



Moorabool River Seasonal Watering Proposal 2024-25

FINAL April 2024

*healthy and productive lands and waters
cared for by thriving communities*



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Acknowledgement of Country

Corangamite Catchment Management Authority wishes to acknowledge the Wadawurrung People of the Kulin Nation, Traditional Owners of the land and waters of Moorabool River. We pay our respects to their Elders past, present and emerging. We commit to continuing to work with all Traditional Owners to ensure their knowledge and culture is included and valued in Corangamite CMA planning and delivery.

1 CONTEXT

The Corangamite Catchment Management Authority (CMA) is pleased to provide the Moorabool River Seasonal Watering Proposal (SWP) 2024-25, part of the Living Moorabool Flagship project, for feedback. This SWP outlines Corangamite CMA's proposed priorities for the use of environmental water in the Moorabool River system in 2024-25, as required under section 192A of the Water Act 1989. The Victorian Environmental Water Holder (VEWH) will use this SWP to inform the development of the Seasonal Watering Plan 2024-25. This is a state-wide plan outlining where, when, and why water for the environment can be delivered throughout Victorian waterways.

The format of the 2024-25 SWP is shorter than previous years. The VEWH has amended the SWP guidelines in 2024-25 to reduce the length of the document, whilst still retaining key information relevant to watering. The current water year (2023-24) seasonal review section will not be included in this document as it has been in previous years. Instead, it will be created separately in mid-2024 and will be provided to the VEWH and the Moorabool Stakeholder Advisory Committee (MSAC) when completed. Undertaking the seasonal review at the end of the water year will allow for all environmental watering to be reported on after it has occurred, rather than doing a review that misses several months and/or speculates on watering.

The separate seasonal review document will include content on climate, hydrological achievement, ecological observations, and community observations.

Table 1: Summary of priority watering actions for the Moorabool River 2024-25

Environmental allocation: ~2500ML/year – Planning for an average year
Priority 1: Summer/autumn low flow (Dec-May) 5-40ML/day continuously
Priority 2: Winter/spring low flow (Jun-Nov) 5-60ML/day continuously
Priority 3: Summer/autumn fresh event (Apr-May) 60-80ML/day for 5 days
Priority 4: Summer/autumn fresh event (Jan-Feb) 60-80ML/day for 5 days
Priority 5: Little summer/autumn fresh event (Feb-Mar) 30-60ML/day for 3 days
Priority 6: Winter/spring fresh event (Sep-Nov) 80-90ML/day for 5-10 days
Priority 7: Winter/spring fresh event (May-Aug) 80-90ML/day for 5-10 days
Priority 8: Winter/spring fresh event (Sep-Nov) 80-90ML/day for 5-10 days

Key sections of the SWP that outline planning for the Moorabool's environmental water entitlement include:

- **Scope of environmental watering** – which describes the range of potential watering actions which may be delivered during 2024-25 (see outline above).
- **Scenario planning** – which describes how the combination of actions may change depending on the climate scenario.
- **Risk management** – this is an important chapter of the proposal, and agencies will be asked if the risks identified can be managed in line with the mitigating actions identified as part of their endorsement.

2 SYSTEM OVERVIEW

Waterway Manager: Corangamite Catchment Management Authority

Storage Manager: Central Highlands Water

Environmental Water Holder: Victorian Environmental Water Holder

Land Manager: Not applicable

Proportions of water entitlements in the Moorabool system held by private users, water corporations and environmental water holders on 30 June 2020.

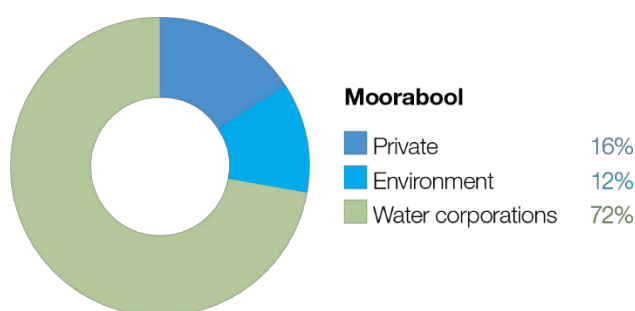


Figure 1: Water entitlements in the Moorabool Basin.

The Moorabool River is a tributary of the Barwon River. It flows south from the Central Highlands between Ballarat and Ballan to join the Barwon River at Fyansford, just north of Geelong (Figure 2). The Moorabool catchment is highly regulated with 65% of the catchment listed as agriculture-related land cover (DELWP, 2021). It has three major storages, including Lal Lal, Moorabool, and Bostock reservoirs.

The lower section of the Moorabool River between She Oaks and Batesford has nine private diversion weirs that are significant barriers to fish. These barriers have increased the extent of slow-flowing habitat and reduced habitat diversity.

Water allocated to the Moorabool River environmental entitlement is stored in Lal Lal Reservoir. The entitlement references passing flow, a significant component of annual streamflow, and helps maintain a low flow through winter. Passing flow is not part of the environmental water entitlement. Water use is limited by inflows to the reservoir and by a use cap specified in the entitlement.

The priority reaches for deliveries of water for the environment are between Lal Lal Reservoir and She Oaks Weir (reaches 3a and 3b, as shown in Figure 2), as that is where the available water can have the most benefit. Environmental flows may also benefit flow-dependent values in the reach between She Oaks Weir and the confluence with the Barwon River (reach 4).

The volume and timing of annual environmental water releases, of which Corangamite CMA has 2500 ML available to release each water year, is informed by the Moorabool FLOWS Study Update 2015 (Jacobs, 2015). Flow studies tell us about the timing, watering duration and amount of water needed to sustain environmental values. They provide flow-dependent environmental objectives and outline the flow regime required to meet these objectives through environmental flow recommendations. The Moorabool FLOWS Study Update highlights that the volume of water in the

environmental entitlement is insufficient to meet all the recommended flow components identified, and currently only provides for about 10% of the river's flow needs. It is worth noting the amount of water that enters the river is also substantially reduced by the many farm dams in the catchment, estimated at more than 4,000 (Sinclair, Knight, Merz 2003).

The Moorabool system is a water supply catchment for Barwon Water and Central Highlands Water. Releases from Lal Lal Reservoir for urban water supply (transfers usually occur from December to April) contribute to environmental outcomes in reaches 3a and 3b (above Barwon Water's diversion point at She Oaks) and allow more efficient delivery of water for the environment to reach 4. Barwon Water and Corangamite CMA coordinate operational and environmental releases, where possible, to optimise these benefits.

No environmental entitlement currently exists for Bostock or Moorabool Reservoirs, however passing flow rules are in place. Additionally, the Central and Gippsland Region Sustainable Water Strategy (DELWP, 2022) Policy 8-2 outlines that the Victorian Government will return up to 700ML to the Moorabool River east branch (in Bostock) by 2032, to be shared between the environment and Wadawurrung Traditional Owners. Up to 3GL will also be recovered in Lal Lal Reservoir to be shared.

Downstream of the Moorabool Reservoir the passing flow requirements are the lesser of 3ML/day or gauged inflows into the reservoir. For Bostock Reservoir, it is the lesser of flow into the reservoir and 1.2ML/day from December to July and 0.8ML/day from August to November.

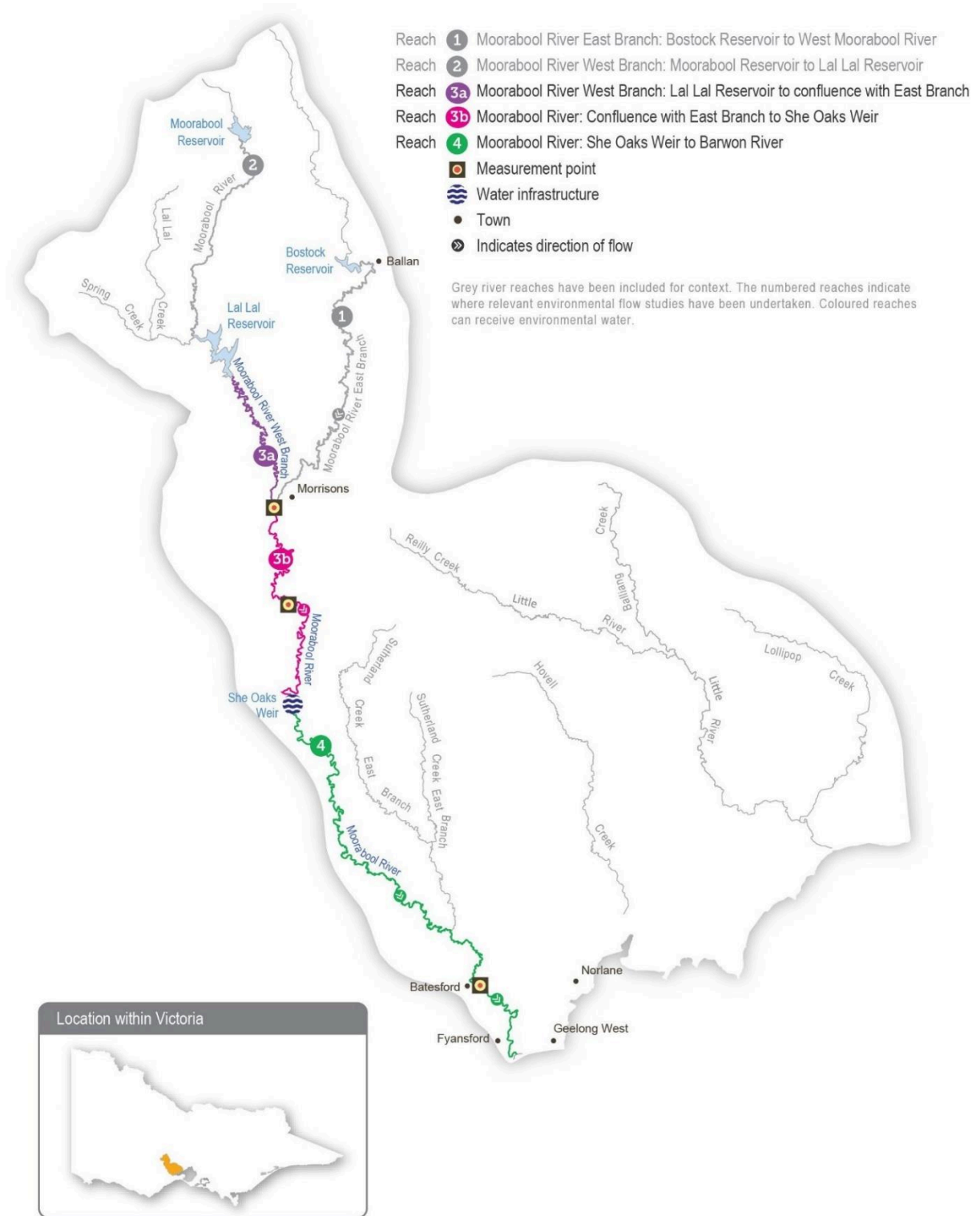


Figure 2: The Moorabool System

3 TRADITIONAL OWNER CULTURAL VALUES AND USES

The Wadawurrung are the Traditional Owners of the land of Moorabool River and parts of the Barwon, Leigh and Yarrowee rivers. Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC) are the statutory authority for the management of Aboriginal heritage values and culture, under the Victorian Aboriginal Heritage Act, 2006.

Wadawurrung Traditional Owners have a strong connection to Moorabool River and place high cultural value on it. They are a key partner in advocating for additional water recovery to help support a healthy river and associated cultural water objectives.

In 2020, WTOAC released *Paleert Tjaara Dja Let's make Country good together 2020 – 2030 Wadawurrung Country Plan*. The plan identifies waterways, rivers, estuaries, and wetlands as key values to look after.

In 2019, WTOAC partnered with Corangamite CMA to complete an environmental flows study for the Upper Barwon, Yarrowee and Leigh rivers. The 2019 flows study also identified cultural values in all waterways within Wadawurrung Country, including the Moorabool River.

The values include:

- significant aquatic species such as platypus, short-finned eel, native trout galaxias spp, tupong, river blackfish, common reed and cumbungi/typha latifolia, which are traditional sources of food, materials and medicines.
- waterway confluences and deep pools, which are places for meeting, ceremonies, trade and marking clan boundaries.

Table 2: Traditional Owner Values and Uses

River / wetland	Traditional Owner group	Category	Objectives & opportunities	Values & uses	How will this opportunity be considered environmental watering in 2024-25?
Moorabool River	Wadawurrung Traditional Owner Aboriginal Corporation (WTOAC)	Culturally significant species	Maintain or improve abundance, breeding, and recruitment of platypus.	Meat and pelt.	Environmental watering will aim to provide pool habitat and connectivity between reaches.
			Maintain or improve abundance of eels.	Meat, important food source sometimes smoked. Large gatherings during eel run at Buckley's Falls.	Environmental watering aims to provide water for pools, habitat, and food sources, as well as providing water over riffles to allow eels to migrate.
			Maintain or improve abundance of native trout galaxias spp.	Meat.	Environmental watering aims to provide water for pools, habitat, and food sources; and provide water over riffles to allow fish to move between pools and breed, feed and find new habitats.
			Maintain or improve abundance of river blackfish.	Meat.	
			Maintain or improve abundance of water ribbons/triglochis procera.	Plant food. Finger shaped tubers are crisp and sweet. Cooked in ground oven.	Environmental watering aims to maintain adequate depth of water in channels.
			Maintain or improve condition, extent, and abundance of common reed/phragmites australis, pale rush/juncus pallidus, and cumbungi/typha latifolia.	Common reed phragmites australis): Weapon-stems used for spear shafts for fishing. Reed cut while still green to make necklaces, weaving- bags and baskets. Also, a food plant. Weaving baskets.	Environmental watering aims to maintain adequate depth of water to limit terrestrial encroachment into aquatic habitats. This will also support growth on terraces, channel edges and lower banks.

River / wetland	Traditional Owner group	Category	Objectives & opportunities	Values & uses	How will this opportunity be considered environmental watering in 2024-25?
				Fluff used to pack wounds under paperbark bandage.	
			Maintain or improve abundance of river red gum/eucalyptus camaldulensis.	Bark removed for canoe, shelter, and tools. Bowls, nectar drink, medicinal – gum or sap was used for burns to shrink or seal them; the sap is high in tannin. Leaves for steam baths.	
			Maintain or improve abundance of manna gum/eucalyptus viminalis and swamp wallaby grass/amphibromus reservatus.	Timber used for making club-shields called. Sap sucking lerp bug gathered each season. Young leaves were fed onto fire near patient. Poultice of well chewed leaves applied for back ache. Quail flocks attracted to Manna. Leaves split, dried out and re-constituted in running water. Fibres twisted into rope to make long nets for game hunting.	Environmental watering cannot consider this in 2023-24 due to various constraints such as an insufficient entitlement.
		Physical Features	Deep pools.	The presence of deep pools has cultural significance.	Environmental watering will aid in filling and ensuring connectivity to pools where possible.

River / wetland	Traditional Owner group	Category	Objectives & opportunities	Values & uses	How will this opportunity be considered environmental watering in 2024-25?
			Confluences e.g. Moorabool and Barwon.	High cultural value due to historical use of site as a meeting place for three different clans.	Environmental watering will aim to maintain adequate depth of water for connectivity.
		Events	Holding cultural events on the Moorabool.	Celebration of culture, family events, fishing days, cultural festivals.	Summer/autumn fresh events and some winter/spring fresh events can be delivered to coincide with cultural events. This can support significant cultural values and species for the lead-up to or duration of an event.

4 SOCIAL, RECREATIONAL AND ECONOMIC VALUES AND USES

Social, recreational, and economic values and uses are variables that legislation states waterway managers must consider when delivering environmental water. As the waterway manager, the Corangamite CMA considers opportunities to support cultural, social, recreational and economic values and uses where ever possible when planning environmental water deliveries, as long as the delivery does not compromise environmental outcomes.

In planning the potential environmental watering actions in Table 1, Corangamite CMA considered how environmental flows could support values and uses, including:

- water-based recreation (such as camping, fishing, kayaking and swimming)
- riverside recreation and amenity (such as birdwatching, bushwalking, camping, picnicking and lookouts), community events and tourism.

The timing or management of planned environmental flows will not be modified to align with a community benefit. Recreational activities that may share the benefits because of environmental water releases include:

- Camping
- Canoeing, kayaking, rowing, swimming
- Angling

Summer/autumn freshes provide a larger flow volume than low flow in the Moorabool River and may incidentally coincide with school and public holidays. This aspect of considering times of peak recreational use when planning releases is a requirements in the Water Act ([Section 33DD-2](#)). This freshened flow improves riverside and water-based recreation opportunities, particularly camping and fishing.






Table 3: Social, recreational, and economic shared benefits for the Moorabool River for 2024-25

Waterway	Beneficiary	Connection to the river	Values / uses / objectives / opportunities	How have these benefits been considered?
Moorabool River	Recreation: angling	Angling is important for social and recreational purposes. Anglers have an interest in maintaining a healthy system.	A healthy fish population is important as it provides opportunities for recreational fishing.	Environmental watering supports a healthy system. Low flow watering aids in supporting connectivity throughout the reaches and allows fish to move. Fresh events aid in maintaining and expanding migratory fish populations as they trigger migration and support their life cycle.
	Camping	Camping plays an important social and economic role in the Moorabool system. Those who camp on the Moorabool are more likely to have an interest in maintaining a healthy river system. Camping may also result in economic benefits for communities surrounding the river.	Adequate water quality and flow is essential for maintaining desirable aesthetics for camping.	Environmental watering supports a healthy system with good water quality and flow as well as supporting fringing vegetation.
	Recreation: water-based, e.g. canoeing, swimming	Water based recreational activities are important for social and recreational purposes. Those who engage with the natural environment are likely to support the idea of maintaining a healthy system.	Adequate water quality, depth and connectivity is important for those who are engaging in recreational water activities.	Environmental watering supports a healthy, flowing, and connected system with adequate depth to ensure more opportunities for those engaging in recreational water activities. Due to the insufficient entitlement, environmental

Waterway	Beneficiary	Connection to the river	Values / uses / objectives / opportunities	How have these benefits been considered?
				water can only support these benefits in reach 3a, 3b and 4.
	Community events	Events on the river are important for social and economic reasons. Use of the river for events supplements economic benefits for the towns and communities around the Moorabool.	Adequate water quality, flow and connectivity is important for supporting community events.	Environmental watering supports a healthy, flowing, and connected system. Strong environmental values also supports events that can be held on the river.

5 ENVIRONMENTAL VALUES AND OBJECTIVES

The Moorabool River is a highly flow-stressed system, but it retains significant environmental values. The river is home to native fish species, including the Australian grayling, river blackfish, Australian smelt, flat-headed gudgeon, southern pygmy perch, short-finned eel, spotted galaxias, and tupong. The system contains extensive areas of endangered remnant vegetation, including streambank shrubland and streamside woodland ecological vegetation communities. Platypus, rakali (native water rats), and a range of waterbugs are also present. The Moorabool River flows into the Barwon River, connecting it to the Ramsar-listed Lower Barwon wetlands.

Environmental objectives in the Moorabool system	
	<p>F1 – Increase the distribution, abundance, and diversity of migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, and Australian grayling).</p> <p>F2 – Increase the distribution, abundance, and diversity of non-migratory species (flat-headed gudgeon, Australian smelt, southern pygmy perch, and river blackfish).</p>
	PR1 – Maintain a self-sustaining breeding population of platypus and support the dispersal of juveniles and the movement of adults.
	<p>V1 – Maintain in-stream macrophyte communities.</p> <p>V2 – Maintain streamside vegetation communities and promote recruitment.</p>
	MI1 – Maintain the abundance and diversity of waterbug communities.
	<p>WQ1 – Maintain water quality.</p> <p>WQ2 – Prevent hypoxic blackwater events.</p>

6 ENGAGEMENT

Corangamite CMA engaged with WTOAC during the development of this proposal via email and online meeting. WTOAC approved the SWP and provided their endorsement. The partnership that Corangamite CMA has with WTOAC has led to the recognition of the cultural values of rivers on Wadawurrung Country within this proposal, and the importance of cultural flows and celebration events.

Corangamite CMA provided the Moorabool Stakeholder Advisory Committee (MSAC) a draft of this proposal to review in early 2024. The MSAC had two weeks to provide feedback via email or phone, which was recorded on an identified feedback register. Corangamite CMA will hold the annual in-person MSAC meeting in mid-2024. The MSAC was established by Corangamite CMA in 2014 to support the development of SWPs, the Moorabool Environmental Water Management Plan and any scientific studies relating to flows in the river (e.g. 2015 Moorabool River FLOWS Study Update). Into the future, prospective group members can submit an application via the Corangamite CMA website. To be considered as a member, applicants must have:

- an active interest in the health and management of the Moorabool River and/or represent a major user or user group
- the ability to represent an established community user group
- commitment to work within the Terms of Reference

Both WTOAC, the MSAC, and a broader notification list are notified of all environmental flow releases throughout the year, and Corangamite CMA also works with stakeholders individually on specific issues related to the management of environmental water as they arise.

This watering proposal is underpinned by technical expertise and advice; however, local and Traditional Owner knowledge and input has added significant value, in particular:

- Feedback and advice on the landscape characteristics of the reaches and any other localised considerations or observations relating to the rivers
- The realities and feasibility of water delivery volumes and timing
- Anecdotal observation and accounts of environmental watering
- New and emerging shared benefits.

Ongoing engagement with relevant stakeholders has provided community members and Traditional Owners with information and knowledge sharing opportunities. These activities focus on promoting the benefits of environmental water in the Moorabool River and keeps the relevant parties informed of releases. This ongoing engagement has included:

- Social media posts describing flows and their benefits to the system
- An environmental water presentation for Moorabool Catchment Landcare Group
- Walking on Country events with WTOAC
- Meetings with relevant parties regarding Dolly's Creek Road constraints
- Updates to the environmental flows webtool on the Corangamite CMA website

In early 2024, a meeting was held between Corangamite CMA and WTOAC to discuss proposed 2024-25 environmental flows in the Moorabool River. WTOAC supports the proposed environmental flows and may partner with Corangamite CMA to coordinate the delivery of summer/autumn freshes and some winter/spring freshes to coincide with cultural events.

WTOAC and Corangamite CMA also actively discussed Corangamite CMA supporting releases from Lal Lal obtained by WTOAC through temporary transfers with water corporations. This is an ongoing discussion that began in the 2023-24 water year (when WTOAC released 200 ML from Lal Lal and 70 ML from Bostock) with opportunity for further collaboration on releases for the 2024-25 water year. Frequent discussions regarding WTOAC planned releases aided in and will continue to inform environmental water release planning.

Notable Feedback

Support for the Moorabool River SWP 2024-25 was received from WTOAC, Department of Energy, Environment & Climate Action and Moorabool Catchment Landcare Group. Parks Victoria, Southern Rural Water, Central Highlands Water, Barwon Water, and Geelong Landcare Network had nothing to add to the proposal.

People for a Living Moorabool provided valuable feedback and expressed concern at the inclusion of section 4 and the consideration of shared benefits. They also raised their concern that the new meeting timing being trialled for the 2024-25 Environmental Water Advisory Group should allow for a face-to-face meeting prior to the SWP being complete. Moorabool Catchment Landcare Group provided quality insight into aspects of the proposal that were valuable inclusions.

Individuals or organisations can contact Corangamite CMA at info@ccma.vic.gov.au to request a copy of the Moorabool River SWP 2024-25 Comments Register. All responses to comments and actions undertaken as a result of them are listed in the Comments Register.

Table 4: Stakeholder engagement for the Moorabool River SWP 2024-25







Stakeholder(s)	Engagement Method	Engagement Purpose
People for a Living Moorabool Geelong Landcare Network Moorabool Catchment Landcare Group WaterWatch	Membership of MSAC Review of draft proposal and opportunity to provide formal feedback. Response to stakeholder on how their feedback influenced the SWP and why. Meeting to discuss previous water year at the end of the water year and seek input on future proposals. Attendance at community forums. Direct engagement (1 on 1).	<ul style="list-style-type: none"> • Seek user input to the development of the proposal and future proposals. • Review previous environmental watering actions and seek feedback on any outcomes and capture observations. • Provide an opportunity for individuals, agencies, and groups to contribute to the proposed watering actions and intended outcomes. • Identify opportunities to achieve shared benefits. • Assist in increasing awareness and understanding of the purpose and objectives of the environmental watering program for the Moorabool River. • Provide an opportunity for communities and groups to share the benefits of environmental watering. • Increase opportunities to support economic and social values in the region.
Department of Energy, Environment & Climate Action (DEECA) (Water & Catchments) Barwon Water Central Highlands Water Southern Rural Water Parks Victoria Victorian Environmental Water Holder	Membership of MSAC Review of draft proposal and opportunity to provide formal feedback. Response to stakeholder on how their feedback influenced the SWP and why. Meeting to discuss previous water year at the end of the water year and seek input on future proposals. Partnership meetings with links or relevance to seasonal water proposal development. Attendance at Community forums. Direct engagement (1 on 1).	
Individual landholder/farmer members of MSAC	Membership of MSAC Review of draft proposal and opportunity to provide formal feedback. Response to stakeholder on how their feedback influenced the SWP and why.	








	<p>Meeting to discuss previous water year at the end of the water year and seek input on future proposals.</p> <p>Partnership meetings with links or relevance to seasonal water proposal development.</p> <p>Attendance at Community forums.</p> <p>Direct engagement (1 on 1).</p>	
<p>Wadawurrung Traditional Owners Aboriginal Corporation (WTOAC)</p>	<p>Directly involved in the development of the SWP and its contents</p> <p>Review of draft proposal and opportunity to provide formal feedback.</p> <p>Response to stakeholder on how their feedback influenced the SWP and why.</p> <p>Meeting to discuss previous water year at the end of the water year and seek input on future proposals.</p> <p>Attendance at Community forums.</p> <p>Collaboration on WTOAC temporary transfer releases from Lal Lal.</p>	
<p>Adelaide Brighton Cement Company</p>	<p>Membership of MSAC</p> <p>Review of draft proposal and opportunity to provide formal feedback.</p> <p>Response to stakeholder on how their feedback influenced the SWP and why.</p> <p>Meeting to discuss previous water year at the end of the water year and seek input on future proposals.</p> <p>Partnership meetings with links or relevance to seasonal water proposal development.</p> <p>Attendance at Community forums.</p> <p>Direct engagement (1 on 1).</p>	








7 SCOPE OF ENVIRONMENTAL WATERING








Table 5: Potential Watering Actions in 2024-25








Note: further explanation of the environmental objectives can be found on page 16.

Potential environmental watering action	Expected watering effects	Environmental objectives
Moorabool River - reaches 3a & 3b		
<p>PWA 1 Summer/autumn low flow December to May 5-40 ML/d</p>	<p>Maintain water quality for biota during critical summer period.</p> <p>Maintain pool and riffle habitats for fish, macroinvertebrates, platypus and submerged aquatic vegetation.</p> <p>Higher flow magnitudes would have a greater impact on watering fringing vegetation.</p>	<div style="display: flex; flex-direction: column; gap: 10px;"> <div style="display: flex; align-items: flex-start;">  <p>WQ1 - Prevent low dissolved oxygen conditions and elevated EC conditions during low flow periods.</p> </div> <div style="display: flex; align-items: flex-start;">  <p>F1 - Rehabilitate migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, Australian grayling).</p> </div> <div style="display: flex; align-items: flex-start;">  <p>F2 - Maintain and expand populations of non-migratory fish species (flat-headed gudgeon, Australian smelt, southern pygmy perch, river blackfish).</p> </div> <div style="display: flex; align-items: flex-start;">  <p>V1 – Maintain aquatic zone species.</p> </div> <div style="display: flex; align-items: flex-start;">  <p>PR1 - Maintain platypus population, particularly in refuge pools during dry years; restore self-sustaining breeding population of platypus. Support dispersal of juvenile platypus to/from the Barwon River.</p> </div> <div style="display: flex; align-items: flex-start;">  <p>MI1 - Maintain the diversity and abundance of macroinvertebrates suited to both slow and fast flowing habitats.</p> </div> </div>

<p>PWA 2 Winter/spring low flow June to November 5-60 ML/d</p>	<p>Allow fish and platypus movement throughout the reach.</p> <p>Upstream migration of juvenile native trout galaxias spp., tupong, short-finned eel and Australian grayling.</p> <p>At higher continuous flow magnitudes, flows would inundate the full extent of the channel bed, maintain clear flow path and control intrusions by terrestrial vegetation.</p>	  	<p>F1 - Rehabilitate migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, Australian grayling).</p> <p>F2 - Maintain and expand populations of non-migratory fish species (flat-headed gudgeon, Australian smelt, southern pygmy perch, river blackfish).</p> <p>V1 – Maintain aquatic zone species.</p> <p>PR1 - Maintain platypus population and support dispersal.</p>
<p>PWA 3 Summer/autumn fresh April to May 60-80 ML/d 5 days</p>	<p>Flush silt and scour biofilms and algae from streambed.</p> <p>Water fringing vegetation.</p> <p>Allow fish and platypus movement through the reach and maintain access to habitat.</p> <p>Trigger downstream spawning migration of Australian grayling.</p>	   	<p>F1 - Rehabilitate migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, Australian grayling).</p> <p>F2 - Maintain and expand populations of non-migratory fish species (flat-headed gudgeon, Australian smelt, southern pygmy perch, river blackfish).</p> <p>V2 - Maintain marginal zone species. Maintain damp zone species.</p> <p>PR1 - Maintain platypus population and support dispersal.</p> <p>MI1 - Maintain the diversity and abundance of macroinvertebrates suited to both slow and fast flowing habitats.</p>

<p>PWA 4 Summer/autumn fresh January to February 60-80 ML/d 5 days</p>	<p>Flush silt and scour biofilms and algae from streambed. Water fringing vegetation. Allow fish and platypus movement through the reach and maintain access to habitat. Trigger downstream spawning migration of adult short-finned eel.</p>	   	<p>F1 - Rehabilitate migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, Australian grayling). F2 - Maintain and expand populations of non-migratory fish species (flat-headed gudgeon, Australian smelt, southern pygmy perch, river blackfish). V2 - Maintain marginal zone species. Maintain damp zone species. PR1 - Maintain platypus population and support dispersal. MI1 - Maintain the diversity and abundance of macroinvertebrates suited to both slow and fast flowing habitats.</p>
<p>PWA 5 Little summer/autumn fresh February to March 30-60 ML/day 3 days</p>	<p>Allow fish and platypus movement throughout the reach. Maintain clear flow path and control intrusions by terrestrial vegetation. Flush silt and scour biofilms and algae from streambed and transport organic matter. Water fringing vegetation.</p>	  	<p>F1 - Rehabilitate migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, Australian grayling). F2 - Maintain and expand populations of non-migratory fish species (flat-headed gudgeon, Australian smelt, southern pygmy perch, river blackfish). V2 - Maintain marginal zone species. Maintain damp zone species. PR1 - Maintain platypus population and support dispersal.</p>

			MI1 - Maintain the diversity and abundance of macroinvertebrates suited to both slow and fast flowing habitats.
<p>PWA 6 Spring fresh September to November 80-90 ML/day 5-10 days</p>	<p>Allow fish and platypus movement throughout the reach.</p> <p>Maintain clear flow path and control intrusions by terrestrial vegetation.</p> <p>Upstream migration of juvenile galaxias spp., tupong, short-finned eel and Australian grayling.</p> <p>Flush silt and scour biofilms and algae from streambed and transport organic matter.</p> <p>Promote growth and recruitment of native riparian vegetation including woody shrubs and promote strong vegetation zonation on the banks.</p>	   	<p>F1 - Rehabilitate migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, Australian grayling).</p> <p>F2 - Maintain and expand populations of non-migratory fish species (flat-headed gudgeon, Australian smelt, southern pygmy perch, river blackfish).</p> <p>V1 – Maintain aquatic zone species.</p> <p>V2 - Maintain marginal zone species. Maintain damp zone species.</p> <p>PR1 - Maintain platypus population and support dispersal.</p> <p>MI1 - Maintain the diversity and abundance of macroinvertebrates suited to both slow and fast flowing habitats.</p>
<p>PWA 7 Winter fresh June to August 80-90 ML/d 5-10 days</p>	<p>Allow fish and platypus movement throughout the reach.</p> <p>Maintain clear flow path and control intrusions by terrestrial vegetation.</p> <p>Downstream spawning migration of adult tupong.</p> <p>Flush silt and scour biofilms and algae from streambed</p>	 	<p>F1 - Rehabilitate migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, Australian grayling).</p> <p>F2 - Maintain and expand populations of non-migratory fish species (flat-headed gudgeon, Australian smelt, southern pygmy perch, river blackfish).</p> <p>V1 – Maintain aquatic zone species.</p>

	<p>and transport organic matter.</p> <p>Promote growth and recruitment of native riparian vegetation including woody shrubs and promote strong vegetation zonation on the banks.</p>	 	<p>V2 - Maintain marginal zone species. Maintain damp zone species.</p> <p>PR1 - Maintain platypus population and support dispersal.</p> <p>MI1 - Maintain the diversity and abundance of macroinvertebrates suited to both slow and fast flowing habitats.</p>
<p>PWA 8 Spring fresh September to November 80-90 ML/day 5-10 days</p>	<p>Allow fish and platypus movement throughout the reach.</p> <p>Maintain clear flow path and control intrusions by terrestrial vegetation.</p> <p>Upstream migration of juvenile galaxias spp., tupong, short-finned eel and Australian grayling.</p> <p>Flush silt and scour biofilms and algae from streambed and transport organic matter.</p> <p>Promote growth and recruitment of native riparian vegetation including woody shrubs and promote strong vegetation zonation on the banks.</p>	   	<p>F1 - Rehabilitate migratory species (tupong, short-finned eel, common galaxias, spotted galaxias, short-headed lamprey, Australian grayling).</p> <p>V1 – Maintain aquatic zone species.</p> <p>V2 - Maintain marginal zone species. Maintain damp zone species.</p> <p>PR1 - Maintain platypus population and support dispersal.</p> <p>MI1 - Maintain the diversity and abundance of macroinvertebrates suited to both slow and fast flowing habitats.</p>
<p>Trigger-based Fresh Drought scenario 30 ML/day 3 days</p> <p>Environmental or hydrological triggers</p>	<p>Improve water quality.</p> <p>Maintain aquatic life.</p>		<p>WQ1 - Prevent low dissolved oxygen conditions and elevated EC conditions during low flow periods.</p> <p>WQ2 – Prevent hypoxic blackwater events.</p>

<ul style="list-style-type: none">• Dissolved oxygen \leq 5 mg/L• Electrical conductivity \geq 10,000 μs/cm• Water temperature \geq 25°C			
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8 SCENARIO PLANNING

Table 6: Scenario Planning in 2024-25

Planning scenario	Drought	Dry	Average	Wet
Expected conditions	<ul style="list-style-type: none"> Little rainfall with no inflow to Lal Lal Reservoir Regular periods of no flow 	<ul style="list-style-type: none"> Below-average rainfall and inflow to Lal Lal Reservoir Cease-to-flow events 	<ul style="list-style-type: none"> Average rainfall and moderate inflows to Lal Lal Reservoir, especially during winter and spring Low flow over summer and high peaks in winter months 	<ul style="list-style-type: none"> Lal Lal Reservoir is likely to fill and spill Continuous flow year-round Overbank flow in some parts during winter/spring
Expected availability of water for the environment	<ul style="list-style-type: none"> 2,500 ML (7,086 ML limited by entitlement cap) 			
Moorabool River - reach 3a & 3b				
Potential environmental watering – tier 1 (high priorities)	Tier 1a (can be achieved with predicted supply)			
	<ul style="list-style-type: none"> Top Priority – trigger- based freshes (30 ML/day x 2). Priority 1 – summer/autumn low flow (5 ML/day Dec-May). Priority 2 – winter/spring low flow (5 ML/day Jun-Nov). Priority 3 – Apr/May summer/autumn fresh (60 ML/day x 5). 	<ul style="list-style-type: none"> Priority 1 – summer/autumn low flow (5 ML/day Dec-May). Priority 2 – winter/spring low flow (5 ML/day Jun-Nov, partial only – two months achieved naturally). Priority 3 – Apr/May summer/autumn fresh (60 ML/day x 5). Priority 4 – Sep/Nov spring fresh (80 ML/day x 5). 	<ul style="list-style-type: none"> Priority 1 – summer/autumn low flow (5 ML/day Dec-May). Priority 2 – winter/spring low flow (5 ML/day Jun-Nov, achieved naturally). Priority 3 – Apr/May summer/autumn fresh (60 ML/day x 5). Priority 4 – Jan/Feb summer/autumn fresh (60 ML/day x5) Priority 5 – little summer fresh (30 ML/day x3) Priority 6 – Sep/Nov spring fresh (80 ML/day x 5). Priority 7 – Jun/Aug winter fresh (80 ML/day x 5). 	<ul style="list-style-type: none"> Priority 1 – summer/autumn low flow (>10 ML/d achieved naturally Dec-May). Priority 2 – winter/spring low flow (>10 ML/d achieved naturally June-Nov). Priority 3 – Apr/May summer/autumn fresh (60 ML/day x 5). Priority 4 – Jan/Feb summer/autumn fresh (60 ML/day x 5). Priority 5 – Feb/Mar little summer fresh (30 ML/day x 3). Priority 6 – Sep/Nov spring fresh (achieved naturally). Priority 7 – Jun/Aug winter fresh (achieved naturally). Priority 8 – Sep/Nov spring fresh (achieved)

Planning scenario	Drought	Dry	Average	Wet
				naturally).
	Tier 1b (supply deficit)			
	<ul style="list-style-type: none"> • Priority 4 – Sep/Nov spring fresh (80ML/day x 5) • Priority 5 – Jun/Aug winter fresh (80 ML/day x 5) 	<ul style="list-style-type: none"> • Priority 5 – Jun/Aug winter fresh (80 ML/day x 5) 	<ul style="list-style-type: none"> • Priority 8 – Sep/Nov spring fresh (80 ML/day x 5) 	<ul style="list-style-type: none"> • In this scenario in 2024-25 there are no tier 1b watering actions
Potential environmental watering – tier 2 (additional priorities)	<ul style="list-style-type: none"> • Priority 1 – summer/autumn low flow at 10 ML/day rather than 5 • Priority 2 – winter/spring low flow at 10 ML/day rather than 5 • Priority 3 – Apr/May summer/autumn fresh to an aspirational peak of >60 ML/d x 5 (actual volume dependent on volume of winter/spring freshes) • Priority 4 – Sep/Nov spring fresh to an aspirational peak and duration of up to 90 ML/day x 10 • Priority 5 – Jun/Aug spring fresh to an aspirational peak and duration of up to 90 ML/day x 10 	<ul style="list-style-type: none"> • Priority 1 – summer/autumn low flow at 10 ML/day rather than 5 • Priority 2 – winter/spring low flow at 10 ML/day rather than 5 • Priority 3 – Apr/May summer/autumn fresh to an aspirational peak of >60 ML/day x 5 (actual volume dependent on volume of winter/spring freshes) • Priority 4 – Sep/Nov spring fresh to an aspirational peak and duration of up to 90 ML/day x 10 • Priority 5 – Jun-Aug winter fresh to an aspirational peak and duration of up to 90 ML/day x 10 	<ul style="list-style-type: none"> • Priority 1 – summer/autumn low flow at an aspirational level (up to 20 ML/d if not met naturally at this level) • Priority 2 – winter/spring low flow at an aspirational level (up to 60 ML/day) • Priority 3 – Apr/May summer/autumn fresh to an aspirational peak of >60 ML/day x 5 (actual volume dependent on volume of winter/spring freshes) • Priority 4 – Jan/Feb summer/autumn fresh to an aspirational peak of >60 ML/day x 5 (actual volume dependent on volume of winter/spring freshes) • Priority 5 – Feb/Mar little summer fresh to an aspirational peak of >30 ML/day x 3 (actual volume dependent on volume of other freshes) 	<ul style="list-style-type: none"> • Priority 1 – summer/autumn low flow at an aspirational level (up to 20 ML/day if not met naturally at this level) • Priority 2 – winter/spring low flow at an aspirational level if not met naturally at this level (up to 60 ML/day) • Priority 3 – Apr/May summer/autumn fresh to an aspirational peak of >60 ML/day x 5 (actual volume dependent on volume of winter/spring freshes) • Priority 4 – Jan/Feb summer/autumn fresh to an aspirational peak of >60 ML/day x 5 (actual volume dependent on volume of winter/spring freshes) • Priority 5 – Feb/Mar little summer fresh to an aspirational peak of >30 ML/day x 3 (actual volume dependent on volume of other freshes)

Planning scenario	Drought	Dry	Average	Wet
			<ul style="list-style-type: none"> • Priority 6 – Sep/Nov spring fresh to an aspirational peak and duration of up to 90 ML/day x 10 • Priority 7 – Jun/Aug winter fresh to an aspirational peak and duration of up to 90 ML/day x 10 • Priority 8 – Sep/Nov spring fresh to an aspirational peak and duration of up to 90 ML/day x 10 	freshes)
Possible volume of water for the environment required to achieve objectives	<ul style="list-style-type: none"> • 2,493 ML (Tier 1a) • 1,130 ML (Tier 1b) • 3,076 ML (Tier 2) 	<ul style="list-style-type: none"> • 2,508 ML (Tier 1a) • 565 ML (Tier 1b) • 3,076 ML (Tier 2) 	<ul style="list-style-type: none"> • 2,400 ML (Tier 1a) • 495 ML (Tier 1b) • 15,369 ML (Tier 2) 	<ul style="list-style-type: none"> • 780 ML (Tier 1a) • 0 ML (Tier 1b) • 9,140 ML (Tier 2)
Priority carryover requirements for 2024-25	1,000 ML, however supply will be close to full (>7 GL) and won't limit full use of entitlement in 2024-25.			

Planning for this year’s environmental watering has been tailored to average rainfall conditions but may be adapted if conditions change. Table 6 outlines how achievement of priorities may change under a range of resource availability and climate scenarios. In the driest scenarios the priority is to avoid critical losses or catastrophic events, while in wetter years the priority is to maximise recruitment and maintain geomorphic processes. The ecological objectives of environmental watering under different climates considers impacts from four different seasonal outcomes, ranging through drought, dry, average, and wet.

The increased capacity to meet a larger number of priority flow components in wetter years is possible as more elements will be met by naturally occurring flows. However, because the current entitlement only secures 10% of the river’s water requirements, the achievement of environmental flow components is largely dependent on the climate during the 2024-25 water year and the assistance of Barwon Water’s (BW) potable water transfers during summer (BW’s transfers are not included in the scenario planning table volumes).

Changes in tier 1a, 1b and 2 totals are due to amendments made in calculations over previous years. The updated totals factor in all relevant priorities for each climatic scenario along with the assumptions of passing flow during these separate conditions.

Any remaining water under the 2500 ML limit will be used to provide variation in low flow and to bolster freshes where necessary.

8.1 Seasonal outlook

The Barwon Southwest region has a temperate climate, with mild to warm summers and cold winters. Summer average maximum temperatures are around 22-24°C near the coast and in elevated areas, and 25-27°C inland. Winter average maximum temperatures are around 12-14°C. Rainfall occurs mostly in winter and spring and is generally the result of rain-bearing weather systems coming from the west (DELWP, 2015). Climate change continues to influence Australian and global climates. Australia's climate has warmed by around 1.47°C over the period 1910–2021. There has also been a trend towards a greater proportion of rainfall from high intensity short duration rainfall events, especially across northern Australia (Climate Driver Update Archive BOM (2023b, February)). Regarding long term climate projection based on a medium (RCP4.5) emissions scenario, annual rainfall totals are likely to decline by 25% by the end of the decade, with the greatest drying to occur in spring. As warming continues, more heat extremes will occur.

The Bureau of Meteorology (BOM) states that at the time of writing (April 2024) El Niño is near its end with the expectation that conditions will return to neutral before the start of the 2024-25 water year. The BOM also states that four out of seven climate models are predicting a La Nina by late winter 2024. However, the BOM also states that current forecasts beyond May should be used with caution (BOM, 2024). Considering this it is thought that on balance, average rainfall is likely for the upcoming water year and Corangamite CMA will plan watering in line with an average climatic scenario, noting adaptive management may be required to respond to ambient conditions if La Nina returns and influences the Corangamite Region.

9 RISK MANAGEMENT

A risk assessment was undertaken by Corangamite CMA for the 2024-25 season on the 4th of March 2024, with Barwon Water, the VEWH and Parks Victoria.

This assessment identified the risks associated with delivering water for the priority actions. Mitigation actions to reduce risks have been identified and should be undertaken as part of the release plan.

An overview of the risk assessment and management for the current plan with potential risk mitigation measures and associated residual risk assessment can be found below.

Table 7: Risk assessment for 2024-25

Risk ID	Risk Category	Risk Description	Likelihood	Conseq	Risk Rating	Mitigation actions	Residual Risk Rating	Lead organism. for action	Risk type Static/ Dynamic
CEMO2020-15	Environment	Inability to maintain summer base flows in reaches 3A & 3B with available environmental water volumes (under dry conditions and noting Barwon Water do not take water from Lal Lal reservoir over winter), resulting in adverse environmental impacts. Note: consequence rating is based on experience in recent years	Possible	Moderate	Medium	<ul style="list-style-type: none"> • Maintain close communications with Barwon Water to understand expected demands from Lal Lal and design transfer regime to support base flows where possible • Monitor system closely and adjust plans to ensure most effective use of available environmental water volumes. - consult with storage manager for specific response options in critical/high risk periods <p>Note: mitigations not fully effective in average to dry years, residual risk assessed for 23-24 conditions and expected water transfers</p>	Low	CCMA	Dynamic
CEMO2020-16	Environment	Inability to maintain summer base flows in reach 4 (especially under drier conditions) with available environmental water volumes, resulting in adverse environmental impacts. Note: This is a strategic issue related to e-water availability in the Moorabool, rather than delivery planning decisions	Likely	Moderate	Medium	<ul style="list-style-type: none"> • Monitor flows in collaboration with quarry operator , and communicate situation to community, and where possible make releases to maintain pools and connectivity. • Develop long term engineering solutions to remove physical barriers to fish movement. • Consider accessing additional water through trade - Develop options for greater flexibility to bank water and change flows through SWS process <p>Note: residual risk assessed for 23-24 conditions and expected water transfers This is a longer term strategic issue, and risk is not directly attributable to e-watering actions. However mitigations are still relevant</p>	Medium	CCMA VEWH VEWH/CCMA	Dynamic
CEMO2020-17	Environment	Inability to deliver environmental water due to BGA blooms in Lal Lal Reservoir, which may limit releases to the Moorabool River to prevent environmental and human health impacts. Note: releases for consumptive purposes will still probably be	Unlikely	Minor	Low	Monitor algal levels and review release options and risks throughout the season.	Low	CHW	Static

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		required, so environmental releases don't increase human safety risks significantly							
CEMO2020-18	Environment	Environmental releases do not achieve planned/specified flow targets due to releases being diverted by other users before reaching delivery site	Likely	Minor	Low	<ul style="list-style-type: none"> • Ensure licensing authority is aware of planned events and alert it to the need to manage compliance by all users. • Work with SRW to improve diversions compliance management options (as per EWMP recommendations). 	Low	CCMA	Static
CEMO2020-19	Environment	A widespread power failure at Lal Lal may require shutdown of the hydro station releases, resulting in a sudden reduction in environmental flow rates until releases can be restored (which may take up to 3 hours). This may lead to environmental impacts.	Unlikely	Minor	Low	<ul style="list-style-type: none"> • Monitor site conditions and call out staff to manually restore releases as soon as possible. 	Low	CHW	Static
CEMO2020-20	Safety	Interference or accumulation of debris may result in blockage of the pipe at the Morrison's Junction road crossing, leading to overtopping of the road and safety issues for road users. Note: likelihood considers environmental water impact on creating a blockage	Unlikely	Major	Low	<ul style="list-style-type: none"> • Undertake inspections prior to commencing environmental releases to ensure the pipe is clear. 	Low	CCMA	Static
CEMO2020-21	Legal	Heavy rainfall following environmental deliveries may lead to unintended inundation of private land resulting in impacts on landowner activities and assets.	Possible	Minor	Low	<ul style="list-style-type: none"> • Undertake detailed monitoring of water levels and adjust delivery plans based on seasonal conditions and forecasts. 	Low	CCMA	Static
CEMO2022-29	Environment	Capacity limits at Dolly's Ck Rd crossing limit max flows to 90 ML/d, leading to an inability to supplement some event due to safety concerns, resulting in failure to meet higher environmental flow requirements. Note that access to increased e-water volumes may exacerbate	Likely	Moderate	Medium	<ul style="list-style-type: none"> - Continue attempts to contact LGA to seek upgrade of road crossing - Monitor flows closely and adapt plans as necessary 	Low	CCMA	Dynamic


		<p>this risk</p> <ul style="list-style-type: none"> - increased e-water volumes may also result in a change in compliance point location to include reach 4 and the impact of this constraint will increase - risk based on cumulative impacts on environmental impacts of failure to deliver higher flows 							
CEMO2022-30	Safety	<p>Unexpected rain events can lead to capacity limits at Dolly's Ck Rd crossing being exceeded contributing to flows over the road, with safety risks to road users. This may occur during an environmental delivery, however the e-water volume contribution is minor - pre-mitigation risk reflects this</p>	Unlikely	Minor	Low	<ul style="list-style-type: none"> - Continue attempts to contact LGA to seek upgrade of road crossing - Monitor flows closely and adapt plans as necessary - Include provision in water order for cessation of releases under sudden rain events <p>The mitigation actions will eliminate the potential for e-watering to create a hazard on the road, therefore the risk is avoided - residual risk based on this. Need to monitor this issue for compounding impacts of additional cultural water becoming available to TOs</p>	Low	CCMA	Dynamic
CEMO2024-37	Reputational	<p>Unexpected rain events can lead to capacity limits at Dolly's Ck Rd crossing being exceeded contributing to flows over the road, and the community perceives (incorrectly) that this creates a safety risks to road users.</p> <p>This may occur during an environmental delivery, however the e-water volume contribution is minor - pre-mitigation risk reflects this</p>	Unlikely	Moderate	Low	<ul style="list-style-type: none"> - Continue attempts to contact LGA to seek upgrade of road crossing - Monitor flows closely and adapt plans as necessary - Include provision in water order for cessation of releases under sudden rain events <p>Need to monitor this issue for compounding impacts of additional cultural water becoming available to TOs Notification to landholders on increased e-water flows might increase reputational</p>	Low	CCMA	Dynamic
CEMO2022-31	Environment	<p>Failure to place an order for summer base flows may lead to cease to flow events, resulting in environmental impacts</p>	Unlikely	Minor	Low	<ul style="list-style-type: none"> - Closely monitor water actions and orders - Check and confirm with CMA prior to stopping base flow events 	Low	CCMA Storage managers	Static

10 APPROVAL, ENDORSEMENT AND CONSENT

WATERWAY MANAGER APPROVAL OF THE SEASONAL WATERING PROPOSAL

I, Amber Clarke the authorised representative of the agency shown below, approve the Seasonal Watering Proposal for the lower Barwon wetlands system in 2024-25.

SIGNED FOR AND ON BEHALF OF Corangamite CATCHMENT MANAGEMENT AUTHORITY

Signature of authorised representative: 

Name of authorised representative: Amber Clarke

Position of authorised representative: CEO

Date: 19 April 2024

ENDORSEMENT OF THE SEASONAL WATERING PROPOSAL

I, the authorised representative of the agency shown below, approve the Seasonal Watering Proposal for the Moorabool system in 2024-25.

Role	Endorsing partner	Representative Role	Status Date	Notes/Comments
Water Corporation	Barwon Water	Jared Scott Coordinator Systems, Water and Catchment	<input checked="" type="checkbox"/> Endorsed. Date: 09/04/2024	<i>Following our review I can confirm that Barwon Water endorses the plan and does not require any changes to be considered in its finalisation.</i>
Traditional Owner	WTOAC	Claire Mennen Project Officer, Caring for Country Team	<input checked="" type="checkbox"/> Endorsed. Date: 23/02/2024	<i>We're both comfortable with the content and have no additional comments to provide.</i>

CONSENT TO USE OF CONTENT

Role	Endorsing partner	Delegate Role	Content	For use in the		Notes
				Seasonal Watering Proposal	Seasonal Watering Plan	
Traditional Owner	WTOAC	Claire Mennen Project Officer, Caring for Country Team	Entire document	<input type="checkbox"/> Consent provided. Date:	<input type="checkbox"/> Consent provided. Date:	<i>This SWP excludes cultural language.</i>

11 REFERENCES

BOM. 2024. Climate Driver Update. <http://www.bom.gov.au/climate/enso/>

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Jacobs, 2015, October 1. *Moorabool River FLOWS Study update*. [Report prepared by Jacobs Australia for the Corangamite CMA]. [_Corangamite CMA Knowledge Base - Moorabool River FLOWS Study Update 2015 \(ccmaknowledgebase.vic.gov.au\)](https://www.ccmaknowledgebase.vic.gov.au)

Sinclair, Knight, Merz (SKM), 2003, Moorabool River Water Resource Assessment, www.ccmaknowledgebase.vic.gov.au/resources/R05_Final_report_d1.pdf