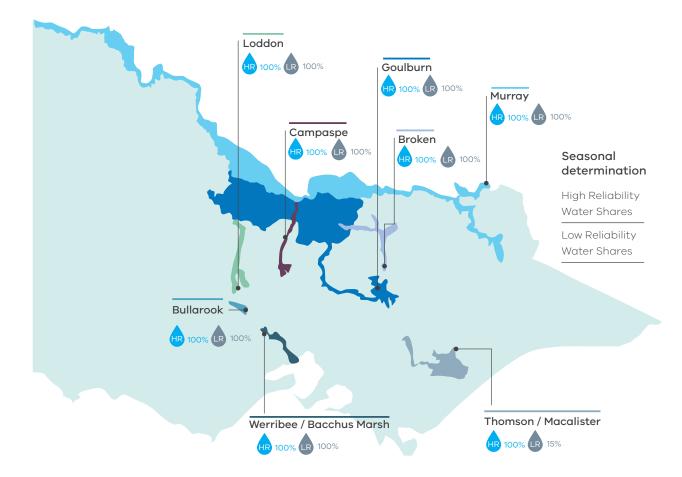
A water share is an ongoing entitlement to a share of water available in a water system. The volume of a water share is defined as the maximum amount of allocation that can be made against it each year.

Water shares are classed by their reliability, which is defined by how often full season allocations are expected to be available. In Victoria there are two types, **high-reliability** water shares (HRWS) and low-reliability water share (LRWS).

Allocations are made to HRWS before LRWS. When HRWS have reached 100 per cent allocation and existing commitments are satisfied, only then will allocation for LRWS be considered.

Rural water

Figure 4. Seasonal determinations in Victorian declared systems as at 7 February 2023



- Water year 1 July to 30 June
 Water shares can be high or log
 - Water shares can be high or low-reliability. Seasonal determinations are made to high-reliability water shares before low-reliability shares.

Lower Murray Delivery risks

LOWER MURRAY DELIVERY RISKS

There is always a possibility that flows in the River Murray System downstream of Barmah are insufficient to meet demands for water entitled to be used where and when it is needed.

This can occur either when the physical channel capacity of the river limits the amount of water that can be delivered (a system shortfall), or when demand spikes and there is not enough time to release more water from dams (a delivery shortfall). The Murray-Darling Basin Authority (MDBA) operates the river on behalf of the River Murray states (Victoria, New South Wales and South Australia) and actively manages the system to avoid shortfalls. However, significant changes over the past 10-20 years in both supply and demand are making it increasingly difficult to avoid shortfalls, and there can always be unforeseen circumstances that may arise. If required, the MDBA will announce a shortfall in the lower Murray, and states will ration demand between water users in the affected reach.

The risk of a delivery shortfall exists every year and is more likely during an extended heatwave. This is because it takes about three weeks for water released from Hume Dam to get to Mildura, so releases are made well before a heatwave is forecast or water users decide to increase their take. River operators have a good understanding about typical water use in the Murray, and draw on mid-river storages and weir pools where they can to meet spikes in demand and mitigate delivery shortfalls. When there is spare capacity in Lake Victoria, river operators can also accommodate demand spikes by releasing surplus water from Hume and capturing it in Lake Victoria.

The risk of a Murray shortfall is monitored by the MDBA throughout the year. The MDBA's *River Murray System Annual Operating Outlook for 2022-23* sets out how the system will be operated, including to avoid a shortfall, under a range of different inflow conditions.

The availability of water in Menindee Lakes helps meet demands in the River Murray and reduces the amount of water required to be released from Hume to meet River Murray. As advised by the MDBA in the 2022-23 outlook, this means the risk of a system shortfall this year is very low. This also reduces the amount of water required to be released from Hume to meet River Murray demands. This reduces the buffer against unanticipated spikes in demand upstream of Wentworth Weir and increases the risk of a delivery shortfall. The MDBA has advised the risk of delivery shortfalls this year is expected to be manageable; however, despite the wet year, the risk of delivery shortfall can never be managed to zero.

During summer and autumn, the MDBA report on emerging system and delivery shortfall risk in an updated *River Murray System Annual Operating Outlook* 2022-23, expected to be released in early 2023, and in its River Murray Weekly Report.



Wimmera-Mallee

Regulated systems

In contrast to recent years, rainfall across the Grampians reservoir catchment for the 2022-23 season so far has been significantly above average. Inflows to reservoirs in October and November were more than five times higher than the average over this period. Storages are now holding 398,740 ML of water equivalent to being 71.2% full, which is 34.6%, or about 193.8 GL, more than the same time last year (as at 8 February 2023).

On 6 January 2023, Grampians-Wimmera Mallee Water (as storage manager for the Wimmera-Mallee system) announced a full allocation to the Commonwealth Environmental entitlement – the first time this has ever happened. All entitlement holders in the Wimmera-Glenelg system have now received 100% allocation against their entitlement for the 2022-23 season.

Unregulated rivers, streams and creeks

Irrigation diversion triggers have been satisfied for both the Wimmera and Avoca Rivers, so water may be extracted for irrigation and commercial uses subject to licence conditions and local management rules.

Groundwater

There are sufficient volumes of groundwater available to meet demands, except for Neuarpurr Zone 1 which remains on restrictions as part of a long-term management plan.



South-western Victoria

Regulated systems

There are two irrigation districts in south-western Victoria – Werribee and Bacchus Marsh – both of which are supplied from the Werribee and Lerderderg catchments via the Werribee system. At the opening of the irrigation season, Pykes Creek Reservoir was at 86.8% of capacity and Melton Reservoir was at 87.3% of capacity. Since then, the catchments have continued to receive good rainfall, resulting in both Reservoirs filling and spilling while seasonal determinations reached 100% HRWS and 100% LRWS on 27 December. Water users carried over 10.4 GL of allocation equivalent to about 65% of the total entitlement.

At the beginning of the irrigation season Rosslynne Reservoir, in the neighbouring Maribyrnong catchment was at 63% capacity, compared to 41% at the same time the year before. This was due to above average rainfall in the previous 12 months and higher inflows from the Maribyrnong catchment. As at 8 February the reservoir is at 98% capacity compared to 66% at the same time last year.

Unregulated rivers, streams and creeks

Heavy late winter and early spring rainfall has occurred across western Victoria. Rainfall across the region has been above average for spring and has seen the major streams, and the Barwon, Leigh, Glenelg, Wannon and Hopkins rivers and Mount Emu Creek experiencing bank full and over bank flows through much of the rainfall season and well into spring. On farm storages filled and overflowed, and many aquifers will have been able to recharge. Saturated catchments will support baseflows through summer, and could allow for unregulated licence holders to divert water without restrictions. Diversion rosters and restrictions are unlikely for major river basins in the far south-west based on current flows and the forecast moderate conditions, however they are likely to continue in autumn for the Crawford, Merri and Fitzroy (Palawarra) rivers.

Groundwater

Groundwater levels in the western areas are generally showing a stable or increasing trend, which reflects the wet conditions. A 100% allocation was announced on 1 July 2022 for the shallow Deutgam aquifer in Werribee South. This is an improvement from the start of the 2020-21 and 2021–22 seasons, when licence holders were restricted to 50% of licence volume to protect the aquifer.



Gippsland

Conditions in Gippsland have been wet for the third consecutive season. Rainfall in Gippsland has been above average for spring, meaning that all eastern Victorian rivers are flowing at higher rates than twelve months ago and all farm dams are full. This has allowed high seasonal determinations for water shares and no unregulated licence holders on diversion rosters or restrictions during spring.

Regulated systems

The Thomson and Macalister irrigation districts are situated in central Gippsland, and the primary source of water is Lake Glenmaggie, supplemented by water held in a 'drought reserve' in the Thomson Reservoir which provides additional allocation in years with low rainfall. Good inflows through early winter allowed for an opening seasonal determination of 100% HRWS for Thomson and Macalister water shareholders for the 2022-23 season. Continuing high inflows into the catchment allowed SRW to announce the availability of spill entitlement on 5 September which continued through to 15 December. This means that water used from the beginning of the irrigation season is classified as spill entitlement and allocation against HRWS are reset to 100%. Seasonal determinations for lowreliability entitlements reached 15% on 7 February 2023. As at 8 February, Blue Rock Reservoir (in the Latrobe system) is 100% full. Under the forecast medium to high streamflows, Blue Rock Reservoir is likely to hold or slightly decline over summer and quickly refill with winter/autumn rains. Blue Rock Reservoir has filled in eight of the last ten years.

Unregulated rivers, streams and creeks

Given the wet conditions experienced over spring and into summer, it appears that only minor diversion restrictions may apply in some systems during late summer and early autumn.

The Mitchell River is the most significant of the systems in the east of the state. The Mitchell River is experiencing strong flows similar to recent years, resulting in a positive outlook for summer. Diversion restrictions may apply late in the season if dry conditions return but are otherwise unlikely.

South and central Gippsland rivers have been flowing well so far this irrigation season and, given the moderate outlook, diversion restrictions for licence holders on unregulated streams are unlikely to be required.

Groundwater

Groundwater systems throughout Gippsland do not have any restrictions on extractions by licence holders and are well placed to meet unrestricted demand.



South-Central Victoria

Unregulated rivers, streams and creeks

The Yarra Valley region experienced wetter than average conditions across most of 2022 with the winter period experiencing well above average rainfall conditions, which has meant that most unregulated systems have seen no diversion bans or restrictions. Based on the already average to above average rain conditions to date, licence holders are not expected to face extended periods of restrictions for the summer irrigation period. There may be small periods of restrictions if there is a dry end to summer. Areas reliant on dams for irrigation water, such as Yarra Glen and Dixons Creek, are in a good position with most off-stream dams full.

Winter and spring rainfall across the Dandenong Creek catchment has been high and is consistent with the wetter conditions observed last year. Stream flows in the Dandenong Creek systems have remained similar to last year. Above-average flows have been observed in Mile Creek, Monbulk Creek and Eumemmerring Creek systems. The forecast rainfall across the catchment makes diversion restrictions for licence holders unlikely.

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The Werribee and Maribyrnong catchments had above-average rainfall throughout 2022. The summer season is looking similar to summer 2021-22 where restrictions were not imposed on the Maribyrnong system. The Turitable Creek and Willimigongong Creek are usually subject to a total ban in the summer months though neither system had bans imposed in the past two years. With above-average rainfall predicted for the 2022-23 summer, these systems may avoid bans again this year, however conditions in these systems can change quickly.

Rainfall across the Tarago/Bunyip catchment remained above average during winter 2022. With wet conditions experienced at the start of summer, and above average rainfall forecast for the remainder of summer and into autumn, the river system should be well placed to meet consumptive demands through the coming irrigation season.

Securing our rural water supplies

Rural water infrastructure is vital to support agriculture and its future growth. Successive governments have invested in modernising irrigation districts with a focus on reducing the amount of water required to operate the irrigation systems and increase the value of agricultural production. Governments have also partnered with communities to build modern stock and domestic supply systems in drier parts of the state that traditionally rely on rainfall or groundwater.

The Victorian Government, the Commonwealth Government, water corporations and local communities have invested in a number of important water infrastructure projects that increase water security and improve drought resilience for our regional communities. Between 2020-2022, four of these projects have been completed. The most significant of these is the Connections Project, the largest irrigation modernisation project in Australian history, which has now completed works to achieve 433 GL of water savings to be shared between the environment, irrigators, the Melbourne water retailers and Traditional Owners. This world-leading delivery system will support the sustainable future of productive agriculture in the Goulburn-Murray Irrigation District (GMID) for generations to come.

The other three projects that reached practical completion includes the Mitiamo and District Reticulated Water Supply Project, Macalister Irrigation District Phase 1B project and Werribee and Bacchus Marsh Irrigation District Modernisation. These projects will improve water security, boost productivity, and provide significant regional community benefit. Currently, there are four major water infrastructure projects well underway. This includes the innovative \$116.3 million Western Irrigation Network (WIN) which is a major new recycled water irrigation scheme for the Parwan-Balliang agricultural district to the west of Melbourne.

Victoria successfully put forward projects for funding under the National Water Grid Fund to deliver projects that will improve the reliability and security of water for regional communities and agriculture and primary industry sectors. These projects include the \$11 million Bellarine Recycled Water for Agriculture Project which will provide high quality, fit-for-purpose recycled water for high value agriculture and horticulture on the Bellarine Peninsula, and the \$21 million Werribee Irrigation District Modernisation Stages 4 & 5 which will complete the replacement of a manual, dilapidated, and inefficient channel-based irrigation network with a modern, automated pipeline across the Werribee Irrigation District. An additional six business case projects have been funded across the State.

In addition, Victoria secured \$20 million of National Water Grid Funding to deliver nine small-scale construction projects across Victoria to contribute to delivering secure, affordable and reliable water. Collectively, these projects are expected to deliver up to 100 jobs during construction and secure over 125 ongoing jobs, provide 900 megalitres in additional water storage capacity, 1700 megalitres per annum increased water availability and an increase of an estimated 664 hectares of additional irrigable land. Under the Off-Farm Efficiency Program, Victoria has secured \$37.9 million from the Commonwealth Government to support the delivery of the Lower Murray Water (LMW) Water Efficiency Project. The project will modernise and upgrade existing irrigation infrastructure and improve metering to provide a more secure and efficient rural water delivery network for the Sunraysia region. The project is expected to recover an estimated 2.5 GL of water from system losses such as leaks and evaporation by upgrading over 27km of irrigation supply channels and replacing or decommissioning around 700 stock, domestic and dethridge meters, providing a more secure water supply to nearly 5,000 irrigators in the LMW irrigation district and supporting an estimated 110 local construction and project delivery jobs.

An additional project being delivered under the Commonwealth Off-Farm Efficiency Program is the \$177.5 million Goulburn Murray Water (GMW) Water Efficiency Project, which secured Commonwealth funding in March 2021. This project is modernising and rationalising over 250km of the irrigation supply system in targeted locations across the Goulburn Murray Irrigation District. The project is underway and has so far completed works to achieve 9 GL of water savings (as at September 2022), and is on track to recover a total of 15.9 GL of water savings from works by 2024.

The feasibility of developing irrigated agriculture in central Gippsland was explored through a SRW-led Southern Victoria Irrigation Development Feasibility Study, with its **findings now available on SRW's website**. The findings of this study have informed the development of the Central and Gippsland Region Sustainable Water Strategy.

Click on the location pins for more information.

7. Environmental water

Key messages



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Environmental water supplies, the year ahead

WHAT IS WATER FOR THE ENVIRONMENT?



'Water for the environment' is water managed to protect and maintain rivers, wetlands and lakes, and the native species that rely on them. It is critical in keeping waterways – and the life within and around them – healthy. Environmental flows also support activities like recreation, tourism, timber production and beekeeping, and help maintain cultural connections and values as well as social wellbeing.

The Victorian Environmental Water Holder (**VEWH**) holds water entitlements and receives water allocations that can be used for environmental purposes. The VEWH and its partner waterway managers consider a range of possible climate and water availability scenarios to determine environmental watering actions under different conditions. The VEWH's annual seasonal watering plan identifies the scope of the environmental watering activities that could occur in waterways across Victoria under different climate scenarios. The plan can be accessed at **www.yewh.vic.gov.au**. In northern Victoria, the VEWH works with the Commonwealth Environmental Water Office, the Murray Darling Basin Authority as well as New South Wales and South Australian governments to prioritise how and where water is used, and to ensure use of water is coordinated to optimise the condition of connected waterways in the southern Murray-Darling Basin.

Climatic conditions and water availability in the Gippsland, central and northern regions of Victoria have mostly exceeded the long-term average during the first half of 2022-23. Many major storages in the northern, central and Gippsland regions - including Thomson Reservoir for the first time in 26 years - have filled and spilled and there has been significant flooding in the Murray, Ovens, Goulburn, Campaspe and Loddon rivers. In the western region, the Wimmera and Glenelg rivers have received some good natural flows, which have caused moderate to major flooding in the Wimmera River and filled many storages in the Grampians after several years of dry conditions, boosting supply for water users, including water for the environment.

ENVIRONMENTAL WATERING ACTIONS SO FAR IN 2022-23

Environmental watering actions delivered so far this year have aligned with catchment conditions, primarily aiming to build on environmental gains from consecutive years of average-wet conditions and help river and wetland ecosystems recover from prolonged dry conditions during 2018 to early 2020. Water for the environment was delivered to Hattah Lakes and Gunbower Forest floodplain in the northern region during winter and early spring 2022, but deliveries ceased prior to extensive natural flooding in spring. Many deliveries across the state were paused or not required due to high natural high flows, spills and/or flood mitigation releases in spring. Above average rainfall limited the demand for environmental water in western Victoria in winter and spring 2022 and allocations reached 100% during late 2022. Watering actions in the Wimmera and Glenelg rivers will primarily aim to supplement natural flows to maintain habitats for native fish, platypus, and aquatic plants during summer and autumn. Larger and/or longer deliveries may be possible as a result of full allocations.

A third consecutive La Niña event was declared in spring 2022, and may still influence conditions over summer 2022 and autumn 2023.

If wet conditions continue, they are likely to cause ongoing high flows or floods in some rivers and might further fill some floodplain wetlands. These natural events support important ecological processes and are critical to the health and persistence of many native plants and animals that live in Victoria's waterways. Environmental water may be used to supplement natural high flow events (e.g. to extend the duration of a wetland inundation to help nesting waterbirds successfully raise their chicks) or may be saved for later use if not needed at the time. Subject to entitlement conditions, unused environmental water can be carried over to support environmental flows in subsequent years. The ability to carry water over between years is critical to help maintain waterway health in drier periods.

DOES THE VEWH BUY OR SELL WATER?

The VEWH may consider buying or selling water for the environment where it is important for meeting an environmental objective. The VEWH's annual *Water Allocation Trading Strategy* describes the trading activity that the VEWH may undertake during 2022-23: www.vewh.vic.gov. au/watering-program/trading.

8. Further information

More information about sustainable water management and how we manage in dry conditions can be found at:

Department of Energy, Environment and Climate
 Action – www.water.vic.gov.au

More information about your local conditions and how water corporations manage in dry conditions can be found at:

- Barwon Water www.barwonwater.vic.gov.au
- Central Highlands Water **www.chw.net.au**
- Coliban Water www.coliban.com.au
- East Gippsland Water www.egwater.vic.gov.au
- Gippsland Water www.gippswater.com.au
- Goulburn-Murray Water www.g-mwater.com.au
- Goulburn Valley Water www.gvwater.vic.gov.au
- Grampian Wimmera Mallee Water –
 www.gwmwater.org.au
- Greater Western Water www.gww.com.au
- Lower Murray Water **www.lmw.vic.gov.au**
- Melbourne Water www.melbournewater.com.au
- North East Water www.newater.com.au

- South East Water www.southeastwater.com.au
- South Gippsland Water www.sgwater.com.au
- Southern Rural Water www.srw.com.au
- Wannon Water www.wannonwater.com.au
- Westernport Water –
 www.westernportwater.com.au
- Yarra Valley Water www.yvw.com.au

More information about environmental water can be found at:

• Victorian Environmental Water Holder – www.vewh.vic.gov.au

More information about forecast rainfall and temperatures can be found at:

Australian Bureau of Meteorology –
 www.bom.gov.au/climate/ahead

More information about using water efficiently can be found at:

 Smart Water Advice www.smartwatermark.org/Victoria/

More information on water restrictions can be found at:

 https://www.water.vic.gov.au/liveable/usingwater-wisely/advice-and-rules

DID YOU KNOW



You can save up to \$100 a year on water and energy bills by switching from a 3-star to a 4-star showerhead.

water.vic.gov.au