Urban Water Strategy

East Gippsland Water

March 2022

Front Page Photo: Aerial view of Woodglen off-stream storages and Water Treatment Plant, north-west of Bairnsdale, East Gippsland Water

Acknowledgement

We proudly acknowledge the contribution and pay our respects to Gunaikurnai, Bidwell and Ngarigo Monero people as the Traditional Custodians of East Gippsland. We extend this to Elders both past and present, who have made a considerable contribution and effort towards the development of the East Gippsland Urban Water Strategy.

We recognise and respect their unique cultural heritage, beliefs, and intrinsic connection to Country, which continue to be important to them today. We have a strong commitment to further developing our relationships and partnerships with Aboriginal and Torres Strait Islander peoples, communities, and organisations.

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Acronyms

COVID-19	Coronavirus
DELWP	Department of Environment, Land, Water and Planning
DPP	Drought Preparedness Plan
DRP	Drought Response Plan
EGCMA	East Gippsland Catchment Management Authority
EGW	East Gippsland Water
GL	Gigalitres
GLaWAC	Gunaikurnai Land and Waters Aboriginal Corporation
kL	Kilolitre
IWM	Integrated Water Management
ML	Megalitre
NECMA	North East Catchment Management Authority
PS2023	2023-28 Price Submission
RAP	Registered Aboriginal Party
UV	Ultraviolet
UWS	Urban Water Strategy
WWTP	Wastewater Treatment Plant
WTP	Water Treatment Plant

1. Urban Water Strategy in brief

The East Gippsland region has been experiencing some of its most challenging years on record. Three years of debilitating drought led to the 2019 Black Summer bushfires which devastated our region. Shortly after, the impacts of the COVID-19 pandemic were emerging; hampering recovery efforts and leading to an increase in people moving to this beautiful part of Victoria.

These conditions present many challenges when it comes to long-term water planning. The team here at East Gippsland Water (EGW) have worked closely with industry experts to forecast long term growth rates, develop stream flow projections based on robust climate change scenarios, and engage with our communities during such a fatiguing period.

Because of this, our journey with this Urban Water Strategy commenced in early 2019 when we noticed that summer stream flow in the Mitchell River, (which supplies 85 per cent of our customers) was tracking well below what was forecast in our 2017 Urban Water Strategy.

The Mitchell River has been such a reliable source of water supply for our region that historically, we have only ever required approximately three months of storage as a buffer during summer low flow periods. After revising our climate change scenarios based on the more recent trends, it became evident that we have an immediate deficit based on levels of services agreed with our customers.

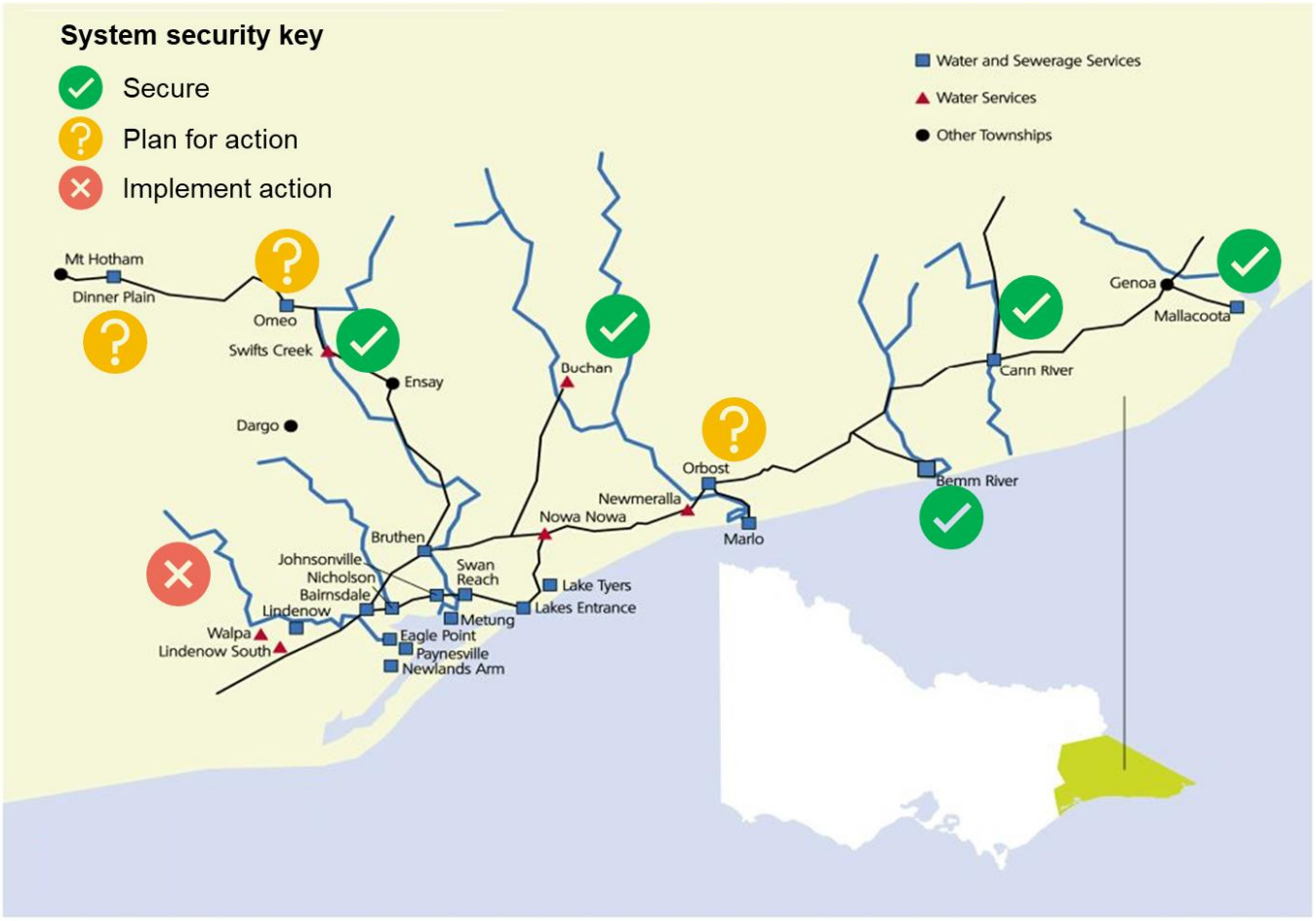
Extensive work has been done to assess options to address this deficit, with significant engagement undertaken with our community, Customer Committee, and Board. Ultimately, the decision has been made to progress with a third off-stream storage at our Woodglen Water Treatment Plant site, scheduled for construction early in our 2023-28 pricing period.

Our Customer Committee, while supporting the progression of a third storage, have also made recommendations around improved community education programs, water efficiency and integrated water management (IWM) opportunities that we have committed to actively progressing during our 2023-28 pricing period. The opportunities identified by the Customer Committee align well with the direction of Water for Victoria and the draft Central and Gippsland Sustainable Water Strategy. We would like to thank our Customer Committee for their commitment and wisdom throughout our engagement on this Urban Water Strategy.

Through this Urban Water Strategy process, we have built partnership connections with the Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC). Following the release of this strategy, we will continue to progress partnership and project opportunities with GLaWAC. We wish to thank GLaWAC for their contribution to this Urban Water Strategy and for taking the time to engage with us on these opportunities.

While the Mitchell River System has proven to be our biggest challenge in this Urban Water Strategy, we have assessed our eight other systems in detail using more extreme climate scenarios. This included developing a full SOURCE model for our Orbost water supply system for the first time. This information will become invaluable in future as we develop our longer-term strategy for our systems. While no major augmentations are identified for supply system other than the Mitchell, significant planning will need to occur in the next five years to ensure water security into the future for customers across our region.

A summary of the security of supply of our systems is shown below,



2. East Gippsland Water overview

EGW operates nine separate drinking water supply systems. The systems are a combination of:

- Surface water (rivers, streams, and creeks) supplying off-stream storages (Bemm River, Buchan, Cann River, Orbost, Omeo, and Swifts Creek supply systems);
- Mixture of surface water and groundwater supplying off-stream storages (Mitchell and Mallacoota systems); and
- Groundwater supplied to storage (Dinner Plain).

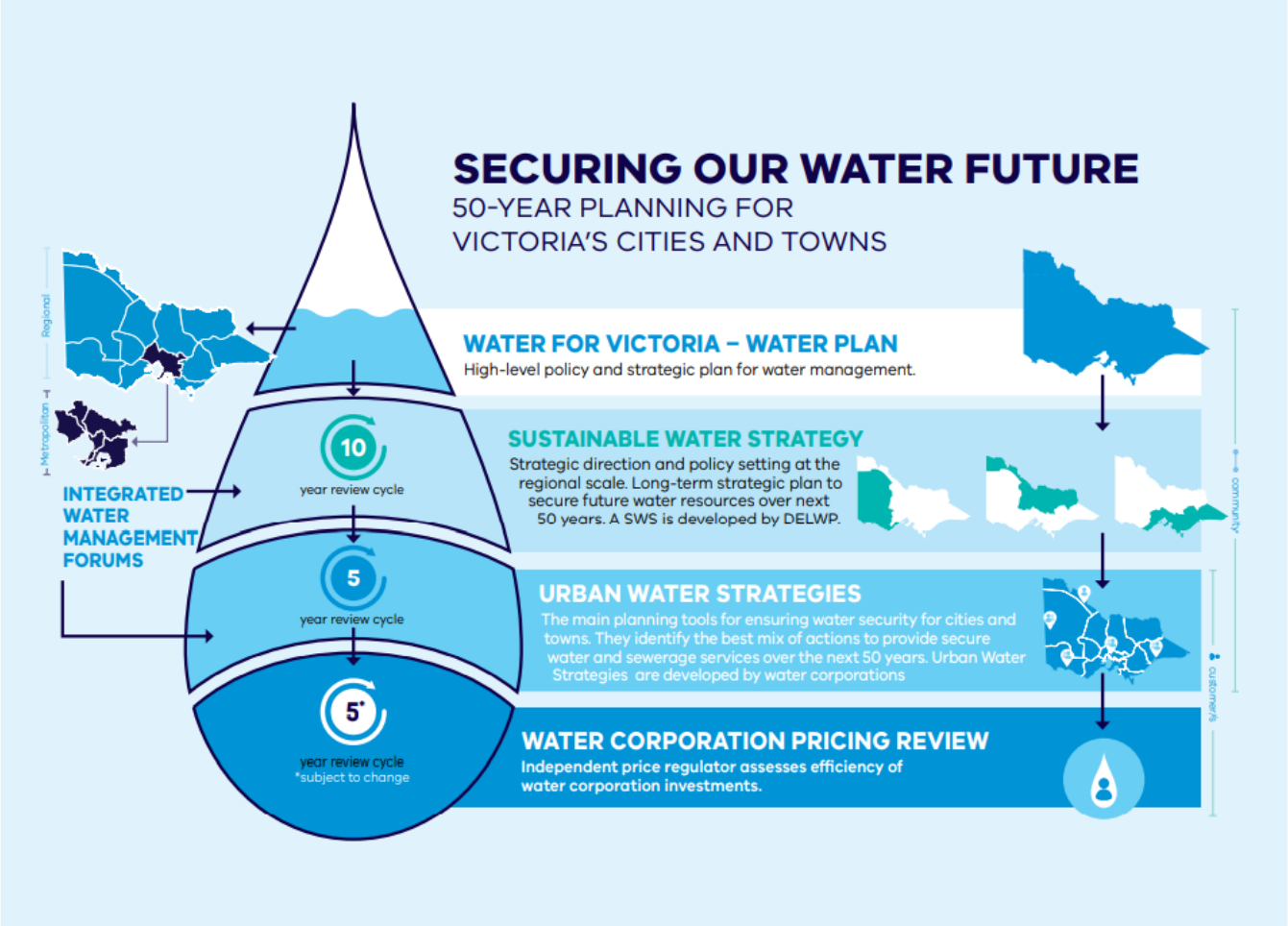
The townships provided with water services are shown in the map below. The Mitchell Water Supply System is the largest within the EGW region, providing drinking water to approximately 22,000 customers within major towns such as Bairnsdale, Lakes Entrance, Metung, and Paynesville. All systems are independent of each other and none of the systems are connected to the Victoria Water grid.

3. What is an Urban Water Strategy?

The EGW Urban Water Strategy (UWS) is the key planning document, and the technical work that underpins it, to deliver safe and sustainable water to our urban areas. The UWS includes plans for securing water supplies over the next 50 years. It considers uncertainty with population levels, climate change and climate variability. It also includes a Drought Preparedness Plan (DPP) which details the supply of water in drought.

The objective of the UWS is to support the development of resilient and liveable communities while balancing social, environmental, and economic costs and benefits across the water cycle. The UWS is revised every five years in response to changing patterns of supply and demand.

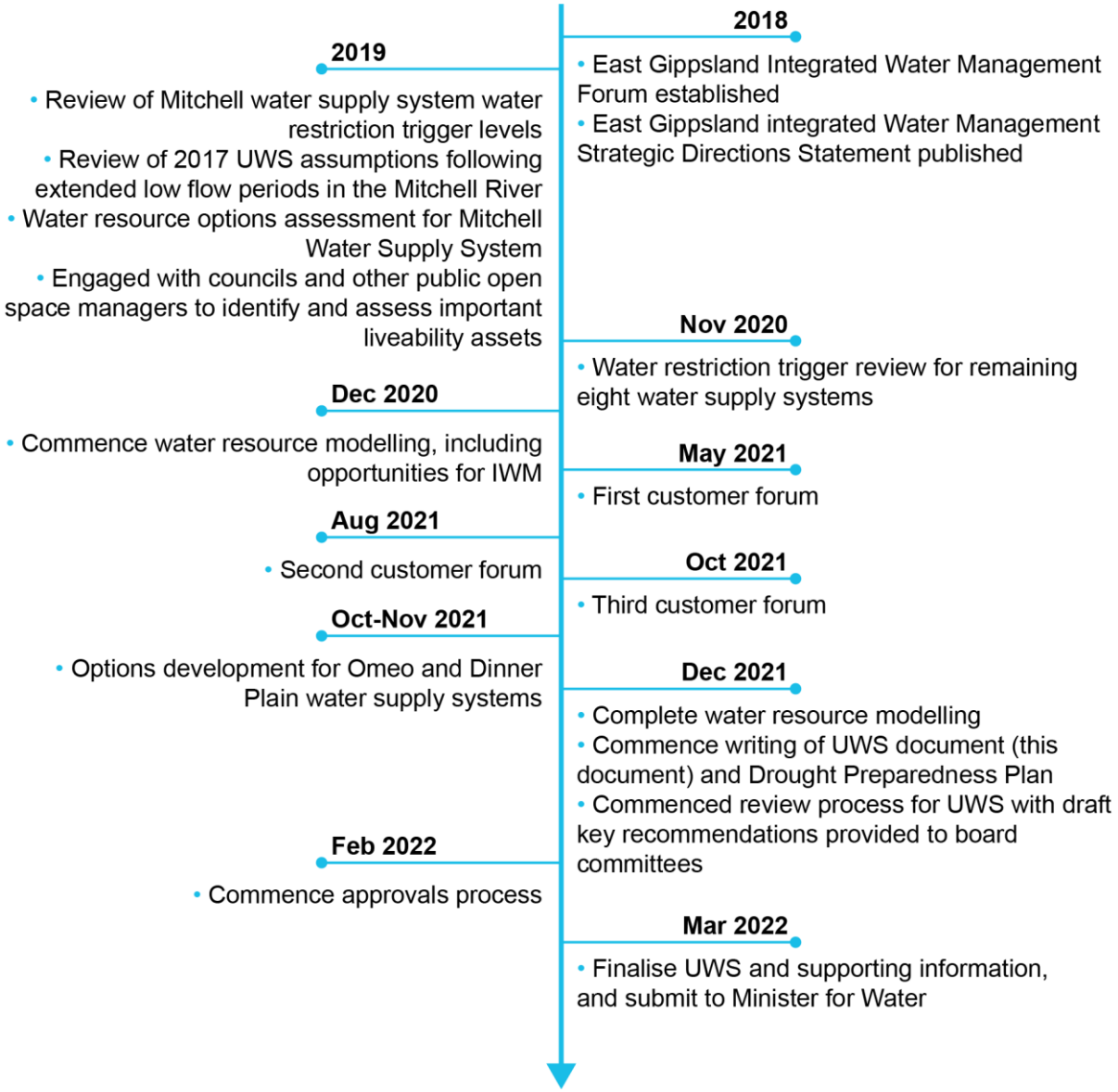
A summary of how this UWS fits into the wider plan to secure Victoria's water supply is shown below.



4. Our approach

The development of our UWS is a process that builds on previous strategies. Since the release of the 2017 UWS, water restrictions have been reviewed, water resource modelling and a bulk sewerage assessment undertaken, and options developed. Through this process, extensive engagement with partner agencies and customers has been undertaken to shape the UWS so that it meets their needs. A summary of the process to develop the UWS is shown below. Further detail on these process steps is in the Work Undertaken section later in this UWS.

Developing the UWS has occurred in recent years. As the diagram below shows, this has been a complementary process of engagement of stakeholders and customers to inform technical studies. Although the process is shown below as linear, there are many feedback loops between engagement and technical work to progress through the process.



Work undertaken

To develop our UWS we have adopted scenarios that apply the latest Victorian Government guidance on climate change projections and commissioned independent technical experts to review and develop our water supply models and water demand forecasts. This allows us to have confidence in the timeframes for the quantity of water demand to supply, and uncertainty associated with these forecasts. We have undertaken the following technical work packages to support the development of this UWS:

- Reviewed and updated our water restriction trigger levels to reflect our recent experiences following the 2017-2019 drought.
- Engaged consultants to support facilitation of customer engagement, particularly with our Customer Committee, to work through the modelling results, and options development and assessment.
- Engaged water resource modelling consultants to update and develop hydrological models for the Mitchell and Orbost Water Supply Systems respectively. These same consultants also developed simplified streamflow models for the remaining seven smaller water supply systems. Climate change, population-based water demand, and operational scenarios were then run to assess each water supply system's ability to meet customer demands.
- Engaged engineering consultants to assess the capacity for trunk sewers, wastewater treatment plants and water reuse facilities, to identify any potential opportunities for IWM initiatives.
- Where a shortfall in supply has been identified, demand reduction and increased supply options have been developed. In some cases, this predates the current UWS. For the Mitchell water supply system, options were developed the 2017-2019 drought. Options were also developed for the Dinner Plain and Omeo water supply systems.
- Engaged water resource planning consultants to support the development of this UWS document and Drought Preparedness Plan.

Type of options available

Our technical analysis has enabled us to consider a range of ideas to help us find or save water. These can be broadly classified as either demand management or supply augmentation. These options and the responsibility for implementing are shown in more detail below.

Supply	Demand
• Buy water from other water corporations • Build new off-stream storages • Upgrade existing off-stream storages • Recycled water for direct drinking water use (currently not a viable option) • Recycled water for non-drinking water uses • Groundwater supply from new bores, or upgrading existing bores • Groundwater recharge • Desalinated water • Transfer water from other east gippsland catchments • Capture and reuse of rainwater, e.g. rainwater tanks for garden watering • Capture and reuse of greywater for non-drinking water uses	• Change tariffs (pricing) to influence customer demands • Reduce evaporation from EGW water storages • Reduce leaks from water mains and improve water supply system operation • Plan and design urban areas for reduced irrigation and other water needs • Plan and design buildings to include efficient fixtures and appliances, with reduced cooling needs • Update water saving rules • Recycled water for non-drinking water uses • Groundwater supply from new bores, or upgrading existing bores at a local scale • Stormwater harvesting for non-drinking water reuse • Community education on water conservation and the value of water • Improve water efficiency for industry and in the home, e.g. efficient fixtures and appliances

Using all available water more efficiently is fundamental to making the most of a finite resource; building the resilience of cities, towns, farms and industries; and creating opportunities to return water to Traditional Owners. It is the most cost-effective way to help manage supply and demand. When planning for difficult conditions such as droughts and water shortages, our first goal is to reduce the amount of water lost or wasted, before taking other measures such as investing in new sources of manufactured water.

East Gippsland Water will support the implementation of the Central and Gippsland Sustainable Water Strategy, including the water efficiency initiatives below:

- Better information and standards for appliances
- Water saving targets for new homes and renovations
- Incentives to improve water use in rental properties
- Installation of rainwater tanks
- Undertaking showerhead replacement

Adaptive planning

There are many sources of uncertainty, such as the impact of population growth and the effects of climate change. We can only explore different scenarios that describe how the future might look, depending on assumptions we make about key sources of uncertainty, i.e., scenario planning.

Scenario planning tells us that, depending on the conditions that might arise, the action required to meet future needs could be very different. For example, the actions needed to secure urban water supplies are typically very different in scale and timing depending on the assumed impacts of climate change into the future. Victoria is expected to continue to get warmer, but the extent of warming varies depending on the assumed emissions scenario. Rainfall projections are associated with even larger uncertainties compared to temperature projections, because rainfall varies more in time and space than temperature.

Despite uncertainty about the effects of climate change on rainfall, we must still make decisions about when and how to respond to meet future water needs, or otherwise there is a risk that we will need to impose harsh water restrictions, more often and for longer, or that we could run out of water. To manage this risk, we must always be ready to act in a way that responds to whatever conditions we find ourselves facing. A proportionate response needs to find the right balance between acting too early or investing too much - which impacts customer prices - and acting too late or investing too little, which impacts customers' level of service and may increase costs due to sudden, reactive expenditure.

Adaptive planning is a way of managing uncertainty. It allows for ready adjustment in response to new conditions or better information, making it particularly useful when planning for an uncertain future. Reflection on any recent events, such as low flow events in rivers, is important to ensure that we learn from recent experience. These lessons can then be used in future decision-making and reviews of water resource planning.

Adaptive planning recognises that a combination of actions, sequenced over time - with some actions taken now, and some actions that may be taken in the future - can lead to a most responsive and resilient planning strategy.

An adaptive planning approach also enhances system resilience - as having a diverse portfolio of actions planned over time gives us the flexibility to respond to unprecedented events when they occur. For example, our ability to manage disruptive, unforeseen emergencies, or meet changing community expectations about environmental and cultural needs, or respond to rapid technological advancements, can all be optimised with adaptive planning.

5. Recognising and supporting Aboriginal values

Aboriginal people know water is essential to life, and to creation. The Aboriginal community have a strong cultural connection with East Gippsland. Aboriginal communities in East Gippsland include Gunaikurnai, Bidwell and Ngargio Monero. We are committed to working with Aboriginal people to learn from each other, care for Country, and deliver on priorities through the Gunaikurnai Whole of Country Plan.

The Gunaikurnai people are recognised by the Federal Court and the State of Victoria as the Traditional Owners of a large area of Gippsland spanning from Warragul in the west to the Snowy River in the east, and from the Great Divide in the north to the coast in the south; approx. - 10% of the state. GLaWAC is the Registered Aboriginal Party (RAP) for the Gunaikurnai, the Traditional Owners of our Country, as determined by the Victorian Aboriginal Heritage Council under the Aboriginal Heritage Act, 2006.

In 2015, the Gunaikurnai Whole of Country Plan was published by GLaWAC. The plan aims to bring together and add to the discussions that Gunaikurnai people have had over the past two decades during the fight for Native Title and shows how they are now going to move forward. The plan states 'As Gunaikurnai, we see our land (Wurruk), waters (Yarnda), air (Watpootjan) and every living thing as one. All things come from Wurruk, Yarnda and Watpootjan and they are the spiritual life-giving resources, providing us with resources and forming the basis of our cultural practices. We have a cultural responsibility to ensure that all of it is looked after.'

In November 2020, the first formal hand-back of water rights to Traditional Owners by the Victorian Government was accomplished; GLaWAC received 2 GL on the Mitchell River. This step in the right direction recognises the importance of gaining rights to water to restore customary practices, protect cultural values and uses, gain economic independence, and heal Country.

EGW continues to focus on building strong and respectful relationships with GLaWAC. Protecting cultural heritage and maintaining connection to Country are fundamental to retaining cultural links for present and future generations of Aboriginal people, since their culture and the environment are so closely linked.

Some examples of EGW and GLaWAC working together include the:

- Gippsland Water Alliance Memorandum of Understanding
- Gippsland Environment Agencies and GLaWAC Partnerships Agreement
- East Gippsland IWM Forum and Practitioners Group
- Gippsland Lakes Delivery Managers Group membership
- GLaWAC engaged as a key contractor
- Multiple projects partnering with GLaWAC

There is ongoing engagement with Traditional Owner groups east of the Snowy River via the Aboriginal Roadmap and the Central and Gippsland Sustainable Water Strategy processes, as well as collaborating with the East Gippsland Catchment Management Authority (EGCMA) on ways to improve engagement with these groups and individuals, to provide opportunities for conversations and input, while managing the overall engagement burden.

EGW is committed to working with Aboriginal people. EGW will continue to work closely with GLaWAC to maintain and grow partnerships, opportunities, and projects. EGW will continue to develop relationships with Far East Traditional Owners to create opportunities to hear their priorities and act where there is unity.

The EGW UWS is built on the foundations of the draft Central and Gippsland Sustainable Water Strategy, utilising the quadruple bottom line. This approach manages water holistically to care for Country and people, bringing great benefits to everyone living in the region: healthy rivers, happy and healthy people, and thriving towns and regions. The quadruple bottom line approach considers not only economic or financial results or benefits, but also social, environmental, and cultural factors and outcomes. Consideration of all four elements should bring community wellbeing, prosperity, and jobs.

6. Partner agencies and stakeholders

Where we are now

We have been working with our partner agencies, including the DELWP-led development of the Central and Gippsland Sustainable Water Strategy, where EGW is represented on both the Consultative Committee and on several working groups. In addition, we have had a senior representative from the EGCMA on secondment to EGW for the last six months, supporting the development of our regional partnerships. Our Board and Committees have also been active in developing this UWS.

Partner agencies and stakeholder groups engaged as a part of the development of the UWS included:

- Traditional owners
- Local Councils
- Government departments and authorities
- Neighbouring water corporations
- Internal staff and leadership team
- EGW's Board
- EGW's Customer Committee

The involvement of these stakeholders is summarised below.

Engagement Activity	Timing	Description
Customer Committee Forum	May 2021 - December 2021	• Introduced the UWS process, their role, and the challenges EGW faces in providing long-term water security to the communities of East Gippsland. • Presented technical modelling results for discussion, including the need to act for some systems. Presented customer and stakeholder engagement findings to inform discussions. Set an agreed levels of service and minimum level of service. • Presented data on the impact of Demand Management and IWM on drinking water demand. Presented the UWS outcomes.
Partner agency engagement	November 2021	• Chair of the East Gippsland IWM Forum and lead for the East Gippsland IWM Practitioner's Group. • Previous engagement with councils and other public open space managers to identify and assess which important liveability assets would be impacted under restrictions and the extent to which they should be exempted or covered under a Water Use Plan has already occurred as part of 2017-19 drought. These will be reviewed as required.
Traditional owner engagement	August 2021 - February 2022	• In person/virtual conversations and presentations to Traditional Owners. • Participation in various Gippsland partner agency groups and partnering for major project opportunities. • September 2021 joint workshop with GLaWAC and other Gippsland based water corporations and catchment management authorities.
Price Submission aligned engagement – Phase 1	March 2021 - May 2021	• Explored where preferences, needs and priorities are for customers, key stakeholders and the wider community using open-ended survey questions.
Price Submission aligned customer engagement – Phase 2, and annual customer satisfaction survey	May 2021 - December 2021	• Considering the findings from Phase 1, more detailed questions were asked.
Internal engagement	July 2019, November 2020 - March 2022	• Engagement with EGW's operations team on water restriction trigger levels for each water supply systems. • Engagement with Board at committee meetings on progress and approvals. • Engagement with EGW's operations and master planning teams on technical work, Drought Preparedness Plans and UWS.

Each engagement stage considered the stakeholders communication preferences, accessibility, and engagement objective. Engagement methods included meetings, forums, survey, and presentations. Regular updates were undertaken with stakeholders and partners.

What we are doing

Engagement with our partner agencies and stakeholders is continuing, with several initiatives referred to in this UWS ongoing; e.g. EGW's involvement in various partner agency working groups and forums.

Actions

1. Continue to engage with partner agencies and stakeholders beyond the finalisation of the UWS.

7. Meeting community expectations

Where we are now

The community serviced by EGW has indicated in our 2021 Annual Customer Satisfaction Survey that there are issues more important to them than keeping bills low. These include:

- Bringing water and/or sewer services to small towns
- Creating and supporting local jobs
- Investing to improve the local environment
- Helping customers in genuine financial distress
- Investing in educating the community about water

Issues of less importance than keeping bills low include:

- Reducing the number of unplanned water outages
- EGW giving discounts and other support to community groups

What we are doing

We are committed to being a recognised customer-focused and community-minded organisation. The feedback we have received from customers across all nine of our water supply systems has been important in the development of the UWS - helping to inform the levels of service we provide our customers, and when action is needed to ensure demand is met.

Where possible we have aligned engagement to reduce the burden of surveys and the like on our customers. Between March and May 2021 as part of our early price submission engagement we explored the concerns and expectations of customers. We followed this up with additional UWS specific questions in our annual customer satisfaction survey (October 2021) - assessing support for various methods to address lower water availability and the increasing demands, approaches to increase community understanding of water issues, and provision of water during extreme heatwaves/bushfires.

Actions

1. We will continue to engage with customers on issues such as pricing and water security to inform our decision-making.
2. We will update the community on our water security status and forecast each year by publishing an Annual Water Outlook.
3. The customer forum supports the construction of a third off-stream storage at EGW's Woodglen site in PS2023 to provide long-term water security for the Mitchell Water Supply System, subject to the following initiatives:
    - That we will pursue community education regarding water conservation and the value of water to drive drinking water demand reduction.
    - That we will pursue small and large-scale IWM initiatives to reduce drinking water demand.
    - That we will work with the Customer Committee to be active in long-term regional planning for East Gippsland, particularly regarding water resource planning and long-term regional amenity.
    - That we will considers the reframing of water resource levels of service in future UWSs to encourage a more positive approach to water use.
    - That we will retain water restrictions in our Drought Preparedness Plan as a key mechanism to ensure water security during unforeseen events, such as drought or water quality events.

- That we will explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This could include desalination, groundwater, and recycling.

8. Climate change

Where we are now

Our water resources depend on the climate, which means that water demand, storages and water sources need to be carefully managed to ensure supply. The impacts of climate change are expected to result in a drier, hotter climate that will reduce available water from traditional water sources and affect the quality of that water.

Our future climate is projected to pose a significant risk to communities in the region. Coupled with population growth, the impacts of climate change need to be considered – we need to plan for a future with a larger population and less water than we have today.

The Victorian Government, via the Minister for Water, has set clear expectations that water corporations need to respond to climate change through both mitigation (towards zero net emissions) and adaptation (continuing to provide water services in a changing climate).

Given the water sector is responsible for the largest proportion of government carbon emissions, we can provide leadership on climate change. We can support residential and commercial customers to reduce carbon emissions and water usage and collaborate with other sectors for more effective mitigation and adaptation responses.

What we are doing

This strategy is underpinned by our climate change mitigation and adaptation strategies, as well as best-practice guidance from the Victorian Government. We have undertaken detailed scenario modelling of water availability and used this to inform the strategy. We will annually assess the effects of climate change including seasonal climate outlook, status of water storages, effects of bushfire and impacts on water quality.

In addition, we continually monitor the quality of water drawn from waterways and groundwater, which can be affected by events such as heavy rainfall and bushfires – likely to be exacerbated by climate change. We are implementing management measures to respond to these threats, including catchment protection measures, active operational management, and continuous improvement of our treatment systems.

We aim to achieve net-zero emissions by 2035.

Actions

1. We will continue to deliver initiatives to reduce our carbon emissions in line with EGW climate change management strategy.
2. We will ensure that water treatment plants are resilient in managing raw water quality changes associated with changing climate conditions and continue to deliver consistently high-quality drinking water to customers.
3. We will consider the need for a more rigorous assessment of the hydrologic impact of the 2020 bushfires on future runoff, and on future groundwater recharge and discharge for bushfire affected areas prior to EGW’s next UWS - like the hydrologic analysis previously commissioned by DELWP in relation to the 2003 and 2006/07 major bushfires.

9. Servicing a growing population

Where we are now

Water underpins social health and wellbeing and has a strong impact on the types and success of industries that can operate in the region. Based on a review of state government data, water connections in the EGW service region are currently increasing by 1.5% annually. This growth is uneven between various townships, meaning that some areas will require larger upgrades to the supply and treatment system than others.

The challenge for us is to ensure all communities and industries are supported by sustainable services.

What we are doing

We undertake scenario modelling that considers the potential range of population growth that will influence future demand. We undertake regular reviews of population growth and work closely with councils to understand how we can continue to service the growing region.

Making the most of the water resources that are available is also critical to managing demand and supporting a prosperous region - for example use of non-drinking water supplies where suitable.

This UWS was developed in 2021 and as such, only data up to and including the 2019/20 financial year was available for modelling. Changes due to the effects of population movement caused by COVID-19 have not been fully accounted for in water supply and demand projections.

Scenario modelling included consideration of the following:

- Historical changes in the number of water and sewer connections within each network.
- Historical changes in water use within each water network.
- Victoria In Future 2019 population projections.
- Extrapolation of growth projections beyond limits of growth projections to 2070.
- Derivation of higher and lower growth projection for sensitivity testing purposes.
- Allowance for projected climate change influencing water demand.

Actions

1. We will proactively plan for the replacement and upgrade of infrastructure to accommodate predicted population changes.
2. We will continue to work with local councils and other partner agencies to sustainably manage growth in the region, while returning water to Traditional Owners and protecting the environmental value of our catchments.
3. We will continue to monitor growth in the region and adjust our growth forecasts to update projected water demand.

10. Delivering integrated solutions

Where we are now

Our communities and stakeholders have an interest in considering innovative ways to supply quality water and sewerage services.

The Water for Victoria plan also encourages technological, organisational, and operational innovation focussed on improving supply of a resource facing increased future demand and reduced availability.

We continue to investigate opportunities to apply innovation to the provision of water and sewerage services, with "passionately innovative" being one of our four trademark behaviours. For example, this could involve a system wide review to find opportunities for improvement in a 'business as usual' operating environment, or it could involve conceptualising future infrastructure differently.

What we are doing

At the core of IWM is collaboration, we participate in forums and look for opportunities for integrated planning and alternative water resources that deliver wider benefits to the community.

We will continue to implement demand management measures such as:

- Managed aquifer recharge
- Reduction of water losses from assets using tools such as pressure zones and addressing leaks
- Community education
- Continue with incentive schemes to improve domestic appliance efficiency, commercial and industrial water use, and capturing rainwater

An IWM plan has been developed for the Bairnsdale area with a strong focus on integrating the outcomes and multiple benefits of several identified IWM project ideas in the area, including but not limited to:

- Wetland development to capture and treat stormwater in the Crooke Street and McMillan Street area of East Bairnsdale
- Opportunities for water sensitive urban design, stormwater harvesting and re-use at Calvert Street Educational Precinct; and,
- Water and vegetation management in the vicinity of Magees Gully, Bairnsdale Livestock Exchange, and the Bairnsdale Oval.

The project has involved the continuation of investigations into the supply of treated wastewater from the Bairnsdale Wastewater Treatment Plant to the nearby Bairnsdale Livestock Exchange and Bairnsdale Oval, plus a review of the management of the complex interface between Magees Gully, the Bairnsdale Livestock Exchange, and Macleod Morass.

Funding has also been made available for an assessment of alternative water sources for snow making at Dinner Plain. The successful grant application includes installation of a tank to enable collection of water during off-peak periods and support additional snow making in the winter period. The tank could also be used for recycled water in the future if the option becomes available.

Other innovative initiatives EGW is working on are:

- Trialling the use of smart water meters in Bemm River in 2022
- Use of air and underwater drones for both preventative maintenance and managing safety risks
- Use of vacuum drones to clean tanks, and possibly storages in future, reducing the length of time tanks are not in service
- Increased on-line digital monitoring to collect real-time data

- EGW continues to be an active participant in the Intelligent Water Networks Program, which aims to trial and showcase new technologies and innovations for Victorian Water Corporations. We also have a representative on the Executive Group for this program

Actions

1. We will continue to look for opportunities to implement innovative water management techniques.
2. We will continue to consider projects that provide an additional water resource, energy saving or community benefit, such as managed aquifer recharge.
3. We will continue to partner with key agencies in the IWM Forums.

11. Supporting environmental health

Where we are now

Many of Far East Gippsland's waterways are in near pristine condition because most of the area is covered in native forest. They support a diversity of native fish species, including the threatened Australian grayling, which rely on healthy streamflow with variable flow regimes.

Water resource management must balance the needs of competing uses, including the needs of the environment. It is recognised that some waterways would benefit from additional environmental flows, particularly as the impacts of climate change potentially reduce streamflow across the region in the future.

We are committed to the philosophy and practices of environmental stewardship. This is outlined in our Environment Policy.

What we are doing

We harvest water in accordance with the conditions of our bulk entitlements, which prioritise flows for the environment.

Long-term water resource assessments and the Central and Gippsland Sustainable Water Strategy developed by the Victorian Government identify priorities for environmental water. We are committed to exploring further opportunities to help meet those needs.

Actions

1. We will work with the East Gippsland Catchment Management Authority, Victorian Environmental Water Holder and Traditional Owner groups to explore further opportunities to harvest water so that environmental and Aboriginal values are supported.
2. We will proactively monitor, operate, and upgrade wastewater treatment plants to identify and address environmental risks.

12. Water quality

Where are we now

Water quality is as important as water quantity. Poor water quality has major consequences for the health of people, livestock, rivers, wetlands, and aquifers. Contributors to poor water quality include rising salinity, increasing sediment and nutrient loads, changing pH and temperature level, and reduced dissolved oxygen. Water quality issues (for example, high sediment in rivers during and after heavy rainfall) may cause short term water shortages.

There have been significant impacts in recent years on water quality due to bushfires.

Environmental flows help to maintain water quality, support flora and fauna and protect public health and safety. The community values the rivers in East Gippsland for their healthy native vegetation and wildlife, scenic qualities and as a place of recreation.

What we are doing

The delivery of safe drinking water to the community is fundamental and EGW monitors drinking water quality regularly in all water supply systems to ensure compliance with the Safe Drinking Water Act 2003, Safe Drinking Water Regulations 2015, and the our Customer Charter.

We operate a Drinking Water Quality Risk Management System, which has certification in accordance with the Safe Drinking Water Act 2003 and includes specific compliance standards for quality and frequency of sampling.

Regulatory audits are undertaken biennially by certified auditors appointed by the Department of Health (previously the Department of Health and Human Services) to ensure the integrity of this system. EGW undertook such a regulatory audit in 2020 and a minor non-conformance relating to risk assessment criteria was identified, which has since been corrected. This had no impact on the quality of water being delivered to customers. The system is to be audited next in 2022.

Actions

1. We will continue to install infrastructure to reduce the need to harvest water during heavy rainfall events, such as construction of a new raw water tank at Buchan.

13. Our supply systems

Assessment summary

For each system in EGW's area, we have undertaken the same process to develop a strategy to ensure water supply security for the next 50 years. A summary of this process is shown below.

This UWS is a 50-year strategy that will be revisited every five years. This makes our UWS the heart of our adaptive planning for a secure water future. It allows us to continually look forward to plan for the evolving longer-term, while making sure that we are periodically reviewing and adjusting our shorter-term actions.

Uncertainty is greater the further into the future we look. Adaptive planning ensures we make best use of the time available to respond to whatever conditions emerge. Our UWS does this by framing what we propose to do in each of our systems over different time horizons and circumstances:

- **Next 5 years** – These actions correspond with the next 5 years, until the Urban Water Strategy is reviewed in 2026-27, and our next regulatory pricing period - these actions include both implementation and readiness activities
- **5-20 years** - These actions and opportunities correspond to the next 5-20 years to ensure a secure water future for our region.
- **20-50 years** – These long-term actions will need to be revised closer to implementation.
- **Emergency** - What we will do in the event of an emergency, such as drought, to ensure that service levels are maintained.

Our plans and actions are informed by comprehensive modelling of our systems. Longer-term planning is based on forecasting system performance for a given level of service under a range of future climate and population growth-based water demand scenarios. We can also forecast how our storages might behave in the short-term, which helps us to understand how resilient our supplies are under potential worst-case scenarios of low inflows. It also allows us to be able to act with more confidence, implementing actions when necessary.

Levels of service

We consider a range of plausible future climate scenarios identified by the Victorian Government, noting there is no 'most likely' scenario. We also consider a range of possible demand scenarios, principally influenced by projections of population growth. The combination of scenarios is used to inform the possible timing of actions that may be required to maintain service levels in future.

Our scenario-based planning means we consider a wide range of possible future outcomes. However, we must then decide which potential circumstances we invest in to protect against.

For example, we could aim to deliver new water supply sources that can reliably meet demand under even the worst drought imaginable - but the cost of this for customers would be very high. Alternatively, we can accept that there might be some chance that we need to curb our demand - through water restrictions - during the less frequent, drier years.

This trade-off represents the level of service that we need to establish and maintain over time. Because it directly impacts how much we invest, and therefore our water prices, customers have a critical role in helping to inform this decision.

Our UWS has been developed based on the following agreed levels of service:

1. **Frequency of Level 1 and Level 2 restrictions** – 1 in 10 years.
2. **Frequency of Level 3 and Level 4 restrictions** – 1 in 15 years.

These levels of service have been developed in consultation with EGW's Customer Committee during the engagement for the development of this strategy.

The minimum level of service is defined as the volume required to meet Stage 4 restricted demand.

Modelling

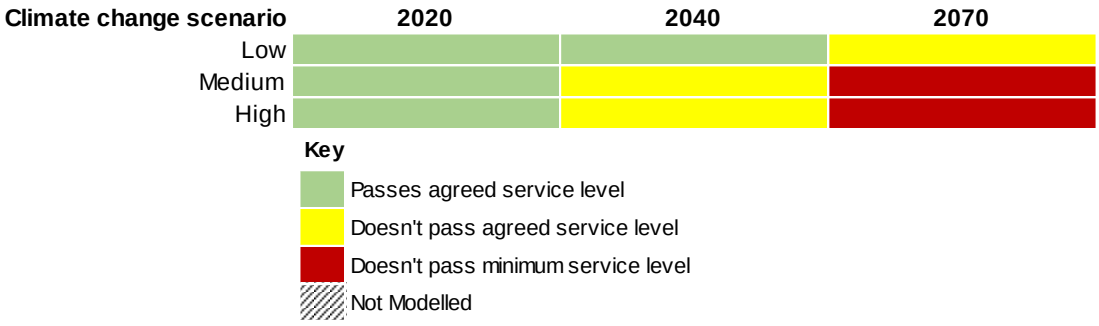
Scenarios to test the reliability of supply for each water supply system were developed after considering State Government guidance from the Urban Water Strategy Guidelines (DELWP, 2021) and Climate Change Impact Assessment (DELWP, 2020). According to the Urban Water Strategy Guidelines, these strategies are to "utilise a fifty-year scenario-based planning horizon which considers changes in population, demand, climate and other system shocks and stresses in setting out the water supply and demand measures needed to balance supply and demand". As noted in the UWS guidelines, scenario planning focuses attention away from estimating a single most likely event to understanding what could occur under different circumstances. Scenarios are neither forecasts nor predictions, but rather they represent alternative potential future conditions that are both possible and credible. Scenarios can also be used to challenge conventional assumptions.

The water supply systems we manage typically have small off-stream storages and are not well linked to alternate water sources, compared to other part of the state supplied by on-stream storages. Because of this, it is more difficult to predict shortfalls using a supply and demand graph on a yearly timescale. Therefore, a modified methodology has been developed that uses discrete time horizons as shown in the table below.

Scenario	2020	2033	2040	2070
Historic climate	●			
Post 1975 climate	●		●	●
Low climate change	●		●	◉
Medium climate change	●		●	◉
High climate change	●		●	◉
Post 1997 climate change	●		●	◉
High climate change with drier warm season	●		●	●
High climate change + max impact of 2020 bushfires		●		
Options	●	◉	●	◉

● All systems
● All systems excl. Mitchell & Orbost
◉ All systems excl. Mitchell
◉ Mitchell & Orbost Systems only

While the table above shows the range of scenarios modelled for each water supply system, for ease of interpretation, the results of the scenario modelling for each system have been summarised in each system discussion section using the format of the table below.

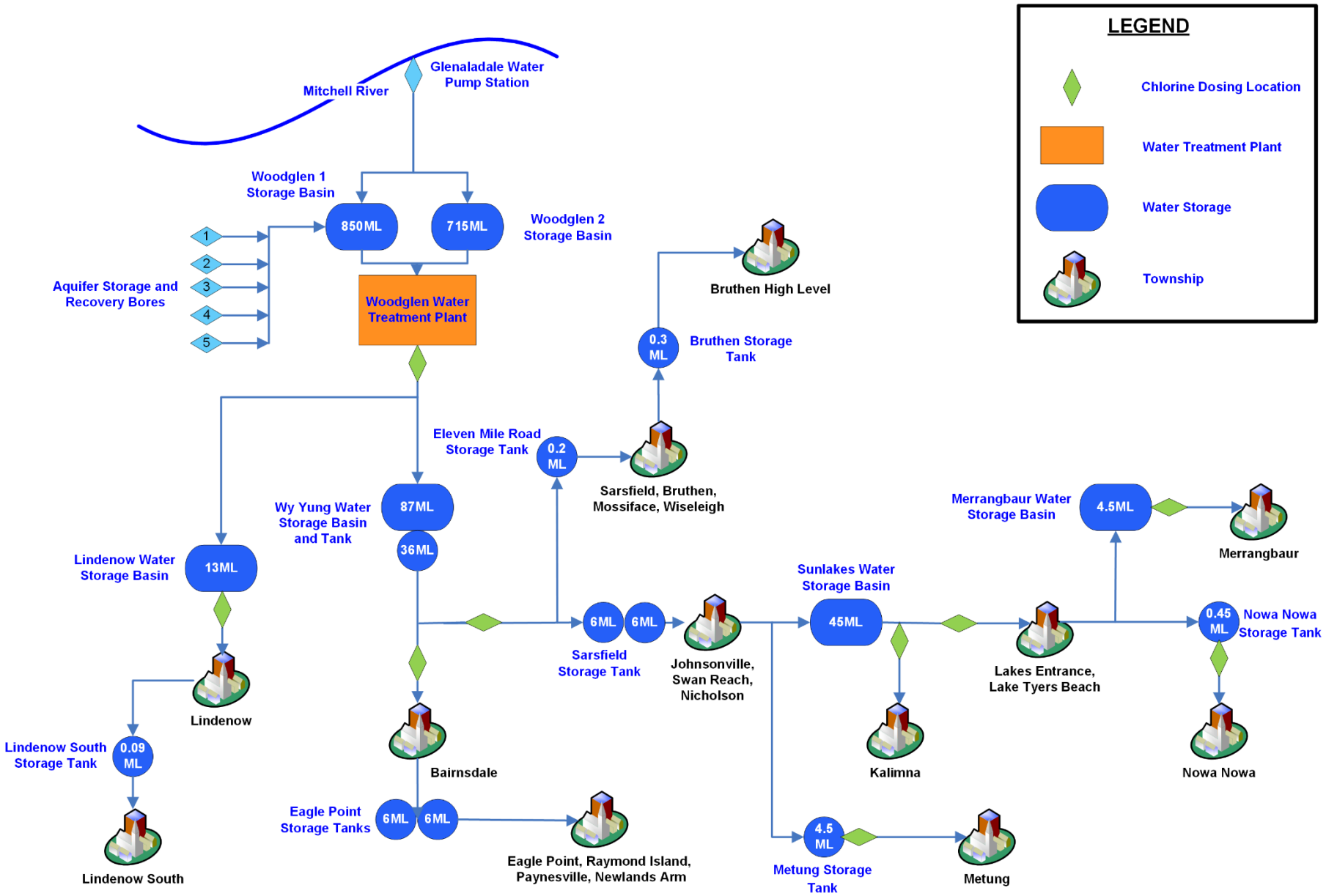


Mitchell System

The Mitchell River water supply system is EGW's major supply system servicing the following townships:

- Bairnsdale / Wy Yung / Lucknow
- Lindenow / Lindenow South
- Paynesville / Eagle Point / Newlands Arm / Raymond Island
- Metung
- Lakes Entrance / Kalimna / Lake Tyers Beach / Nowa Nowa / Lake Tyers Aboriginal Trust
- Nicholson / Johnsonville / Swan Reach
- Bruthen / Sarsfield

This system provides water to a population of approximately 30,000 people. A schematic of the system is shown on the next page.


LEGEND
Chlorine Dosing Location
Water Treatment Plant
Water Storage
Township
Mitchell River
Glenaladale Water Pump Station
Woodglen 1 Storage Basin
850ML
715ML
Woodglen 2 Storage Basin
Aquifer Storage and Recovery Bores
1
2
3
4
5
Woodglen Water Treatment Plant
Bruthen High Level
0.3 ML
Bruthen Storage Tank
Eleven Mile Road Storage Tank
0.2 ML
Sarsfield, Bruthen, Mossiface, Wiseleigh
Wy Yung Water Storage Basin and Tank
87ML
36ML
Lindenow Water Storage Basin
13ML
Lindenow
Lindenow South Storage Tank
0.09 ML
Lindenow South
Bairnsdale
Eagle Point Storage Tanks
6ML
6ML
Eagle Point, Raymond Island, Paynesville, Newlands Arm
6ML
6ML
Sarsfield Storage Tank
Johnsonville, Swan Reach, Nicholson
Sunlakes Water Storage Basin
45ML
Kalimna
4.5 ML
Metung Storage Tank
Metung
Merrangbaur Water Storage Basin
4.5ML
Merrangbaur
Lakes Entrance, Lake Tyers Beach
0.45 ML
Nowa Nowa Storage Tank
Nowa Nowa

Source water

The Mitchell water supply system is predominantly supplied from the Mitchell River, supplemented with a 'take and use' groundwater licence from the Latrobe Valley Group Aquifer, which is used when required.

Most of the water is pumped from the Mitchell River during the non-summer months by our Glenaladale Water Pump Station and stored in two off-stream storages at Woodglen, as well as our aquifer storage and recovery scheme in the Latrobe Valley Group Aquifer, which is co-located at our Woodglen site.

Water treatment

From the raw water storages and aquifer storage and recovery scheme (if in use), water is transferred to the Woodglen Water Treatment Plant (WTP). From the Woodglen WTP the treated water is distributed through the Mitchell system via kilometres of water mains, covered storages and tanks, water pump stations and disinfection stations to ensure high-quality drinking water is provided to all customers.

Wastewater treatment

While the Mitchell water supply system is one system; for wastewater, the same area is serviced by five sewerage systems, with wastewater treatment plants (WWTPs) located at:

- Bairnsdale
- Lindenow
- Lakes Entrance
- Metung
- Paynesville

Registered Aboriginal Party

GLaWAC is the RAP for the Gunaikurnai, the Traditional Owners of our Country, as determined by the Victorian Aboriginal Heritage Council under the Aboriginal Heritage Act, 2006.

Our challenge

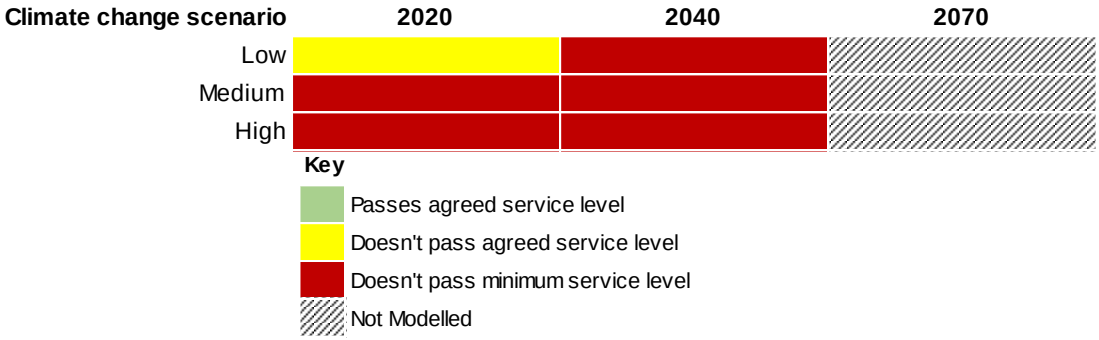
The Mitchell water supply system has a history of implementing water restrictions to ensure adequate water supplies to meet customer demands. This has been due to drought, bushfires, and severe wet weather events. The occurrence of these events, significantly influences the frequency of water restrictions. Without any actions, this frequency is likely to increase in the future.

The following parts of the sewerage systems servicing the same area as the Mitchell water supply system are modelled to be under capacity at some point in the planning horizon:

- Some large Bairnsdale sewers and the WWTP are modelled as being under capacity now with this getting more severe over time without action
- Lindenow WWTP is expected to be under capacity by 2070
- Some large Metung sewers, the WWTP and reuse site are modelled as being under capacity now with this getting more severe over time without action
- Some large Paynesville sewers and the reuse site are modelled as being under capacity now with this getting more severe over time without action

What is the scale of the problem?

A summary of the outlook for the Mitchell System is shown below.



Work is needed in the short term to ensure that we can continue to meet agreed levels of service to our customers in the event of drought.

In addition, action is required to ensure we can continue to provide sewerage services to the Mitchell water supply region without negatively impacting the environment.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Mitchell System describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

Option	Description	Timeframe
Maximise Mitchell River supply through additional storage at Woodglen	Increase availability of Mitchell River raw water supply through construction of additional off-stream raw water storage at EGW's existing Woodglen site. This is the key outcome of the UWS.	**Next 5 years**
Customer education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water. This includes treated water reuse from Lakes Entrance WWTP at various golf courses. At Bairnsdale WWTP we are already designing an addition to our WWTP to increase the quality of treated wastewater (Class A) for non-drinking purposes. This water will be used instead of drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water or desalination.	**5-20 years and beyond**
Additional Bulk Entitlement required	If the Mitchell River continues to be the sole water source for the water supply system, explore options to secure additional entitlement volume (to be held as bulk entitlement)	**20-50 years**
Addressing sewerage system capacity	Master plans have been developed, are in progress, or are scheduled within the next 5 years for the Bairnsdale, Lindenow, Paynesville and Metung sewerage systems to identify the preferred solution(s) to address the capacities issues. This will inform our actions to provide sufficient capacity to transfer, treat and dispose of wastewater in the Mitchell region.	**Next 5 years and then ongoing**
Addressing poor water quality	In the event of water quality issues (i.e. abnormally high turbidity following a bushfire that exceeds the capacity of the WTP) consider the following response options: • Review selective harvesting based on streamflow, turbidity and forecast additional rainfall • Use of lamella clarifiers to pre-treat river water to remove sediment to a suitable level for the WTP to handle • Treatment of water with poly-aluminium chloride (system already installed) • Water restrictions to reduce demand	**Emergency**
Emergency supply	Due to the volume of water required to supply customers in the Mitchell water supply system, options that are used for other systems such as water carting are not feasible. Instead, we ensure we have system redundancy using sprinklers to protect assets during fires, generators for back-up electricity supplies, and in-system storage to reduce the number of customers affected by individual outages. These are only a few examples; we also closely monitor weather forecasts, streamflow and water usage to support decision making around the use of water restrictions if required.	**Emergency**

Conclusion

If no changes to supply or demand are made, water restrictions will occur more frequently than the agreed levels of service. Therefore, immediate action is required for the Mitchell system to address an imbalance between when water is available in the river and when customers need the water. While a range of options have been looked at, in the short term more storage is required. Further storage increases or alternative options will be required in the future as the climate gets drier and population growth increases.

Additional large-scale augmentations are expected to be required now, and again in 2040 and 2070. As each augmentation is undertaken, the supply strategy will be adapted and updated.

Importantly, the Mitchell River is a culturally significant river for the Gunaikurnai people. In November 2020, the first formal hand-back of water rights to Traditional Owners by the Victorian Government was accomplished. GLaWAC received 2 GL on the Mitchell River. This is a momentous outcome and an essential first step towards water justice.

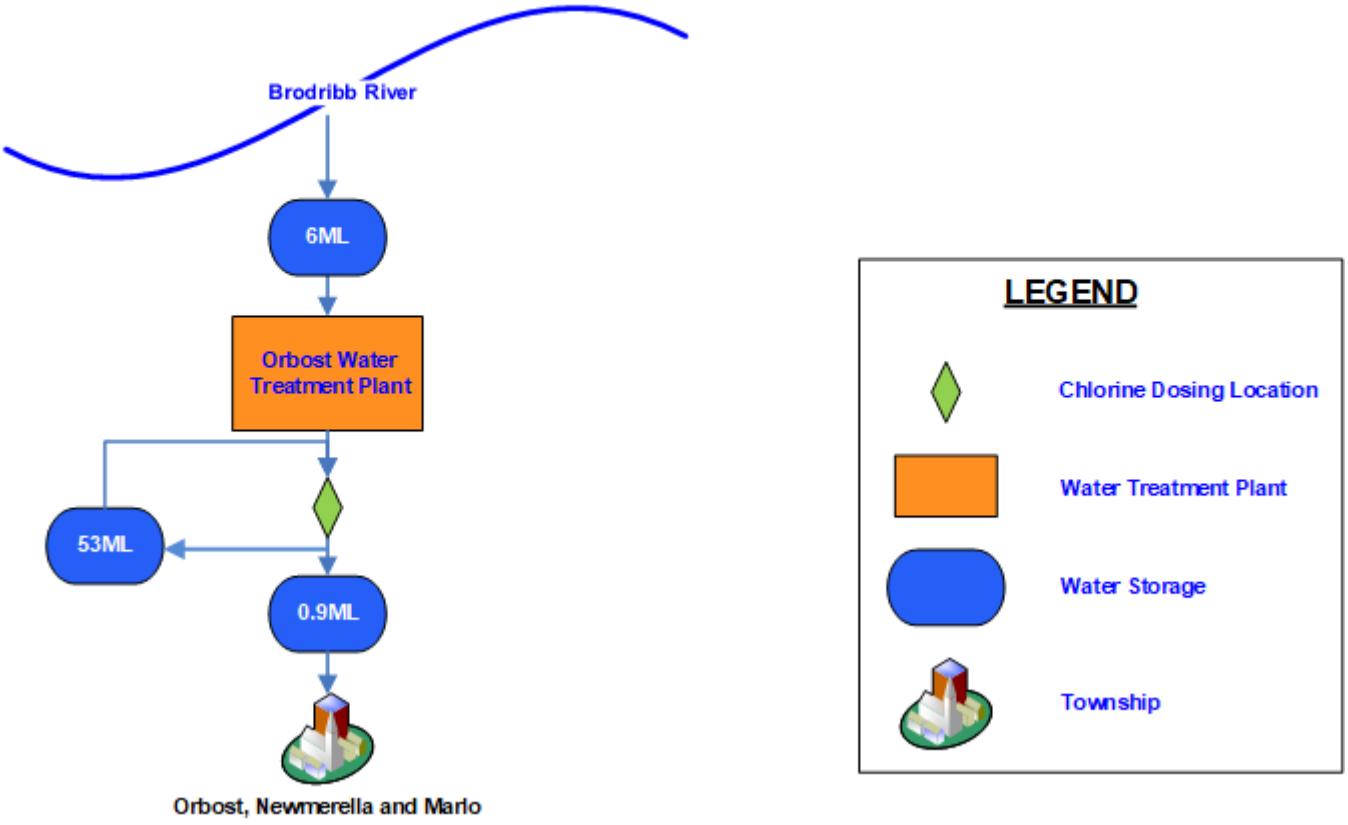
EGW is always looking for projects and opportunities to partner with GLaWAC to improve our people, cultural connection and environment.

Orbost System

The Orbost water supply system supplies the following townships:

- Orbost
- Marlo
- Newmerella
- Jarrahmond

This system provides water to a population of approximately 3,200 people. A schematic of the system is shown below.



Source water

Water is pumped from the Brodribb River diversion site via an 11 km rising main pipeline to the Orbost raw water basin.

Water treatment

The water from the Orbost 6 ML raw water basin is treated at the Orbost WTP and then stored in a clear water tank and storage basin with a combined capacity of 53.9ML.

Supply to Orbost, Marlo and Jarrahmond is via gravity; supply to Newmerella is boosted by a water pump station at Newmerella.

Wastewater treatment

Orbost and Marlo wastewater is treated at the Orbost WWTP and then reused to irrigate nearby tree lots and pasture.

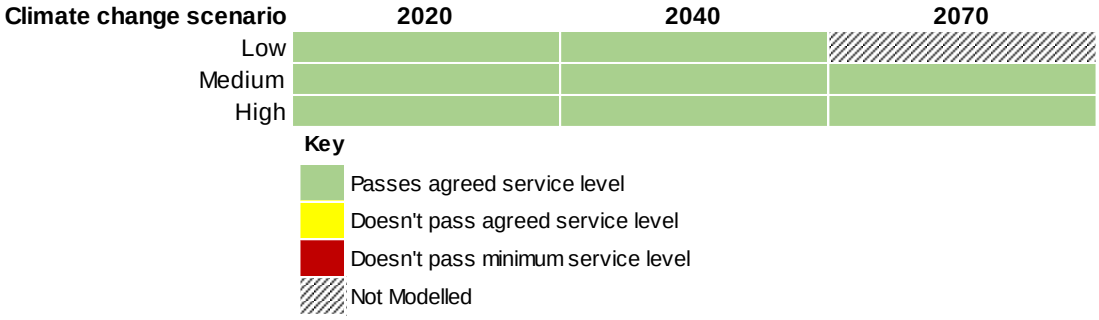
Registered Aboriginal Party

Traditional Owners have not been formally recognised for this area.

Our challenge

What is the scale of the problem?

A summary of the outlook for the Orbost System is shown below.



This shows that the Orbost system is very reliable, and apart from an increase in the WTP capacity expected to be needed by 2040, no further specific actions are required to secure Orbost's water supply.

Some large sewers in Orbost and the Orbost WWTP are modelled as being under capacity now, with this getting more severe over time without action. Action is required to ensure we can continue to provide sewerage services to Orbost and Marlo without negatively impacting the environment.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Orbost System describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

Option	Description	Timeframe
Streamflow modelling	Streamflow data collection needs to be improved to better understand river flows in the Brodribb River at the EGW offtake.	**The next 5 years**
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water or desalination.	**5-20 years and beyond**
Planning for WTP Capacity Increase	Develop a master plan for the Orbost WTP to ensure sufficient off-stream storage, WTP capacity and treated water storage to meet customer demands up to and beyond 2040, when there is projected to be a possible treatment capacity shortfall. This master plan will also identify off-stream water storage requirements to allow more selective harvesting of river water so that if the river water quality if poorer, we don't need to harvest water. This was the reason for water restrictions needing to be implemented for the Orbost water supply system following the 2019-20 bushfires.	**The next 5 years**
Addressing sewerage system capacity	Develop a master plan for the Orbost sewerage network and WWTP to identify the preferred solution(s) to address the capacities issues. This will inform our actions to provide sufficient capacity to transfer and treat wastewater for the Orbost sewerage system.	**Next 5 years and then ongoing**
Options assessment	Explore potential alternative sources of water for use in water shortage/water quality events, e.g., groundwater bores, recommissioning water supply assets.	**The next 5 years**
Emergency supply	Due to the volume of water required to supply customers in the Orbost water supply system, options that are used for other systems such as water carting are less feasible. Instead, we ensure we have system redundancy using sprinklers to protect assets during fires and generators for back-up electricity supplies to reduce the number of customers affected by individual outages. These are only a few examples; we also closely monitor weather forecasts, streamflow and water usage to support decision making around the use of water restrictions if required.	**Emergency**

Conclusion

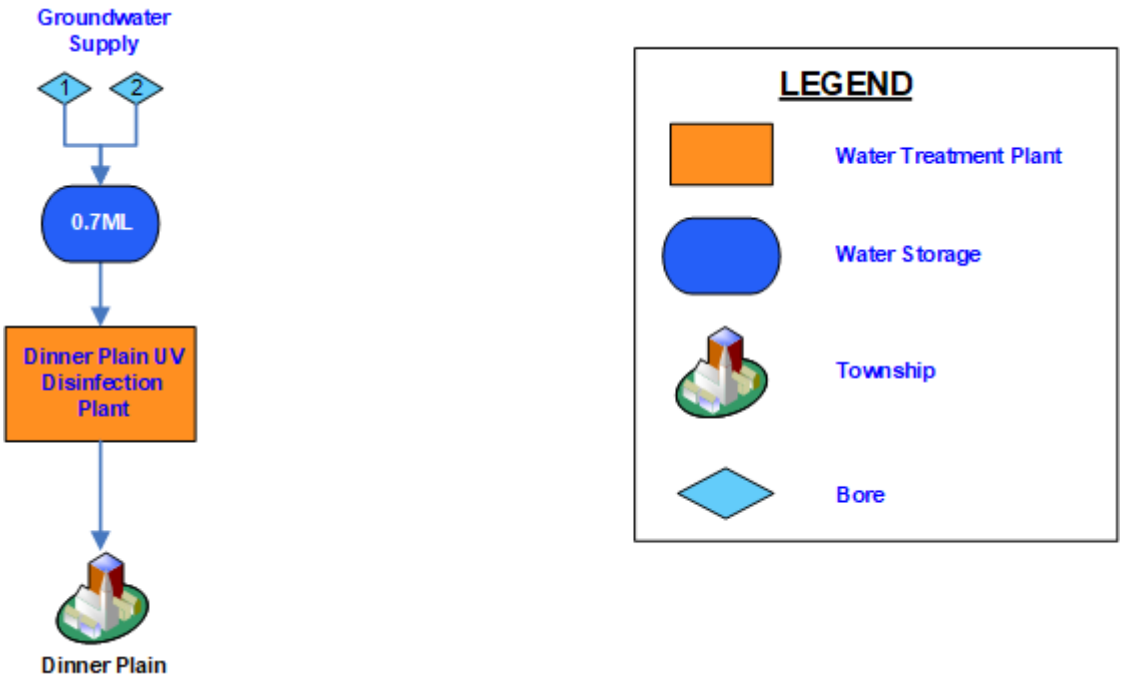
The Orbost water supply system is very reliable. It will stay that way until at least 2040. This reliability is enough to meet the current agreed levels of service and the minimum level of service, regardless of:

- Uncertainties in climate change on supply availability
- The possible impacts of forest regrowth on supply availability after the 2020 bushfires
- Higher demand.

Voluntary restrictions and/or a heightened awareness message to the community would also be relatively infrequent up to the year 2040.

Dinner Plain System

The Dinner Plain water supply system supplies the alpine township of Dinner Plain, providing water to a population of approximately 230 people. A schematic of the system is shown below.



Source Water

Dinner Plain is currently supplied by two groundwater bores, located approximately 50 m apart.

Water treatment

The bores pump to a 700 kL storage tank before being pumped to a UV treatment plant and the reticulation system.

Wastewater treatment

The Dinner Plain WWTP treats incoming wastewater and temporarily stores it in lagoons.

One hundred percent of the recycled water produced by the Dinner Plain WWTP is used to irrigate an alpine woodland.

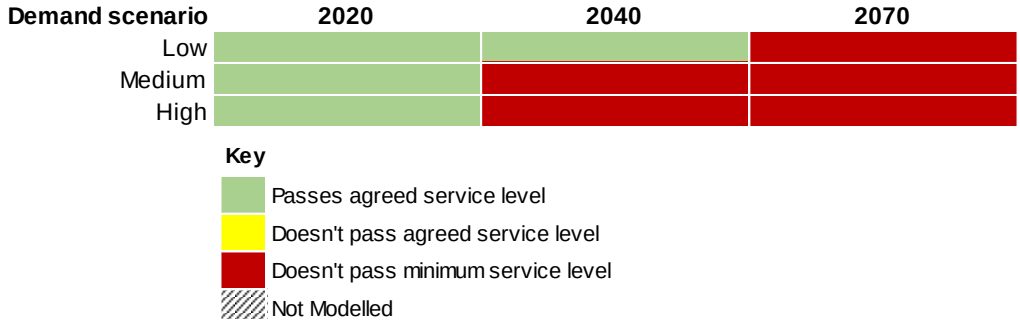
Registered Aboriginal Party

Traditional Owners have not been formally recognised for this area.

Our challenge

What is the scale of the problem?

A summary of the outlook for the Dinner Plain water supply system is shown below.



EGW's annual groundwater licence is estimated to be adequate to meet projected demands for Dinner Plain over the 50-year planning horizon. However, the groundwater licence has a daily extraction limit which influences the results summarised above.

The Dinner Plain WWTP and winter storage capacity are modelled as being under capacity now, with this getting more severe over time without action. Action is required to ensure we can continue to provide sewerage services to Dinner Plain without negatively impacting the environment.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Dinner Plain System describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

Option	Description	Timeframe
Decrease unaccounted for water	Continue to actively work to reduce the high unaccounted-for water which is due to burst mains, leaks, and faulty meters because of the alpine conditions. Measures to decrease leakage include: • Monitoring night flows • Listening for flow in meters and pipes during the summer period • Checking and fixing faulty meters • Insulating meters and pipes	**The next 5 years**
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include additional bore water.	**5-20 years and beyond**
Increase Storage	Investigate option to increase storage to provide greater buffering of peak demands, e.g., for snow making.	**5-20 years**
Recycled wastewater (Class A)	Explore options to provide recycled wastewater for snowmaking. (This includes the feasibility of operating a Class A plant to provide the recycled water quality likely to be required for that use).	**Next 5 years**
Third bore	Explore the option to add a third production bore to reduce the current reliance on two ageing bores.	**Next 5 years**
Capturing spring runoff	Explore feasibility of capturing snowmelt to increase alternative water supplies.	**5-20 years**
Addressing sewerage system capacity	A master plan for the Dinner Plain WWTP has been developed and will inform actions to provide sufficient capacity to treat and dispose of wastewater at Dinner Plain.	**Next 5 years**
Emergency supply	Water carting from Omeo.	**Emergency**

Conclusion

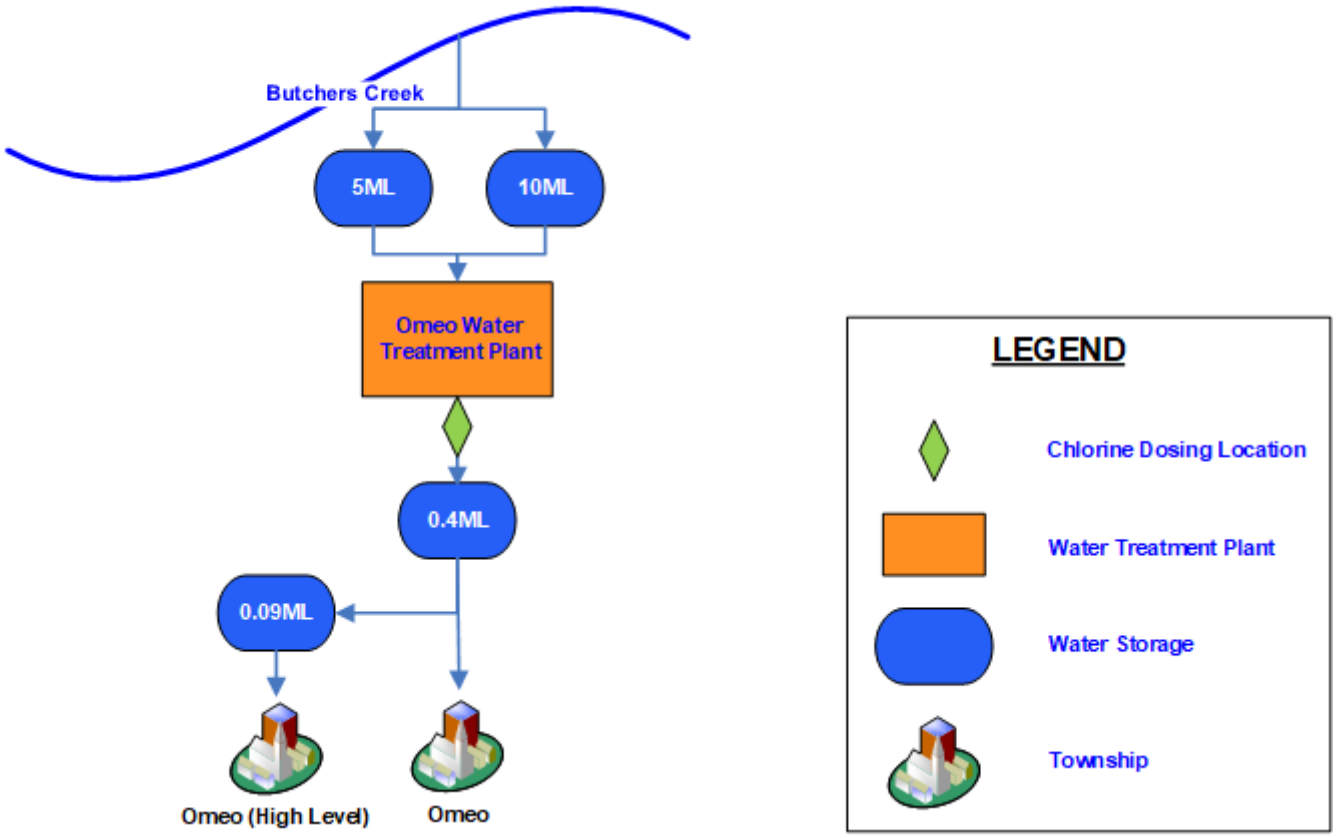
Over the 50-year planning horizon - assuming current infrastructure and current entitlements to water - both the minimum level of service and agreed levels of service are estimated to be met in 2020, but not by 2040.

By 2070, an additional supply, such as a third bore would be required, even under the lower demand projection.

Due to the aquifer type, Dinner Plain's groundwater supplies are unlikely to be affected by climate change.

Omeo System

The Omeo water supply system supplies the township of Omeo, which has a population of approximately 400 people. A schematic of the system is shown below.



Source water

Omeo's water supply is sourced from Butchers Creek, a tributary of Livingstone Creek. Raw water is piped to two storages: a 5 ML lined and covered storage, and a 10 ML covered storage.

Water treatment

Raw water is treated at the Omeo WTP and then transferred to a 400 kL clear water storage, prior to distribution to the Omeo township.

Wastewater treatment

The Omeo WWTP treats Omeo's wastewater via lagoon treatment before being held in the winter storage lagoon for pasture irrigation.

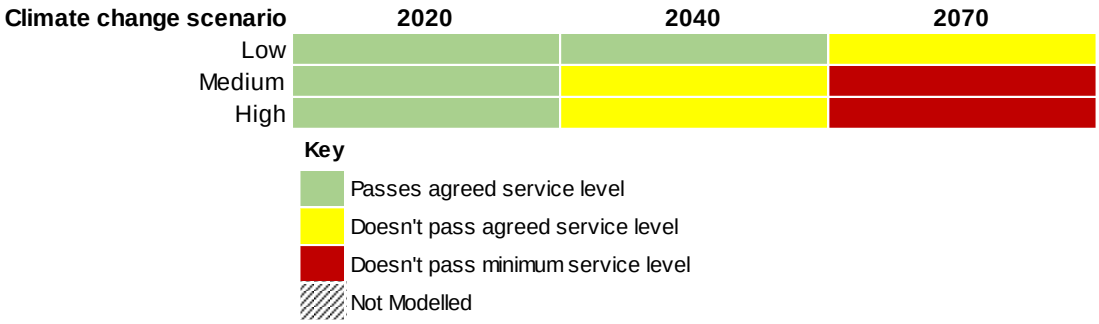
Registered Aboriginal Party

Traditional Owners have not been formally recognised for this area.

Our challenge

What is the scale of the problem?

A summary of the outlook for the Omeo water supply system is shown below.



EGW's annual bulk entitlement is estimated to be adequate to meet projected demands for Omeo over the 50-year planning horizon. At higher demands closer to 2070, the entitlement is being neared.

Action is required before 2040, to ensure the security of the water supply for Omeo. This is due to the potential for insufficient water being available in Butcher's Creek during extended low flow periods in summer/autumn.

The Omeo WWTP and winter storage capacity are modelled as being under capacity now, with this getting more severe over time without action. Action is required to ensure we can continue to provide sewerage services to Omeo without negatively impacting the environment.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Omeo water supply system describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

Option	Description	Timeframe
Streamflow monitoring and modelling improvements	Streamflow monitoring and EGW's diversion monitoring at Butchers Creek should continue to allow the estimate of streamflow at the Omeo offtake to be improved in future UWSs. It would be helpful for future analyses if the continuity of diversion data recorded at the offtake could be improved. This includes developing a climate dependent demand model to better understand peak annual demands relative to Omeo's bulk entitlement and help better represent seasonal demands. Due to the higher complexity of the Omeo water resource model relative to the other smaller supply systems, EGW will consider migrating the Omeo spreadsheet model to the Source modelling platform for the next UWS to improve model transparency and usability.	**Next 5 years**
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water.	**5-20 years and beyond**
Livingstone Creek as an alternative water source	The Livingstone Creek was used as the water supply for Omeo until 1991. Butchers Creek is a tributary of Livingstone Creek, and any catchment conditions which result in a low flow event in Butchers Creek is also likely to impact Livingstone Creek.	**Next 5 years and then ongoing**
Other alternate water sources	Explore the feasibility of the Mitta Mitta River as an alternative water source during low flow conditions in Butchers Creek. The Mitta Mitta River is a more secure supply than Butchers Creek and is likely to continue to flow even during cease-to-flow events in Butchers Creek. Historically, emergency water carting agreements have been made with the North East Catchment Management Authority (NECMA) for the supply of bulk water from the Mitta Mitta River at Hinnomunjie Bridge located approximately 20 km north of Omeo. It is understood that this supply agreement ceased in mid-2009. Also consider feasibility of sourcing water from the Tambo River and Cobungra River. Dartmouth Dam was also raised as an option during discussions with customers, however distance is likely to rule this out as a feasible option. All feasibility assessments need to consider any additional treatment (e.g., UV) requirements to ensure safe drinking water.	**Next 5 years**
Groundwater	Explore the feasibility of groundwater bores as an alternative water supply during low flows in Butchers Creek.	**Next 5 years**
Increased water storage	Considered as a preliminary option to be explored further. This will also be monitored as part of EGW master planning processes.	**Next 5 years**
Addressing sewerage system capacity	Develop a master plan for the Omeo WWTP and reuse site to identify the preferred solution(s) to address the capacities issues. This will inform our actions to provide sufficient capacity to treat and dispose of wastewater for the Omeo sewerage system.	**Next 5 years and then ongoing**
Recycled water	Considered as a preliminary option to be explored further, particularly given shortfalls in WWTP storage capacity suggesting this is an opportunity.	**Next 5 years**

Emergency	Supply from Livingstone Creek if flow available, or cart water from Mitta Mitta River (pending approval from NECMA).	**Emergency**

Conclusion

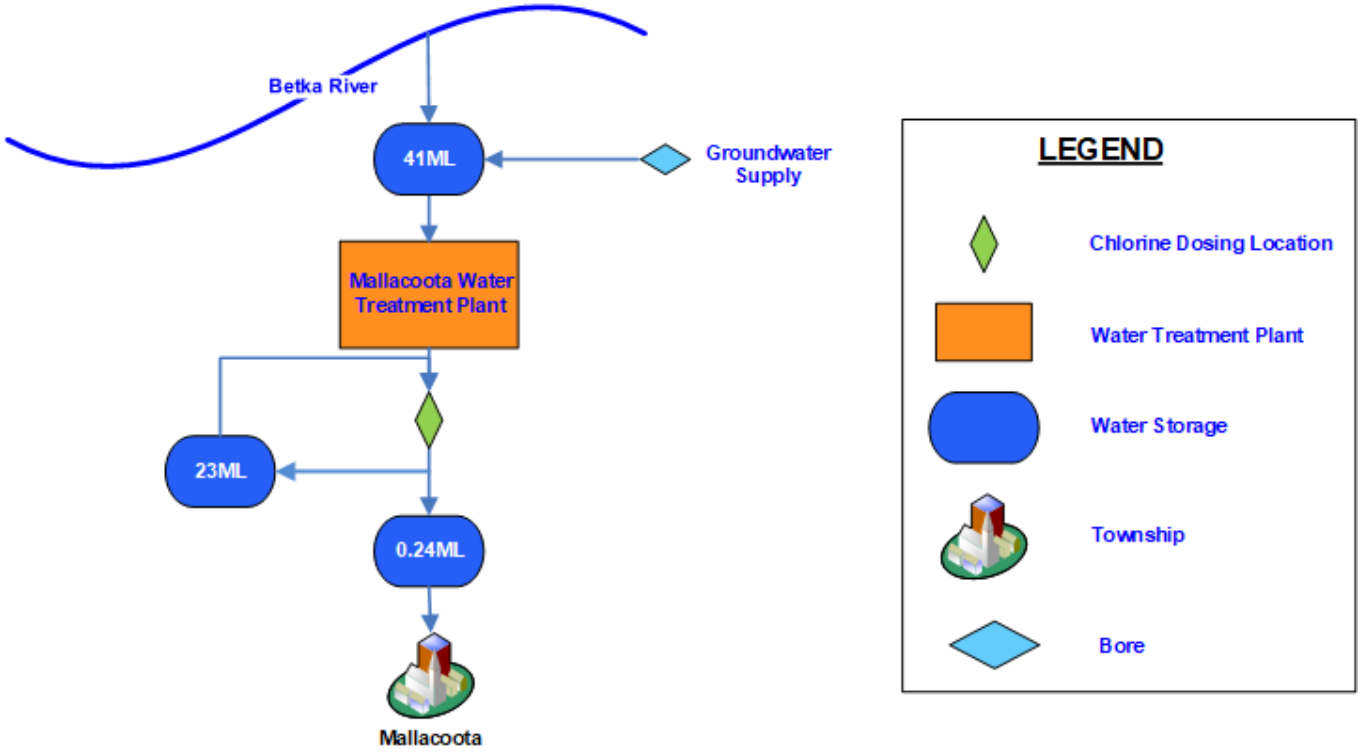
Over the 50-year planning horizon - assuming current infrastructure and current entitlements to water – action is required to ensure the minimum level of service and agreed levels of service can be met.

By 2040, EGW’s current agreed levels of service would no longer be met under the medium and high climate change scenarios. By 2070, EGW’s minimum level of service would no longer be met under the medium and high climate change scenarios.

The limiting factor on supply is insufficient water availability during extended summer/autumn low flow periods, either from Butchers Creek or from the off-stream storage.

Mallacoota System

The Mallacoota water supply system supplies the township of Mallacoota, which has a population of approximately 1,100 people. A schematic of the system is shown below.



Source water

Water is pumped from the Betka River, via a seven-kilometre pipeline into a 41 ML raw water storage basin. During times of low river flow or poor water quality after heavy rain, groundwater is available.

Water treatment

The raw water is treated at the Mallacoota WTP. The treated water is then transferred to a 240 kL clear water tank, before it is supplied to the township of Mallacoota. There is also a 23 ML clear water basin which holds additional treated water that is available for use as required.

Wastewater treatment

Wastewater from Mallacoota is treated in the Mallacoota WWTP and used on a nearby tree lot and golf course.

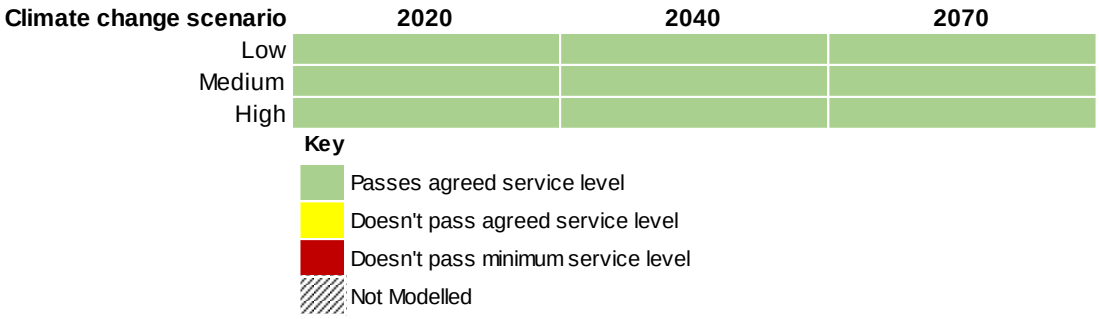
Registered Aboriginal Party

Traditional Owners have not been formally recognised for this area.

Our challenge

What is the scale of the problem?

A summary of the outlook for the Mallacoota water supply system is shown below.



EGW's annual bulk entitlement and groundwater licence are estimated to be adequate to meet projected demands for Mallacoota over the 50-year planning horizon. While no capacity issues are identified for the water supply system we need to continue to seek improvements to water supply security into the future.

The Mallacoota reuse site is modelled as being under capacity by 2070, with action required to ensure we can provide sewerage services to Mallacoota without negatively impacting the environment.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Mallacoota water supply system describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

Option	Description	Timeframe
Modelling improvements	Due to the higher complexity of the Mallacoota water resource model relative to the other smaller supply systems, EGW will consider migrating the Mallacoota spreadsheet model to the Source modelling platform for the next UWS to improve model transparency and usability.	**Next 5 years**
Groundwater	Consider if groundwater should be the primary water source for the Mallacoota water supply system, given reliance on this supply, as opposed to the Betka River in most years. Groundwater could be used in the future with the possibility of reducing reliance on the Betka River.	**Next 5 years**
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water or desalination.	**5-20 years and beyond**
Addressing sewerage system capacity	Develop a master plan for the Mallacoota WWTP and reuse site to identify the preferred solution(s) to address the capacities issues at the reuse site. This will inform our actions to provide sufficient capacity to dispose of wastewater for the Mallacoota sewerage system.	**Next 5 years and then ongoing**
Emergency	Generators, emergency fuel supplies, additional licenced bores between the Betka River offtake and the Mallacoota WTP and spare bore pumps are all measures in place to secure the water supply source in emergencies.	**Emergency**

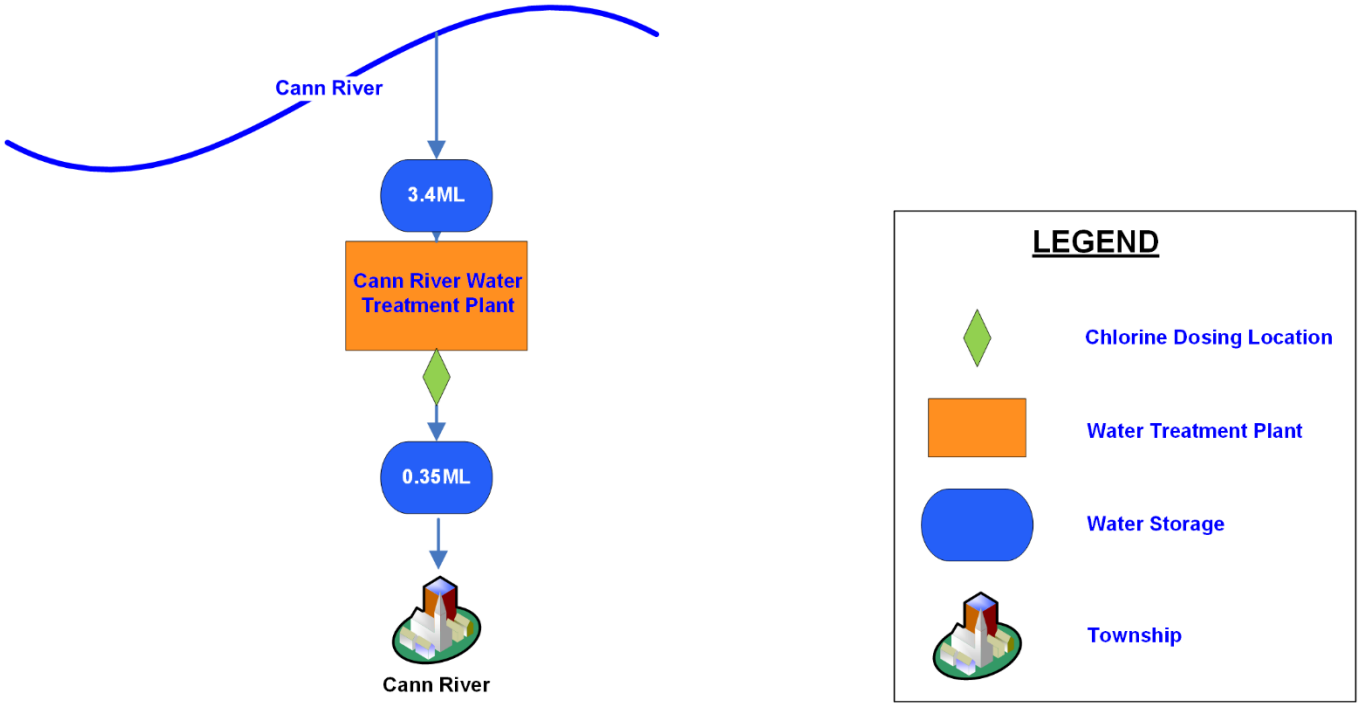
Conclusion

Over the 50-year planning horizon - assuming current infrastructure and current entitlements to water - both the minimum level of service and agreed levels of service are estimated to continue to be met.

Due to the depth of the Mallacoota bores (greater than 80 m), these are unlikely to be affected by climate change.

Cann River System

The Cann River water supply system supplies the township of Cann River, which has a population of approximately 200 people. A schematic of the system is shown below.



Source water

The primary water supply for the town of Cann River comes from the Cann River. Water is pumped from the Cann River via a 1.2km rising main to the 3.4ML raw water basin at the Cann River WTP.

Water treatment

Once this water has been treated via the WTP, it is transferred to a 350 kL clear water storage before being delivered to customers via gravity.

Wastewater treatment

Cann River's wastewater is treated at the Cann River WWTP before being reused to irrigate pasture.

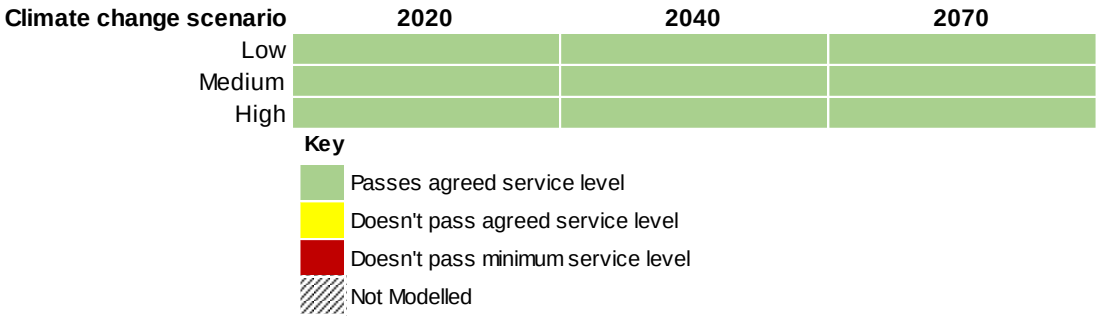
Registered Aboriginal Party

Traditional Owners have not been formally recognised for this area.

Our challenge

What is the scale of the problem?

A summary of the outlook for the Cann River water supply system is shown below.



EGW's annual bulk entitlement is estimated to be adequate to meet projected demands for Cann River over the 50-year planning horizon. While no capacity issues are identified for the water supply system we need to continue to seek improvements to water supply security into the future.

Some large sewers in Cann River and the Cann River reuse site are modelled as being under capacity now, with this getting more severe over time without action. Action is required to ensure we can continue to provide sewerage services to Cann River without negatively impacting the environment.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Cann River water supply system describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

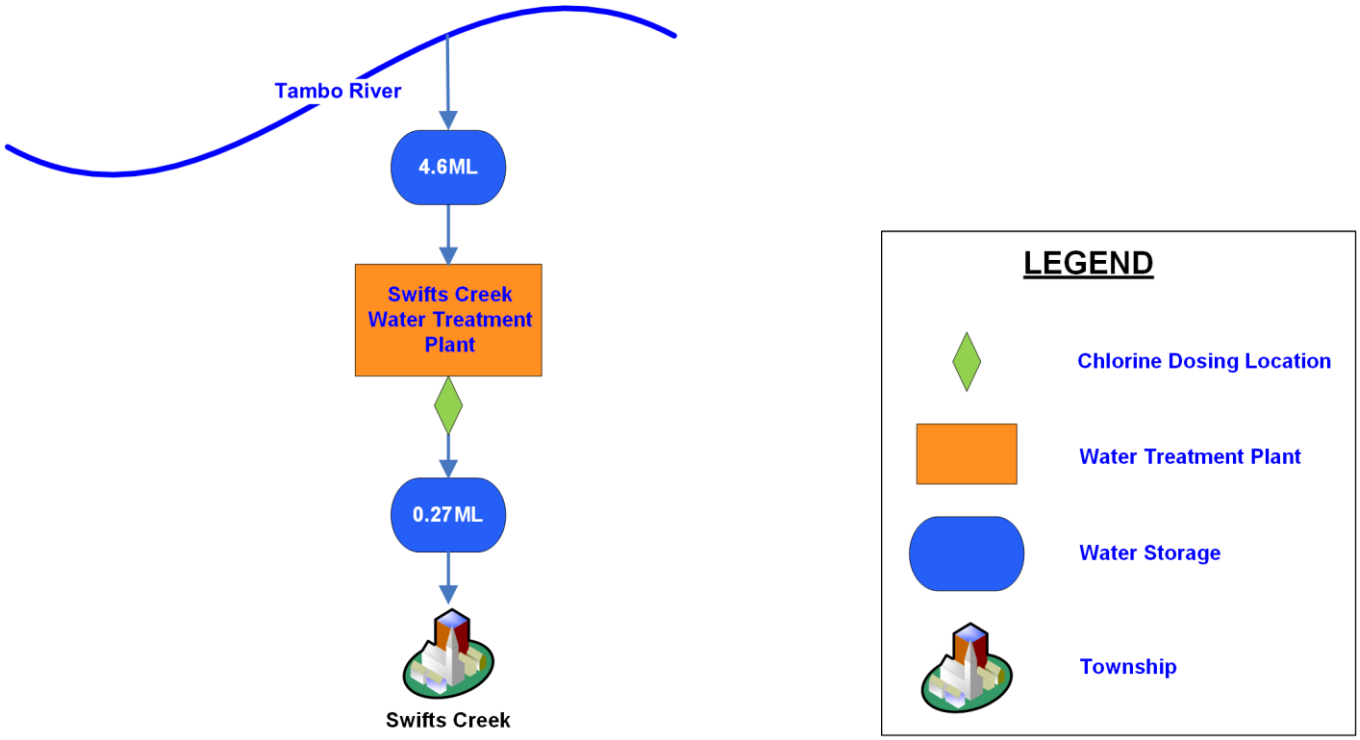
Option	Description	Timeframe
Emergency options exploration	Investigate alternative supply options to potentially remove the need to cart water from Bemm River in the event of an outage. This was investigated during the 2019/20 bushfires when access to the Cann River was cut-off, and needs to be explored further. As part of this investigation, consider any additional treatment (e.g., UV) requirements to ensure safe drinking water.	**Next 5 years**
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water or desalination.	**5-20 years and beyond**
Addressing sewerage system capacity	Develop a master plan for the Cann River sewerage network, and Cann River WWTP and reuse site to identify the preferred solution(s) to address the capacities issues in the sewerage network and at the reuse site. This will inform our actions to provide sufficient capacity to transfer and dispose of wastewater for the Cann River sewerage system.	**Next 5 years and then ongoing**
Emergency	Cart water from Bemm River.	**Emergency**

Conclusion

Over the 50-year planning horizon - assuming current infrastructure and current entitlements to water - both the minimum level of service and agreed levels of service are estimated to continue to be met.

Swifts Creek System

The Swifts Creek water supply system supplies the township of Swifts Creek, which has a population of approximately 280 people. A schematic of the system is shown below.



Source water

The primary water source for Swifts Creek comes from surface waters diverted from the Tambo River to a 4.6 ML raw water basin.

Water treatment

The raw water is treated at the Swifts Creek WTP, with treated water being stored in a 270 kL tank. This treated water is then supplied to the township of Swifts Creek.

Wastewater treatment

EGW does not provide sewerage services to Swifts Creek.

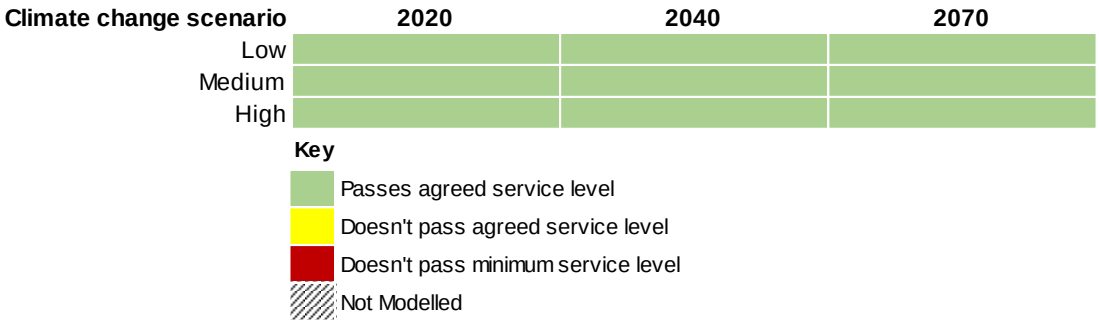
Registered Aboriginal Party

GLaWAC is the RAP for the Gunaikurnai, the Traditional Owners of our Country, as determined by the Victorian Aboriginal Heritage Council under the Aboriginal Heritage Act, 2006.

Our challenge

What is the scale of the problem?

A summary of the outlook for the Swifts Creek water supply system is shown below.



EGW's annual bulk entitlement is estimated to be adequate to meet projected demands for the Swifts Creek water supply system over the 50-year planning horizon. While no capacity issues are identified for the water supply system we need to continue to seek improvements to water supply security into the future.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Swifts Creek water supply system describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

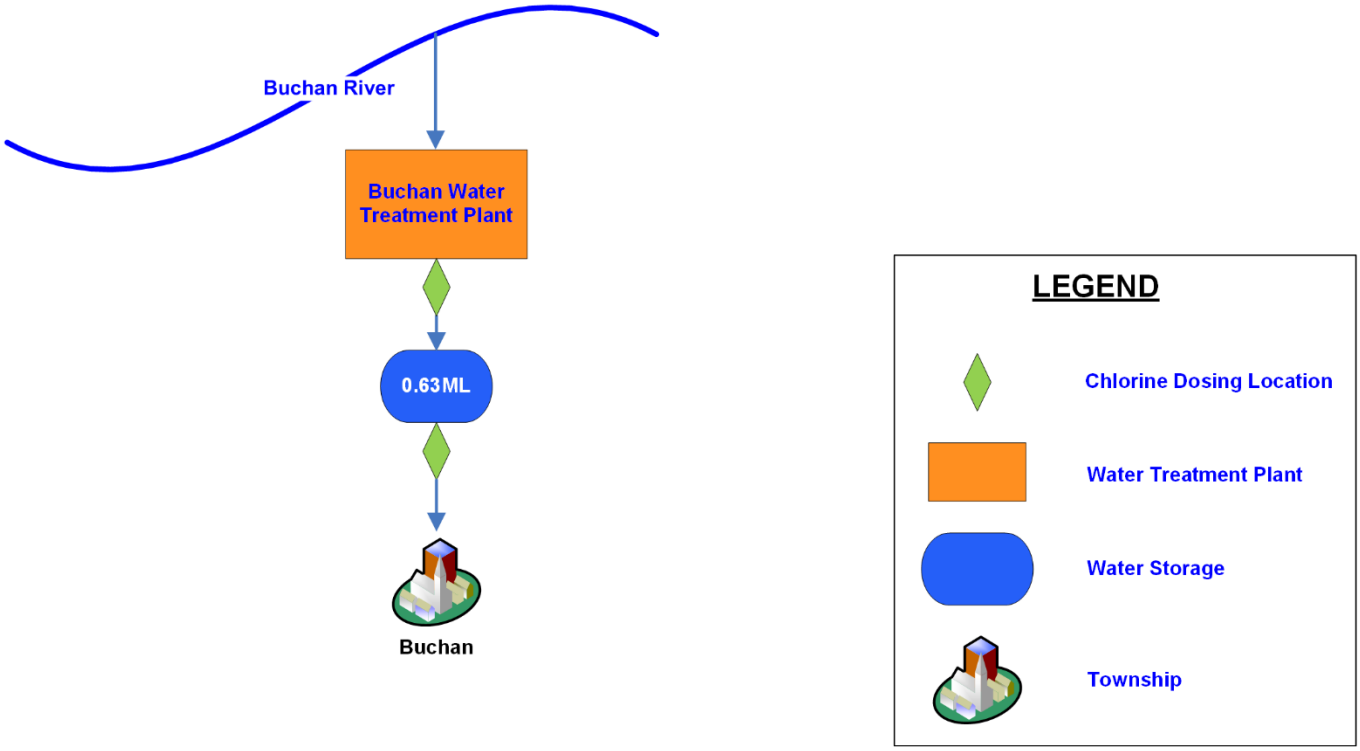
Option	Description	Timeframe
Improved historical streamflow data	Request that recorded streamflow data for the Tambo River at Swifts Creek (site 223202) from 8 March 1977 to 13 October 1979 is investigated, as it appears to have been significantly shifted upwards over this period, in a manner that was inconsistent with the observations at upstream and downstream gauges.	**Next 5 years**
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water.	**5-20 years and beyond**
Emergency options exploration	Given the geography of the land surrounding Swifts Creek, it is unlikely that groundwater will be a viable water source during a drought, however for completeness this will be explored. If found to be unsuitable, then water carting may be the best cost option during transient drought events. If this is the case, explore multiple water carting sources, such as Omeo or Ensay to provide options in the case of an emergency.	**Next 5 years**
Emergency	Cart water from Omeo.	**Emergency**

Conclusion

Current water entitlements and infrastructure are predicted to meet the minimum level of service and agreed levels of service over the 50-year planning horizon.

Buchan River System

The Buchan River water supply system supplies the township of Buchan, which has a population of approximately 240 people. A schematic of the system is shown below.



Source water

Buchan's water is sourced from the Buchan River, a tributary of the Murrindal River.

Water treatment

Raw water is pumped from the Buchan River to the Buchan WTP, and stored in interconnected balancing tanks before being gravity fed to the town's reticulation system.

Wastewater treatment

EGW does not provide sewerage services to Buchan.

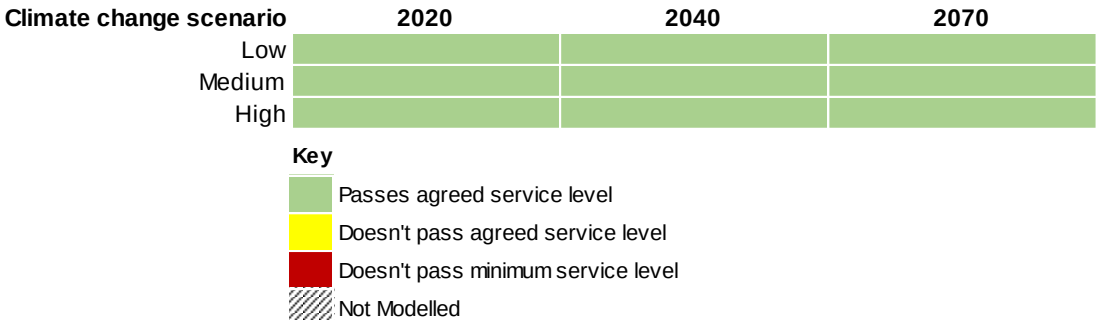
Registered Aboriginal Party

GLaWAC is the RAP for the Gunaikurnai, the Traditional Owners of our Country, as determined by the Victorian Aboriginal Heritage Council under the Aboriginal Heritage Act, 2006.

Our challenge

What is the scale of the problem?

A summary of the outlook for the Buchan River water supply system is shown below.



EGW's annual bulk entitlement is estimated to be adequate to meet projected demands for the Buchan River System over the 50-year planning horizon. While no capacity issues are identified for the water supply system we need to continue to seek improvements to water supply security into the future.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Buchan water supply system describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

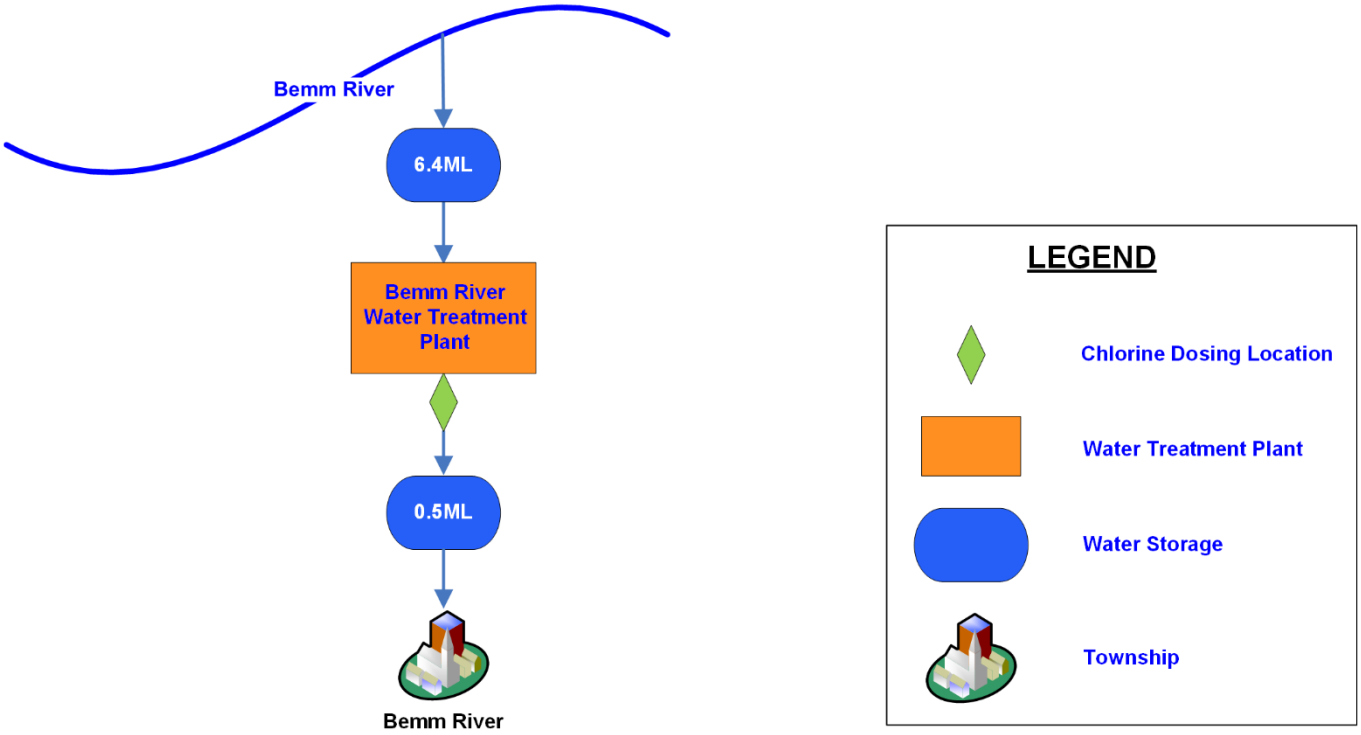
Option	Description	Timeframe
Emergency options exploration	Investigate alternative supply options, to potentially remove the need to cart water from Nowa Nowa in the event of an outage. As part of this investigation, consider any additional treatment (e.g., UV) requirements to ensure safe drinking water.	**Next 5 years**
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water.	**5-20 years and beyond**
Emergency	Cart water from Nowa Nowa which is a part of the Mitchell Water Supply System. There is also an option to cart water from Orbost.	**Emergency**

Conclusion

Over the 50-year planning horizon - assuming current infrastructure and current entitlements to water - both the minimum level of service and agreed levels of service are estimated to continue to be met. This assumes water carting from the Mitchell water supply system occurs during cease to flow events.

Bemm River System

The Bemm River water supply system supplies the township of Bemm River, which has a population of approximately 60 people. A schematic of the system is shown below.



Source water

Bemm River's water supply is sourced from the Bemm River, and is transferred to a 6.4 ML raw water basin.

Water treatment

Water is transferred from the raw water basin to the Bemm River WTP, where it is treated and then stored in a 0.5 ML clear water tank, which supplies the town via gravity.

Wastewater treatment

Wastewater from Bemm River is transferred to the WWTP located on a 10-hectare rural site, 1.5 km north of Bemm River and supplies that site with recycled water to a standard suitable for subsurface irrigation.

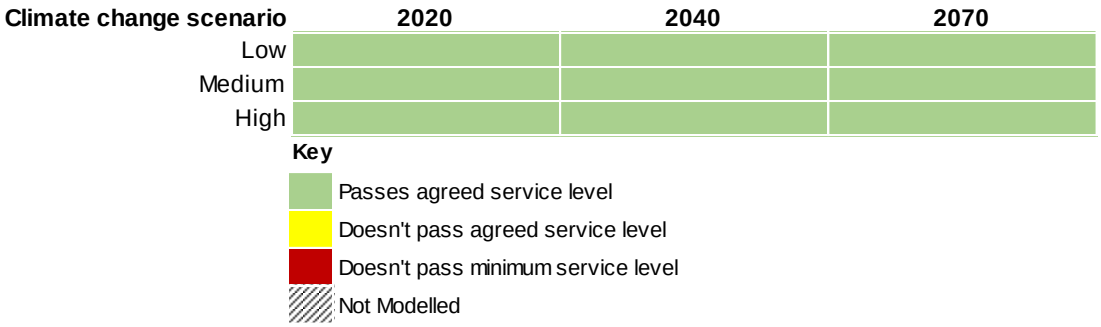
Registered Aboriginal Party

Traditional Owners have not been formally recognised for this area.

Our challenge

What is the scale of the problem?

A summary of the outlook for the Bemm River water supply system is shown below.



EGW's annual bulk entitlement is estimated to be adequate to meet projected demands for Bemm River over the 50-year planning horizon.

The Bemm River treated wastewater storage capacity is modelled as being under capacity now, with this getting more severe over time without action. Action is required to ensure we can continue to provide sewerage services to Bemm River without negatively impacting the environment.

Our response

What do we propose to do?

Our adaptive plan to respond to the challenge faced by the Bemm River water supply system describes the short term, long term, emergency water supply, and drought actions to be undertaken. These are shown in the table below.

Option	Description	Timeframe
Emergency options exploration	Investigate alternative supply options to potentially remove the need to cart water from Orbost or Cann River in the event of an outage. As part of this investigation, consider any additional treatment (e.g., UV) requirements to ensure safe drinking water.	**Next 5 years**
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water or desalination.	**5-20 years and beyond**
Addressing sewerage system capacity	A master plan for the Bemm River WWTP and reuse site has been developed and will inform actions to provide sufficient capacity to treat and dispose of wastewater at Bemm River.	**Next 5 years and then ongoing**
Emergency	Cart water from Orbost or Cann River water supply systems.	**Emergency**

Conclusion

Over the 50-year planning horizon - assuming current infrastructure and current entitlements to water - both the minimum level of service and agreed levels of service are estimated to continue to be met.

14. Conclusion

Our UWS responds to the challenges that we face to achieve a secure water future for our region. Our adaptive pathway seeks to balance all the needs for water in our region by finding smarter ways to use the water we already have, and transitioning from climate dependent to climate independent sources of water.

We need to continue to invest in order to secure future water supplies in a way that respects the environment and cultural values of the region - but we need to invest in a way that maintains affordability for our customers.

Our UWS sets out a clear plan of action for the next five years, and our community's water vision for the next 50 years. These actions, together with the broader suite of strategic initiatives and investments we need to make across our business, will ultimately be reflected in our 2023 Price Submission.

Our focus in the short term is to secure supply in the Mitchell water supply system, and in the medium-term secure supply in the Orbost, Omeo, and Dinner Plain water supply systems. All other systems are secure for the 50-year horizon of this strategy. Appendix A provides a summary of the actions from this UWS.

Appendix A

List of actions

A summary of all actions from each of the systems is shown below.

Strategic actions

Option	Description	Timeframe
All systems		
Customer Education	Work with customers and community groups to build understanding of water conservation practices, the value of water and what individuals, households and industry can do to reduce demand for drinking water.	**Next 5 years and then ongoing**
IWM Initiatives	Where feasible, continue to pursue small and large-scale uses of recycled water, or other water sources such as stormwater and rainwater tanks instead of drinking water, thereby reducing demand for drinking water.	**Next 5 years and then ongoing**
Less climate dependent water sources	Explore opportunities to move towards less climate dependent water sources for future water supply upgrades, while also considering the potential opportunities and risks of sea level rise and carbon emissions because of climate change. This may include bore water or desalination.	**5-20 years and beyond**

System specific actions

Option	Description	Timeframe
Mitchell System		
Maximise Mitchell River supply through additional storage at Woodglen	Increase availability of Mitchell River raw water supply through construction of additional off-stream raw water storage at EGW's existing Woodglen site. This is the key outcome of the UWS.	**Next 5 years**
Additional Bulk Entitlement required	If the Mitchell River continues to be the sole water source for the water supply system, explore options to secure additional entitlement volume (to be held as bulk entitlement)	**20-50 years**
Addressing sewerage system capacity	Master plans have been developed, are in progress, or are scheduled within the next 5 years for the Bairnsdale, Lindenow, Paynesville and Metung sewerage systems to identify the preferred solution(s) to address the capacities issues. This will inform our actions to provide sufficient capacity to transfer, treat and dispose of wastewater in the Mitchell region.	**Next 5 years and then ongoing**
Addressing poor water quality	In the event of water quality issues (i.e. abnormally high turbidity following a bushfire that exceeds the capacity of the WTP) consider the following response options: • Review selective harvesting based on streamflow, turbidity and forecast additional rainfall • Use of lamella clarifiers to pre-treat river water to remove sediment to a suitable level for the WTP to handle • Treatment of water with poly-aluminium chloride (system already installed) • Water restrictions to reduce demand	**Emergency**
Emergency supply	Due to the volume of water required to supply customers in the Mitchell water supply system, options that are used for other systems such as water carting are not feasible. Instead, we ensure we have system redundancy using sprinklers to protect assets during fires, generators for back-up electricity supplies, and in-system storage to reduce the number of customers affected by individual outages. These are only a few examples; we also closely monitor weather forecasts, streamflow and water usage to support decision making around the use of water restrictions if required.	**Emergency**
Orbost System		
Streamflow modelling	Streamflow data collection needs to be improved to better understand river flows in the Brodribb River at the EGW offtake.	**The next 5 years**
Planning for WTP Capacity Increase	Develop a master plan for the Orbost WTP to ensure sufficient off-stream storage, WTP capacity and treated water storage to meet customer demands up to and beyond 2040, when there is projected to be a possible treatment capacity shortfall. This master plan will also identify off-stream water storage requirements to allow more selective harvesting of river water so that if the river water quality if poorer, we don't need to harvest water. This was the reason for water restrictions needing to be implemented for the Orbost water supply system following the 2019-20 bushfires.	**The next 5 years**
Addressing sewerage system capacity	Develop a master plan for the Orbost sewerage network and WWTP to identify the preferred solution(s) to address the capacities issues. This will inform our actions to provide sufficient capacity to transfer and treat wastewater for the Orbost sewerage system.	**Next 5 years and then ongoing**
Options assessment	Explore potential alternative sources of water for use in water shortage/water quality events, e.g., groundwater bores, recommissioning water supply assets.	**The next 5 years**

Option	Description	Timeframe
Emergency supply	Due to the volume of water required to supply customers in the Orbost water supply system, options that are used for other systems such as water carting are less feasible. Instead, we ensure we have system redundancy using sprinklers to protect assets during fires and generators for back-up electricity supplies to reduce the number of customers affected by individual outages. These are only a few examples; we also closely monitor weather forecasts, streamflow and water usage to support decision making around the use of water restrictions if required.	**Emergency**
Dinner Plain System		
Decrease unaccounted for water	Continue to actively work to reduce the high unaccounted-for water which is due to burst mains, leaks, and faulty meters because of the alpine conditions. Measures to decrease leakage include: • Monitoring night flows • Listening for flow in meters and pipes during the summer period • Checking and fixing faulty meters • Insulating meters and pipes	**The next 5 years**
Increase Storage	Investigate option to increase storage to provide greater buffering of peak demands, e.g., for snow making.	**5-20 years**
Recycled wastewater (Class A)	Explore options to provide recycled wastewater for snowmaking. (This includes the feasibility of operating a Class A plant to provide the recycled water quality likely to be required for that use).	**Next 5 years**
Third bore	Explore the option to add a third production bore to reduce the current reliance on two ageing bores.	**Next 5 years**
Capturing spring runoff	Explore feasibility of capturing snowmelt to increase alternative water supplies.	**5-20 years**
Addressing sewerage system capacity	A master plan for the Dinner Plain WWTP has been developed and will inform actions to provide sufficient capacity to treat and dispose of wastewater at Dinner Plain.	**Next 5 years**
Emergency supply	Water carting from Omeo.	**Emergency**
Omeo System		
Streamflow monitoring and modelling improvements	Streamflow monitoring and EGW's diversion monitoring at Butchers Creek should continue to allow the estimate of streamflow at the Omeo offtake to be improved in future UWSs. It would be helpful for future analyses if the continuity of diversion data recorded at the offtake could be improved. This includes developing a climate dependent demand model to better understand peak annual demands relative to Omeo's bulk entitlement and help better represent seasonal demands. Due to the higher complexity of the Omeo water resource model relative to the other smaller supply systems, EGW will consider migrating the Omeo spreadsheet model to the Source modelling platform for the next UWS to improve model transparency and usability.	**Next 5 years**
Livingstone Creek as an alternative water source	The Livingstone Creek was used as the water supply for Omeo until 1991. Butchers Creek is a tributary of Livingstone Creek, and any catchment conditions which result in a low flow event in Butchers Creek is also likely to impact Livingstone Creek.	**Next 5 years and then ongoing**

Option	Description	Timeframe
Other alternate water sources	Explore the feasibility of the Mitta Mitta River as an alternative water source during low flow conditions in Butchers Creek. The Mitta Mitta River is a more secure supply than Butchers Creek and is likely to continue to flow even during cease-to-flow events in Butchers Creek. Historically, emergency water carting agreements have been made with the North East Catchment Management Authority (NECMA) for the supply of bulk water from the Mitta Mitta River at Hinnomunjie Bridge located approximately 20 km north of Omeo. It is understood that this supply agreement ceased in mid-2009. Also consider feasibility of sourcing water from the Tambo River and Cobungra River. Dartmouth Dam was also raised as an option during discussions with customers, however distance is likely to rule this out as a feasible option. All feasibility assessments need to consider any additional treatment (e.g., UV) requirements to ensure safe drinking water.	**Next 5 years**
Groundwater	Explore the feasibility of groundwater bores as an alternative water supply during low flows in Butchers Creek.	**Next 5 years**
Increased water storage	Considered as a preliminary option to be explored further. This will also be monitored as part of EGW master planning processes.	**Next 5 years**
Addressing sewerage system capacity	Develop a master plan for the Omeo WWTP and reuse site to identify the preferred solution(s) to address the capacities issues. This will inform our actions to provide sufficient capacity to treat and dispose of wastewater for the Omeo sewerage system.	**Next 5 years and then ongoing**
Recycled water	Considered as a preliminary option to be explored further, particularly given shortfalls in WWTP storage capacity suggesting this is an opportunity.	**Next 5 years**
Emergency	Supply from Livingstone Creek if flow available, or cart water from Mitta Mitta River (pending approval from NECMA).	**Emergency**
Mallacoota System		
Modelling improvements	Due to the higher complexity of the Mallacoota water resource model relative to the other smaller supply systems, EGW will consider migrating the Mallacoota spreadsheet model to the Source modelling platform for the next UWS to improve model transparency and usability.	**Next 5 years**
Groundwater	Consider if groundwater should be the primary water source for the Mallacoota water supply system, given reliance on this supply, as opposed to the Betka River in most years. Groundwater could be used in the future with the possibility of reducing reliance on the Betka River.	**Next 5 years**
Addressing sewerage system capacity	Develop a master plan for the Mallacoota WWTP and reuse site to identify the preferred solution(s) to address the capacities issues at the reuse site. This will inform our actions to provide sufficient capacity to dispose of wastewater for the Mallacoota sewerage system.	**Next 5 years and then ongoing**
Emergency	Generators, emergency fuel supplies, additional licenced bores between the Betka River offtake and the Mallacoota WTP and spare bore pumps are all measures in place to secure the water supply source in emergencies.	**Emergency**
Cann River System		
Emergency options exploration	Investigate alternative supply options to potentially remove the need to cart water from Bemm River in the event of an outage. This was investigated during the 2019/20 bushfires when access to the Cann River was cut-off, and needs to be explored further. As part of this investigation, consider any additional treatment (e.g., UV) requirements to ensure safe drinking water.	**Next 5 years**

Option	Description	Timeframe
Addressing sewerage system capacity	Develop a master plan for the Cann River sewerage network, and Cann River WWTP and reuse site to identify the preferred solution(s) to address the capacities issues in the sewerage network and at the reuse site. This will inform our actions to provide sufficient capacity to transfer and dispose of wastewater for the Cann River sewerage system.	**Next 5 years and then ongoing**
Emergency	Cart water from Bemm River.	**Emergency**
Swifts River System		
Improved historical streamflow data	Request that recorded streamflow data for the Tambo River at Swifts Creek (site 223202) from 8 March 1977 to 13 October 1979 is investigated, as it appears to have been significantly shifted upwards over this period, in a manner that was inconsistent with the observations at upstream and downstream gauges.	**Next 5 years**
Emergency options exploration	Given the geography of the land surrounding Swifts Creek, it is unlikely that groundwater will be a viable water source during a drought, however for completeness this will be explored. If found to be unsuitable, then water carting may be the best cost option during transient drought events. If this is the case, explore multiple water carting sources, such as Omeo or Ensay to provide options in the case of an emergency.	**Next 5 years**
Emergency	Cart water from Omeo.	**Emergency**
Buchan River System		
Emergency options exploration	Investigate alternative supply options, to potentially remove the need to cart water from Nowa Nowa in the event of an outage. As part of this investigation, consider any additional treatment (e.g., UV) requirements to ensure safe drinking water.	**Next 5 years**
Emergency	Cart water from Nowa Nowa which is a part of the Mitchell Water Supply System. There is also an option to cart water from Orbost.	**Emergency**
Bemm River System		
Emergency options exploration	Investigate alternative supply options to potentially remove the need to cart water from Orbost or Cann River in the event of an outage. As part of this investigation, consider any additional treatment (e.g., UV) requirements to ensure safe drinking water.	**Next 5 years**
Addressing sewerage system capacity	A master plan for the Bemm River WWTP and reuse site has been developed and will inform actions to provide sufficient capacity to treat and dispose of wastewater at Bemm River.	**Next 5 years and then ongoing**
Emergency	Cart water from Orbost or Cann River water supply systems.	**Emergency**

Appendix B

Drought preparedness plan

Overview

The drought preparedness plan (DPP) has been developed to ensure that EGW will always be able to meet critical human needs for water, even during extreme events that lead to water shortages.

It outlines actions that are undertaken to ensure that communities are prepared for the eventuality of drought. The DPP describes our level of service commitment, the basis for water restrictions and water restriction By-Laws. It also includes a drought response Plan (DRP), which details the specific steps we will take when a response to dry conditions is required.

Levels of service

EGW has agreed levels of service for the reliability of our water supply. It is our commitment to our customers and has two parts.

1. **Frequency of Level 1 and Level 2 restrictions** – 1 in 10 years.
2. **Frequency of Level 3 and Level 4 restrictions** – 1 in 15 years.

Water Restriction by-law

Urban water restrictions are an important tool EGW (and all Victorian water corporations) can use to save water during drought, water shortage or emergency supply events. The urban water restrictions limit how and when drinking water can be used outdoors for activities.

There are four stages of urban water restrictions, ranging from stage one (least severe) to stage four (most severe). They apply to both households and businesses, and there are penalties if restriction rules are not followed.

The Water Restriction by-law is what gives effect to Victoria's urban water restrictions. This by-law is currently being reviewed. The proposed Model Water Restriction by-law is the same as the existing Water Restriction by-law, with two minor additions:

1. Encourage the use of alternative water sources (such as recycled water) for dust suppression under all stages of restriction where it is practical, safe, and reasonable to do so. The existing by-law only encourages the use of alternative sources under stage 4 restrictions.
2. Require residential and commercial pool and spa owners under stage 4 restrictions to submit a Water Use Plan if topping them up with anything other than a bucket or watering can. The existing by-law only allows top ups using a bucket or watering can under stage 4 restrictions. The change will encourage pool and spa owners to consider water efficient practices, such as using a cover, to help conserve water during restrictions.

Consideration of exemptions

EGW recognises that the health of key public assets – such as swimming pools, sports fields, and public open space – is often critical to the health, wellbeing, and liveability of communities during drought periods. In the lead up to introducing water restrictions we work with local government to identify priority open space assets for which we will seek to ensure adequate water supply under any conditions, as occurred during the 2017-2019 drought. This may be through exemptions to water restrictions (with an appropriate Water Use Plan), or provision of an alternative water source such as recycled water or stormwater.

Exemptions for the establishment of warm season grasses may also be granted.

Permanent water saving rules

EGW has a set of water saving rules which are applied every day, regardless of rainfall, weather, and water storage volumes. The permanent water saving rules do not restrict water use but do encourage the efficient use of water. They are simple, common-sense measures that ensure that we are continually conserving water now and into the future. The rules are:

Trigger nozzle

- Use a leak-free hand-held hose fitted with a trigger nozzle at any time.

Watering systems

- Watering systems can be used on residential or commercial gardens and lawns any day between 6 pm and 10 am.
- A bucket or watering can may be used at any time.

Public spaces

- Public gardens, lawns and playing surfaces can be watered at any time with a hand-held hose, bucket or watering can.
- A watering system fitted with a rain or soil moisture sensor can be used any day between 6 pm and 10 am.

Water features

- Only use fountains or water features that recirculate water.

Hard surfaces

- Use a high-pressure hose, hand-held hose, or bucket to water hard surfaces during construction or renovations or to remove a hazard.
- Hard surfaces can be cleaned once every 3 months if staining develops.

Triggers for water restrictions

EGW may need to introduce water restrictions for a range of reasons, which are outlined below.

Water quality

Where the water quality criteria are not satisfied, as determined by the WTP operator, EGW will assess the impact of water quality on supply (i.e., quantity and duration) to determine the appropriate response.

For example, the WTP has the capacity to manage blue-green algae, although it can reduce the output rate. In this case the daily demand may not be met, and emergency measures may be required.

Daily demand

Where there is insufficient supply to meet short-term demand, perhaps due to infrastructure constraints, or extended periods of high demand. This may also be resolved operationally through implementing emergency responses.

Storage levels

Systems that rely on water storages have set triggers based on maintaining water reserves to preserve supply.

Supply

In systems where water from a river system is the source of supply, river flow rates are assessed on a regular basis and compared with licence conditions.

Stages of water restrictions

There are four stages of water restrictions under the by-law, in addition to the permanent water saving rules. The stages increase in severity and are designed to be implemented as drought climate conditions continue and water storage levels decline. Water restrictions do not restrict the use of water for indoor purposes such as drinking, washing, cleaning or sanitation.

A full list of water restrictions can be found on the EGW website – www.egwater.vic.gov.au/water-restrictions

Stage 1 water restriction rules (Alert)

The main Stage 1 water restriction rules include:

- Gardens and lawns may be watered with a hand-held hose, bucket or watering can at any time and sprinklers and watering systems may be used between 6 pm and 10 pm and between 6 am and 10 am and on alternate days
- Public gardens or lawns can be watered in accordance with an approved Water Use Plan

Stage 2 water restriction rules (Save)

Stage 2 water restrictions rules include, but are not limited to the following:

- Lawns cannot be watered at any time
- Gardens can be watered with a hand-held hose or watering can at any time; watering systems may be used between 6 pm and 8 pm and between 6 am and 8 am and on alternate days
- Public gardens or lawns can be watered where an approved Water Use Plan is in place

Stage 3 water restriction rules (Just enough)

A summary of the key rules under Stage 3 water restrictions include:

- Lawns cannot be watered at any time
- Gardens can only be watered with a handheld hose or watering can between 6 am and 8 am on alternate days (watering systems are not permitted)
- Public gardens or lawns can be watered where an approved Water Use Plan is in place

Stage 4 water restriction rules (Critical)

Under Stage 4 water restrictions lawns and gardens cannot be watered at any time.

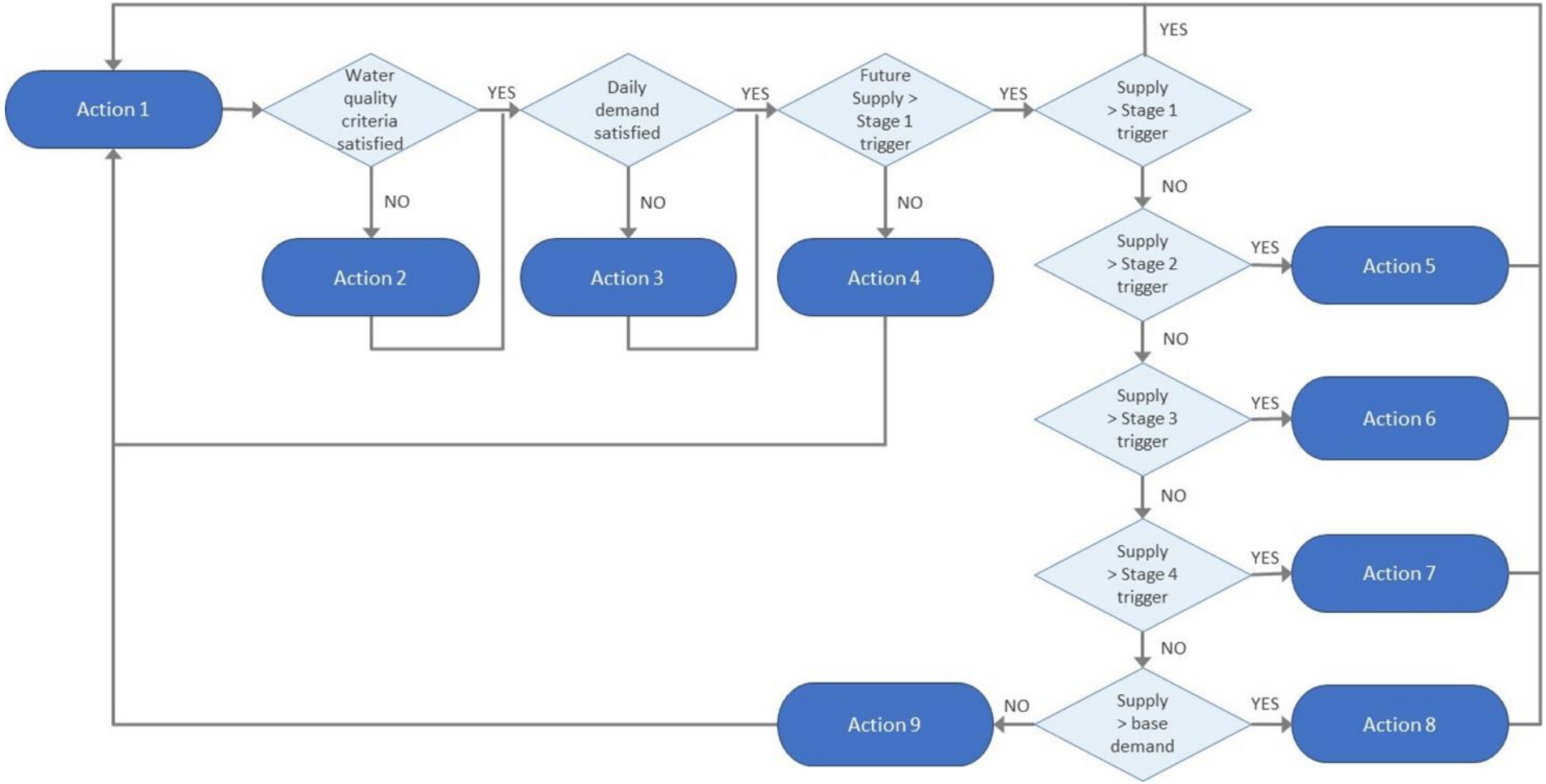
Drought Response Plans

A DRP has been developed by EGW to describe the actions we will take in response to drought or any other water shortage for each system. This plan meets the requirements of, and should be read in conjunction with, EGW's Statement of Obligations and the Water Restriction By-Law No. 190.

Drought response measures may include water restrictions, specific awareness campaigns, carting of water to smaller water systems, and the use of additional water sources such as groundwater. For each water supply system, there is a specific contingency plan tailored to suit the different system size and characteristics.

Drought response process

The process for determining water restrictions in each system is summarised below.



Actions and triggers for individual systems are outlined below.

Triggers for action

The response for each action shown in the diagram above is described below. Actions will be reviewed by EGW to ensure that any decision satisfies corporate obligations, commitments, and responsibilities.

Action	Trigger	Response
1	Always	• Apply permanent water saving rules • Monitor available water and forecast supply for comparison against trigger levels • Promote water saving initiatives such as Target Your Water Use • Monitor source water quality • Maintain systems and infrastructure
2	Water quality criteria not satisfied	• Assess impact of water quality on supply (i.e., quantity and possible duration) to determine appropriate response
3	Inability to meet daily demand from WTP	• Assess impact on meeting demand (i.e., supply, pressure, and possible duration) to determine appropriate response • Inform community of cause and expected duration of event • Consider undertaking water carting where practicable
4	Available water volume falls below unrestricted demand	• Consider need to engage with community regarding water saving initiatives
5	Available water volume falls below Stage 1 trigger	• Consider introducing Stage 1 restrictions. Consideration should be given to groundwater levels and trends, climate conditions, time of year and demand trends • Advise community of resource position and EGW's response • Engage with Councils and other open space managers on impact of restrictions to important liveability assets
6	Available water volume falls below Stage 2 trigger	• In addition to above responses, consider introducing Stage 2 restrictions
7	Available water volume falls to Stage 3 trigger	• In addition to above responses, consider introducing Stage 3 restrictions • Consider bringing forward any programmed works aimed at reducing system losses • Consider bringing forward longer-term augmentation works identified in the UWS
8	Available water volume falls to Stage 4 trigger	• In addition to above responses, consider introducing Stage 4 restrictions
9	Insufficient water available to meet Stage 4 demand	• Consider emergency measures

Restrictions are imposed to reduce demand to conserve water. Water restrictions are system specific to protect water supplies during drought or similar conditions. The triggers for action for each system are shown in the tables below.

Mitchell system

Trigger point*	Action	Time to dead storage if no rain	Time to next trigger level if no rain
Business as Usual			
Mitchell River Flow >700 ML/day at any time of year or 100 to 700 ML/day May to Aug	June and July only: drawdown Woodglen storages to turn water over for water quality purposes– ensure storages are as full as possible at other times of year	NA	NA
	Ensure maximum ASR storage (200 ML) including topping up to make up for 2.5% per year system losses as per licence conditions		
	Continue to monitor and reduce system losses including leakage		
Early Alert			
Mitchell River Flow <700 ML/day in Sept to April and no significant rain forecast	Closer monitoring of storage levels, demand, and weather forecast (short and long term)	~35 weeks	~13 weeks
	No drawing down of Woodglen storage volumes		
	No maintenance scheduled which could temporarily reduce pumping capacity, storage volumes or WTP throughflow		
Mitchell River Flow <265 ML/day in Sept to April and no significant rain forecast	Commence 'preparatory' messaging to customers	22 weeks	20 days
	Brief Board, DELWP & key stakeholders		
	Consider establishment of Incident Control Centre		
	No maintenance scheduled which could temporarily reduce pumping capacity, storage volumes or WTP throughflow		
Voluntary Restrictions			
Mitchell River Flow <100 ML/day any time of year and no significant rain forecast	Strong messaging to customers – consider voluntary restrictions depending on short- and long-term weather forecast	19 weeks	18 days
	Continue to brief Board, DELWP & key stakeholders.		
	Establish Incident Control Centre (if not previously established)		
	Prepare qualification of rights submission information		
Stage 2 Restrictions			
Mitchell River Flow < 30 ML/d at any time of year and no significant rain forecast (Trigger for no pumping)	Consider introducing Stage 2 restrictions as follows:	16.5 weeks	26 days
	• Trigger reached May to Aug: Stage 2 or no restrictions		
	• Trigger reached Jan to April or Sept to Dec: Stage 2 restrictions		
	Strong messaging to customers		
	Continue to brief Board, DELWP & key stakeholders.		
	Submit formal request to Minister for Water for Qualification of Rights.		
	Commence groundwater pumping		
Woodglen Storage Volume < 1150 ML (90 days storage on restricted demand)	Notify DELWP of imminent Stage 4 restrictions	90 days	30 days
	Strong messaging to customers of imminent Stage 4 restrictions		
Stage 4 and Qualification of Rights			
Mitchell River Storage Volume < 750 ML (60 days storage on restricted demand)	Introduce Stage 4 restrictions	60 days	60 days to dead storage
	Qualification of rights to be approved by the time Stage 4 water restrictions are in place. The aim of the qualification of rights is to continue to extract from the Mitchell River when flow is <30 ML/day to maintain 60 days storage at Stage 4 customer demand levels.		

Orbost system

Restriction level	Trigger	Days of storage for current 45.9 ML CWS (based on no treated water inflow and summer restricted demand)
Voluntary restrictions and/or heightened awareness message to community	Daily treatable capacity is likely to be between 75% to 90% of demand for at least the next 7 days	126 days to >190 days
Stage 1 or 2 restrictions	Daily treatable capacity is likely to be between 33% to 75% of demand for at least the next 7 days	58 days to 126 days
Stage 3 or 4 restrictions	Daily treatable capacity is likely to be less than 33% of demand for at least the next 7 days	29 days to 58 days

Dinner Plain system

Restriction level	Trigger
Restricted or no snow making	When bore yield is reduced to less than 75% of normal OR when demand is higher than bore yield
Voluntary restrictions and/or heightened awareness message to community	When bore yield is reduced to 75% of normal (but greater than 50%)
Stage 1 or 2 restrictions	When bore yield is reduced to less than 50% of normal OR when demand is higher than bore yield
Stage 3 or 4 restrictions	When water carting is required

Omeo system

Restriction level	Trigger	No. of days of raw water storage with no inflows and restricted demand	No. of days of clear water storage with no inflows from WTP and restricted demand
Voluntary restrictions and/or heightened awareness message to community	10 ML of raw water storage left	92 to 197 days (January)	1 to 2 days (January)
Stage 1 or 2 restrictions	8 ML of raw water storage left	88 to 187 days (January)	1 to 2 days (January)
Stage 3 or 4 restrictions	5 ML of raw water left OR reduced WTP output	30 to 65 days (January)	2 to 5 days (January)

Mallacoota system

Restriction level	Trigger	No. of days of total raw water and clear water storage with no inflows and restricted demand
Stage 1 or 2 restrictions	Less than 30 ML of combined raw water and clear water storage volume	78 to 202 days (January demand)
Stage 3 or 4 restrictions	Less than 15 ML of combined raw water and clear water storage volume	19 to 49 days (January demand)

Cann River system

Restriction level	Trigger	No. of days of raw water storage with no inflows and restricted demand
Stage 1 or 2 restrictions	River yield less than demand	Variable
Stage 3 or 4 restrictions	2 ML of raw water left OR reduced WTP output	18 to 37 days (January)

Swifts Creek system

Restriction level	Trigger	No. of days of raw water storage with no inflows and restricted demand	No. of days of clear water storage with no inflows from WTP and restricted demand
Stage 1 or 2 restrictions	3.5 ML of raw water storage left	83 to 175 days (January)	1 to 3 days (January)
Stage 3 or 4 restrictions	2 ML of raw water left OR reduced WTP output	16 to 34 days (January)	4 to 9 days (January)

Buchan River system

Restriction level	Trigger
Voluntary restrictions and/or heightened awareness message to community	Commencement of water carting
Stage 1 or 2 restrictions	7 days of water carting
Stage 3 or 4 restrictions	14 days of water carting

Bemm River system

Restriction level	Trigger
Voluntary restrictions and/or heightened awareness message to community	WTP capacity reduced to 75% of normal throughflow
Stage 1 or 2 restrictions	WTP capacity reduced to 50% of normal throughflow
Stage 3 or 4 restrictions	No output from WTP

Easing of restrictions

Restrictions may be eased in the reverse order if the forecast water availability improves, with consideration of climate conditions, time of year and demand trends, ensuring that restrictions are not reintroduced in the short-term.