

Wimmera and Glenelg Rivers environmental entitlement: Review of management arrangements

DISCUSSION PAPER

Overview

The Victorian Environmental Water Holder (VEWH) is currently undertaking a review of management arrangements under the shared Wimmera and Glenelg Rivers environmental entitlement, to determine if these arrangements are achieving optimum environmental benefits across the two systems. This action was identified in the *Western Region Sustainable Water Strategy*, stemming from community concerns regarding sharing of environmental water across the Wimmera and Glenelg catchments.

This discussion paper is the first step in the review process, outlining issues that have been identified with the current management approach, and developing a range of options to address these issues.

Issues that have been identified to date include:

- Inequity in the sharing of environmental water between the Wimmera and Glenelg rivers
- Lack of clarity around management arrangements in place in the Wimmera-Glenelg system
- Lack of certainty around multi-year watering

Options identified to address these issues include:

- Splitting the headworks system to provide separate entitlements for the Wimmera and Glenelg source systems
- Splitting the Wimmera and Glenelg Rivers environmental entitlement
- Retaining the existing shared environmental entitlement
- Developing a range of water sharing rules under the shared environmental entitlement

Further details relating to these issues and options can be found in sections 5 and 6 of this discussion paper.

Have your say

The VEWH are seeking written comments on the issues and options identified in this discussion paper. Comments can be made until 5pm on **Friday 16 August 2013**. See section 6 for further information.

Next steps

Targeted community consultation on this discussion paper will be undertaken throughout July and August 2013. Information obtained through this consultation process will then help to inform the preferred management option, which will be presented to the Minister for Water by 30 September 2013.

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1 Introduction

1.1 Purpose of the review

In 2011, the Victorian Government released the *Western Region Sustainable Water Strategy* (WRSWS), a 50-year planning document for the management of water resources in the region. Action 6.8 in this strategy states:

The Victorian Environmental Water Holder (VEWH) will work with Wimmera and Glenelg Hopkins catchment management authorities to achieve the optimum environmental outcomes for flows in each river system through the shared entitlement.

The VEWH will consider the benefits of separating the Wimmera-Glenelg environmental entitlement and the management of the entitlement will be reviewed as part of the broader review of the operation of all bulk entitlements in the Wimmera-Glenelg system.

As part of this action, management arrangements for the use of water available under the *Wimmera and Glenelg Rivers Environmental Entitlement 2010* will be reviewed. The aim is to ensure that management arrangements aid in enabling the efficient and effective use of water available under the entitlement to maximise environmental outcomes, whilst ensuring there are no third party impacts.

This paper forms the first formal step of this review. A range of options will be explored to improve management arrangements. This will include, but is not exclusive to, recommendations around the separation of the Wimmera-Glenelg environmental entitlement.

It is important that stakeholders and the community understand that some issues, though related to the shared nature of the environmental entitlement, are outside the scope of this review, including:

- changes to the Wimmera-Glenelg headworks system
- the management of consumptive water and system operating water, including any inter-basin transfers of water from the Glenelg to the Wimmera

Outcomes of this environmental entitlement management review, including any improvements that may influence broader system management, will then feed into Grampians-Wimmera-Mallee Water's (GMMWater) review of the operations of all bulk and environmental entitlements in the Wimmera-Glenelg system, scheduled for 2013-14.

1.2 Review process

The review process for this project has been divided into two stages:

Stage 1: Issues and options paper (February-August 2013)

This stage will identify the background and key issues in the management of the environmental entitlement in the Wimmera-Glenelg system and identify options to improve its management. This includes issues identified by the catchment management authorities (CMAs), GMMWater, and interested community groups. Key tasks include:

- Develop issues and options discussion paper for consultation (this paper)

- Community consultation, including presentation to interested community groups

Stage 2: Final recommendation (August-September 2013)

This stage will identify the preferred management approach for the Wimmera and Glenelg Rivers environmental entitlement and report this to the Minister for Water (cc: Minister for Environment and Climate Change). Key tasks include:

- Consolidating engagement feedback from Stage 1
- VEWH Commission selecting preferred option
- VEWH presenting preferred option to CMA Boards
- Preferred option presented to the Minister for Water.

1.3 Who is involved in the review?

There are a range of organisations involved in this review, with varying roles and responsibilities.

The VEWH is the independent statutory authority responsible for managing Victoria's environmental water entitlements (Water Holdings). The mission of the VEWH is to manage Victoria's environmental Water Holdings, in cooperation with partners, to improve the environmental health of rivers, wetlands and floodplains. In undertaking its mission, the VEWH:

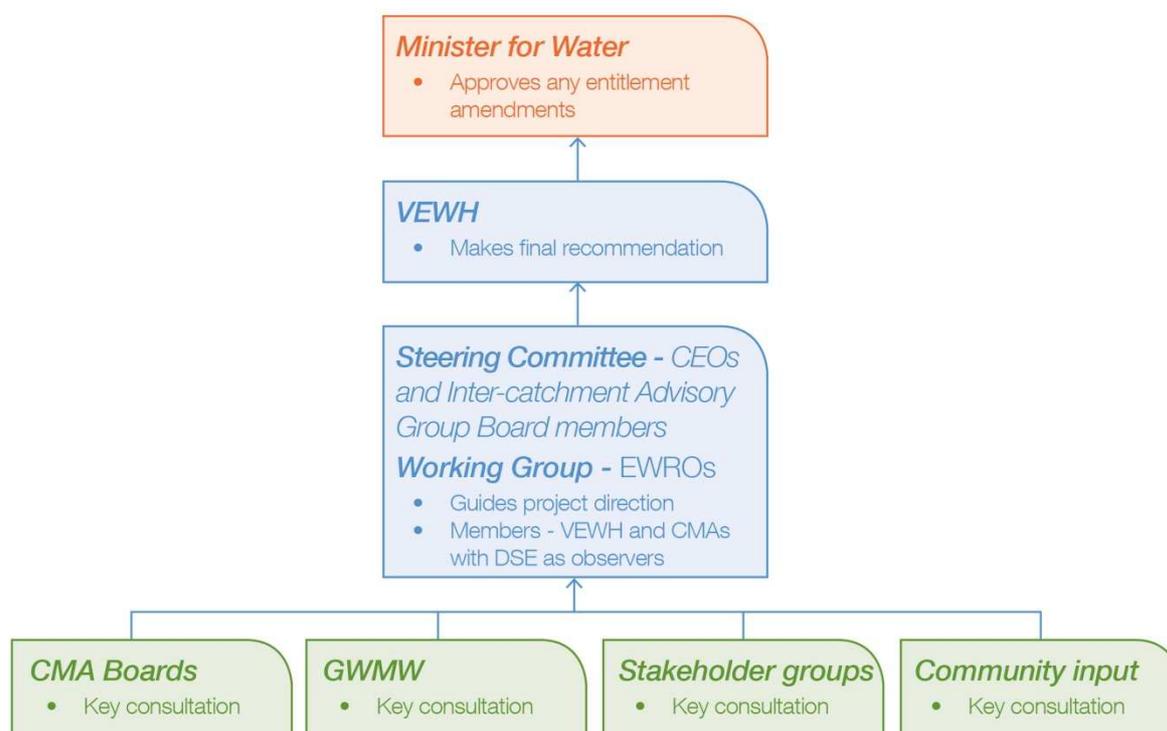
- makes decisions on the most effective use of the Water Holdings, including use, trade and carryover
- authorises waterway managers to implement watering decisions
- liaises with other water holders to ensure coordinated use of all sources of environmental water
- commissions targeted projects to demonstrate ecological outcomes of environmental watering at key sites
- publicly communicates environmental watering decisions and outcomes.

The Glenelg Hopkins and Wimmera CMAs are the waterway managers, responsible for the management of river health, regional and catchment planning, and waterway, floodplain, salinity and water quality management. Waterway managers are the key partners of the VEWH, undertaking the local planning for, implementation of and reporting on environmental watering actions, including consultation with local communities.

The VEWH will coordinate the environmental entitlement management review process, working with the Wimmera and Glenelg Hopkins CMAs to refine options for future management of the environmental entitlement and undertake community consultation. The VEWH will make a recommendation to the Minister for Water on the option that will have the greatest environmental benefit for the Wimmera and Glenelg systems.

The following diagram illustrates the governance arrangements and key partners and stakeholders involved in the project. The steering committee and working groups have been informally established to provide advice to the VEWH at key stages in the project.

Figure 1. Project governance arrangements and key stakeholders



2 Water resources in the Wimmera-Glenelg

The Wimmera-Glenelg headworks system interconnects three major river basins, the Wimmera-Avon, Avoca and Glenelg. The complex system of pipelines and channels in the Wimmera-Glenelg system enables water to be shifted between storages, including from the Glenelg to the Wimmera system.

The Wimmera-Glenelg headworks system, illustrated in Appendix 1, is managed and operated by GMMWater. As the storage manager, GMMWater is responsible for managing the system in line with a range of objectives and rules set by the Minister for Water.

The Glenelg system has two main storages which can capture water from the Glenelg catchment: the Moora Moora and Rocklands reservoirs. Rocklands Reservoir is the largest storage in the Wimmera-Glenelg headworks system and captures inflows from a number of creeks and rivers including the Glenelg River. Moora Moora Reservoir is a relatively small storage in the headwaters of the Glenelg.

Water in the Wimmera system is stored in three on-stream reservoirs: Lake Wartook on the MacKenzie River; Lake Lonsdale on Mount William Creek; and Lake Bellfield on Fyans Creek. Off-stream storages can harvest water via channels from the Wimmera River, Mount William Creek, MacKenzie River, Burnt Creek, Glenelg River (Taylor's Lake) and Fyans Creek (Lake Fyans). Water from Rocklands Reservoir can also be transferred to the Wimmera system via the Rocklands-Toolondo Channel.

2.1 Assessing the impact of river regulation

The impact of river regulation and the construction of the storages outlined above varies depending on the size of storages and their placement in the system. The impact of regulation before and after the completion of the Wimmera-Mallee pipeline for each system is detailed in Appendix 2.

Water storages, river diversions, drought, and other factors such as small farm dams, have greatly impacted on the Wimmera and Glenelg systems. One way of assessing the impact of these factors is analysing the portion of inflows into the catchment that make it to the end of the system.

- The average percentage of flows making it to the end of the Wimmera system is 60%. Between 2000 and 2008 during the drought, this was reduced to 4%.
- The average percentage of flows making it to the end of the Glenelg system is 85%. Between 2000 and 2008 during the drought, this was reduced to 84%.

End of system flows for the Wimmera system are low, due to the drier catchment and smaller contribution of unregulated flows. This impact is greatly heightened during droughts. In comparison, end of system flows for the Glenelg system are relatively high, due to the significant inputs from unregulated streams that enter the system downstream of Rocklands Reservoir.

Though end-of-system flows provide a useful indication of the overall impact of regulation on flows in each system, there are often some parts of the system that are more impacted than others, generally depending upon the location of storages in the system. For example, whilst end-of-system flows are quite high in the Glenelg system, the natural pattern of flows in the reach directly downstream of Rocklands Reservoir has been significantly altered, with the duration and magnitude of high flows significantly lower than natural. This impact lessens with distance due to contributions from unregulated streams.

The introduction of passing flow rules (which require a certain volume of water to be released from storage in line with specific rules) has gone some way to mitigating the impact of river regulation across both the Wimmera and Glenelg systems.

2.2 Delivery constraints

It is important to recognise that whilst rivers need a diverse range of flows to meet the full range of environmental objectives, from baseflows to bankfull flows, there are a range of constraints that may limit the ability to deliver the required flows.

In some cases, these constraints relate to flooding of public and/or private land or infrastructure. The VEWH and waterway managers will not flood private land without the consent of affected landholders. The delivery of higher flows, such as bankfull flows, is therefore not contemplated using environmental water, but may occur naturally.

Environmental water is delivered through existing water delivery infrastructure, the same infrastructure that is used by GWMWater to deliver water to other entitlement holders. There are often limitations associated with the operation of this infrastructure that may influence the ability to deliver environmental water at certain times and rates. These limitations may relate

to the need to share outlet capacity with other entitlement holders, as a result of storage levels, water quality concerns, or other storage management issues.

Wimmera and Glenelg Hopkins CMAs work closely with GWMWater throughout the season to work within delivery constraint to maximise the benefits of environmental releases. However, under some circumstances the factors outlined above may limit the environmental releases that can be made.

2.3 Water recovery in the Wimmera-Glenelg system

Before the construction of the Wimmera-Mallee Pipeline, the Wimmera-Mallee water supply system delivered water to 48 towns via open channels covering about 2.6 million hectares and provided water for stock, domestic and irrigation purposes. The old channel supply system was extremely inefficient, losing up to 85% of the water to seepage and evaporation.

The last 20 years has seen significant changes made to the Wimmera-Mallee system through major modernisation projects. These projects have improved system efficiency and reliability, provided additional growth water for the region, and recovered large volumes of water for the environment. The projects include the:

- Northern Mallee pipeline (completed in 2001), which saved an average of 50,000 ML per year, of which 34,700 ML a year was returned to the Wimmera and Glenelg rivers, as entitlement in storage and through passing flows.
- Wimmera Mallee pipeline (completed in 2011), which saved an average of 103,000 ML per year previously lost from inefficient channels, of which 83,559 ML was returned to the environment, including 69,546 ML for the Wimmera and Glenelg Rivers; 8,480 ML to the Goulburn and Loddon rivers and 5,533 ML to the Avon, Richardson and Avoca Rivers.
- Commonwealth Government water purchase (completed in 2012) of 28,000 ML of former irrigation and associated loss entitlement, recovered to deliver environmental benefits within the Wimmera system, as part of the Murray-Darling Basin Plan.

The completion of the Wimmera-Mallee pipeline and the recent purchase of water by the Commonwealth has dramatically changed the distribution of water for consumptive and environmental purposes, as outlined in the following section.

2.4 Water entitlements in the Wimmera-Glenelg

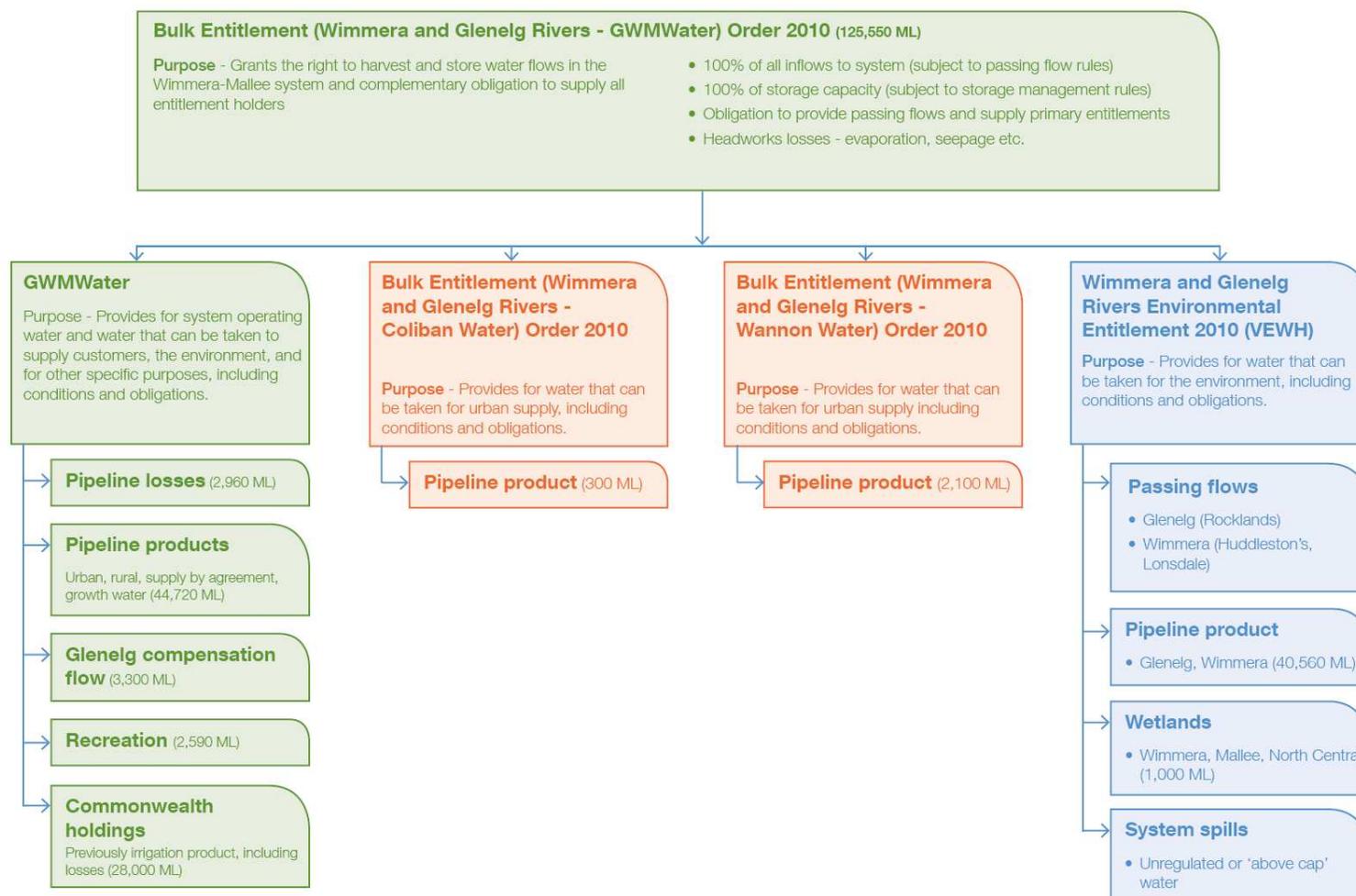
Water entitlements provide entitlement holders the right to store and have water delivered from the supply system. The available water in the Wimmera-Glenelg system is shared between all entitlement holders using an agreed set of rules, specified in all entitlements. Different entitlements are comprised of various water products, with different reliabilities and associated rules.

The source bulk entitlement in the system is held by Grampians-Wimmera-Mallee Water (GWMWater), as resource manager in the Wimmera-Glenelg system. This source entitlement provides GWMWater with water to operate the system and to supply other entitlement holders and customers, in addition to water for recreational and other purposes. A total of three additional bulk and environmental entitlement orders have been granted in

the Wimmera-Glenelg system, held by Coliban Water, Wannon Water, and the VEWH, as outlined in Figure 2.

Entitlements in Wimmera-Glenelg system consist of a range of different water products with varying purposes, volumes and reliability of supply. Entitlements with a high reliability of supply, predominantly pipeline products, are more likely to receive allocations during dry years. Those with a lower reliability of supply, including Commonwealth holdings, recreation water and the wetland component of the environmental entitlement, are more likely to be impacted during dry periods, with less water allocated to them.

Figure 2 – Wimmera-Glenelg entitlement framework



2.5 The Wimmera and Glenelg Rivers Environmental Entitlement 2010

The *Wimmera and Glenelg Rivers Environmental Entitlement 2010* held by the VEWH is made up of water in storage, passing flows and unregulated flows, all of which have varying properties and reliability of supply.

- *40,560 ML of Wimmera-Mallee pipeline product* – entitlement which receives an annual allocation of water held in storage for release when ordered. It has the same reliability as entitlements used to supply towns and rural properties from the Wimmera-Mallee system.
- *1,000 ML of wetlands product* – entitlement which receives an annual allocation (as above). It must be used to supply nominated wetlands formerly supplied by the Wimmera-Mallee channel system. Its reliability is slightly lower than the Wimmera-Mallee pipeline product.
- *Passing flows at a number of locations in the system* – water that must be released from storage to meet target flows at key points in the system as specified in the entitlement, with the volume delivered based on total water availability. The volume of water provided by passing flows is not known in advance because the volume released from storages or weirs varies from day to day, depending on the natural inflows occurring at the time. Passing flow rules were developed based on analysis of historical inflow data. This analysis identified a 60:40 split between the contribution of the Wimmera and Glenelg systems to the shared supply system respectively; that is, on average the Wimmera system contributes 60% and the Glenelg contributes 40%.
- *Unregulated flows* – this water includes natural river flows and spills from harvesting weirs and storages in excess of passing flows. This component of the environmental entitlement has the lowest reliability as it generally requires very wet conditions for it to take place and there is little control over when and where they occur.

2.6 Carryover provisions

Carryover has always been available under the environment entitlement in the Wimmera-Glenelg system, however was introduced to all entitlement holders in 2010. Carryover allows the holders of bulk and environmental entitlements to retain unused allocated water at the end of the season for use in the next season. Carryover provides for opportunistic use of reservoir space when it is not needed to support other entitlements. This water is held in 'spillable water accounts'.

Carryover provides entitlement holders with greater flexibility to hold or use water when it is of the greatest value to their business, and to prepare for shortages during drought.

If there is a spill in certain parts of the headworks system, then water held in spillable water accounts is lost to make way for new allocations to entitlement holders. Due to the shared nature of the Wimmera-Glenelg headworks system, if there was a spill in a storage in one system, carryover will be reduced across the entire headworks system.

These spill rules are what stop carryover water taking up storage space needed for inflows to support new allocations throughout the season. They are critical to ensure that one entitlement holder's carryover does not impact another entitlement holder's reliability of supply.

Any water in the spillable water account that does not spill is made available once GWMWater, as the resource manager, declares a low risk to spill. This occurs when GWMWater is confident that storages will not spill later in the season, and future allocations are unlikely to be affected.

It should be noted that any volumes carried over from one year to the next in the Wimmera-Glenelg system incur a 15% loss to account for annual evaporative losses from the headworks system.

3 Prioritising environmental water use

3.1 Identifying environmental watering requirements

CMAs, in consultation with the community, stakeholders and partners, are responsible for the development of regional waterway strategies. These strategies identify priority rivers, wetlands, and floodplains (assets), value their services (values and uses), and assess the threats and relative risks to these assets. The strategies establish objectives for waterways to assist in determining priority management actions across each CMA region. Regional waterway strategies are currently being reviewed and updated and are due for completion in early 2014.

For waterways identified as long-term priorities for environmental watering, scientific studies into the magnitude, timing, duration and frequency of environmental flows are undertaken (known as environmental flow studies). These studies provide scientific recommendations for the flows required to protect the values of waterways and manage the threats to them. They are used by CMAs to identify annual environmental watering priorities in their seasonal watering proposals.

The scientific flow studies for the Wimmera and Glenelg systems are currently being reviewed and updated based on outcomes from monitoring programs and to reflect key learnings from environmental flow management in recent years. These revised flow studies will help ensure environmental watering actions are effective and efficient in achieving environmental outcomes in both systems.

3.2 Historical prioritisation arrangements in the Wimmera and Glenelg systems

Prior to the establishment of the VEWH, the Wimmera and Glenelg Hopkins CMAs worked together to develop annual watering plans outlining how available environmental water would be shared between the Wimmera and Glenelg systems. These plans were developed by the CMAs, in consultation with an Inter-Catchment Advisory Group (ICAG) and technical working groups, based on a process and set of principles outlined in an environmental operating strategy. The plan was then submitted to the Minister for Environment, as the previous holder of the environmental entitlement.

The principles used to inform sharing arrangements between the systems included: maximising environmental outcomes across the two systems; maintaining flexibility in managing under changing conditions; using best available science to inform decision

making; maintaining effective relationships with the storage manager; being accountable and transparent; and undertaking monitoring, evaluation and reporting.

Table 3 outlines environmental water availability and use across the Wimmera and Glenelg systems from 2007-08 to 2012-13. This data illustrates the variability in water use over time, which provides some indication of the change in demands across the two systems, which may vary substantially depending upon seasonal conditions within and between years.

Table 3. Historical availability and use of environmental water in the Wimmera and Glenelg systems

Water year	Environmental water availability in the Wimmera-Glenelg system (ML)	Glenelg system	Wimmera system	Total
		Water use (ML)		
2007-08 ¹	3,865	0	2,600	2,600
2008-09	11,686	900	500	1,400
2009-10	16,383	3,480	5,940	9,420
2010-11	41,560	10,748	7,065	17,813
2011-12	69,211	3,562	14,183	17,745
2012-13 ²	80,463	18,107	29,174	47,281
Total water use		36,797	59,462	96,259

¹ The environments rights were qualified to secure water supplies for towns in 2007-08, restricting the amount of water available to be used for the environment.

² Environmental water usage in 2012-13 was at 5 June 2013.

It is however important to note that there may have been other factors, such as delivery constraints or issues associated with the timing of water becoming available, that may have influenced the pattern of use.

3.3 Prioritisation arrangements under the Victorian Environmental Water Holder

Decisions about environmental water releases are now made in line with the VEWH's seasonal watering plan, based on seasonal watering proposals developed by waterway managers (CMAs).

Wimmera and Glenelg Hopkins CMAs continue to work closely to develop seasonal watering proposals for their respective systems, outlining environmental objectives, priority watering actions and associated water use options for their respective systems under a range of scenarios.

In determining priority watering actions for each system, Glenelg Hopkins and Wimmera CMAs undertake a review of previous years to identify potential gaps and use a consistent risk-based approach to determine the priority watering actions for coming year. In developing their individual proposals, the two CMAs coordinate to ensure their scenario planning is aligned.

These proposals then inform the VEWH seasonal watering plan which sets the priorities for where, when, how and why environmental water will be used annually across the State. This plan informs decisions made by the VEWH in authorising the CMAs, through seasonal

watering statements, to use water available under the *Wimmera and Glenelg Rivers Environmental Entitlement 2010*.

Decisions regarding the allocation of environmental water between the two systems are made by the VEWH following consultation with both CMAs. Decisions are based on maximising the environmental outcomes across both systems, considering the following criteria:

- extent and significance of the environmental benefit expected from the watering
- certainty of achieving the environmental benefit and ability to manage other threats
- ability to provide ongoing benefits at the site
- water requirements of the site at which the watering is to take place, taking into account watering history at the site and the implications of not watering the site
- risks associated with the watering
- feasibility of the watering action
- overall cost effectiveness of the watering action.

Since the establishment of the VEWH in 2011-12, sufficient environmental water has been available to meet environmental demands in both the Wimmera and Glenelg systems. This has meant that no formal prioritisation between systems has been required.

In a situation when a shortage of water is identified, the VEWH will work closely with CMAs in applying the criteria outlined above and prioritising the use of available water to maximise environmental outcomes across the two systems.

It is important to note that this prioritisation is based on the environmental benefits expected, and not on the nominal 60:40 contribution that the Wimmera and Glenelg systems provide to the overall system resource.

4 Issues identified with management of environmental water in the Wimmera and Glenelg systems

Environmental water has been managed in the Wimmera-Glenelg system since 2004, providing significant benefits to both systems over this period. The delivery of environmental water was critical in protecting threatened native fish populations from increasing salinity in the Glenelg River, maintaining water quality in permanent pools for fish in the Wimmera system, and supporting severely stressed fringing river red gum communities during the recent prolonged drought.

Throughout this time there have been a number of significant changes affecting both systems including: the completion of major irrigation modernisation projects and associated water recovery; significant new water entitlements for the environment; transitioning from prolonged drought to floods and high water availability; new science in relation to environmental water management; new water holders (VEWH and the Commonwealth Environmental Water Holder (CEWH)); and a new management framework through the

creation of the VEWH. In this respect, environmental water management in the Wimmera-Glenelg is in its early stages and continuing to evolve.

This review does however provide an opportunity to assess management arrangements over recent years and identify any issues, and potential refinements that can be made to improve these arrangements.

The following sections outline issues that have been identified to date by interested community groups, CMAs, the VEWH, and GMMWater in relation to management arrangements for environmental water available in the Wimmera-Glenelg system.

4.1 Inequity in environmental water sharing between the Wimmera and Glenelg

There is a perceived inequity in sharing arrangements for environmental water between the two systems, with some concern particularly from the Glenelg community, that their system is not getting its fair share of water. This stems from issues in relation to:

- the perceived arbitrary decisions on the allocation of environmental water based on proportions and ratios (60:40) rather than the environmental water needs of each system
- one-way inter-basin transfers of water from Rocklands Reservoir and Moora Moora Reservoir to supply the Wimmera system and the dependence of the Glenelg River supply on Rocklands Reservoir
- the ability for water committed in one system to be lost as a result of storage spills in the other system.

4.2 Lack of clarity around water management arrangements

Water management in the Wimmera-Glenelg is highly complex, encompassing a wide geographic area, multiple storages, and a range of entitlement holders and stakeholders.

In understanding environmental water management issues, it is important to first have a clear understanding of the system and how it currently operates. Also important is understanding the key roles and responsibilities of delivery partners in regards to environmental water management in the Wimmera-Glenelg.

There is a need to clarify arrangements in place regarding:

- annual environmental water decision making and environmental water sharing between the Wimmera and Glenelg rivers
- roles and responsibilities of the VEWH, Glenelg Hopkins CMA, Wimmera CMA, GMMWater and the CEWH with regard to planning for and managing the use of environmental water
- coordination between catchments in planning for and managing environmental water (including historical involvement of the Inter-Catchment Advisory Group or ICAG)
- storage management obligations and associated rules
- the impact of physical constraints on the ability to deliver water (including flooding and infrastructure constraints).

4.3 Lack of certainty around multi-year watering

Environmental water management in the Wimmera and Glenelg systems has been undertaken on an annual basis, with environmental water availability being reassessed at the start of each year.

As a result, there is some degree of uncertainty in regard to water sharing and availability in the coming year. There is perceived to be a lack of incentive to increase efficiency in environmental water use, as any unused water is pooled at the end of the water year and reallocated between systems for use in the following year.

4.4 Other areas of uncertainty

The Commonwealth Government recently purchased the 28,000 ML former irrigation entitlement in the Wimmera-Mallee supply system. However, there is some uncertainty around demand patterns for this water and where this water will be sourced to meet demands.

VEWH will continue to work with the CEWH, Wimmera CMA and GWMWater in the coming months to determine arrangements for the use of this water to maximise environmental outcomes. For now, the Wimmera CMA are including potential availability of this water in their seasonal watering proposal for 2013-14.

5 Options for improving management arrangements under the Wimmera and Glenelg Rivers environmental entitlement

There are a number of ways in which arrangements associated with environmental water management in the Wimmera and Glenelg systems can be modified to help achieve the greatest environmental benefits for both systems. These options include a range of management, organisational, and communication options; these are identified and explored below.

Clarifying roles and responsibilities in relation to environmental water management in the Wimmera-Glenelg system is an important component of each of the options. This includes documenting and communicating the roles and responsibilities of the key partners (Glenelg Hopkins CMA, Wimmera CMA, VEWH, GWMWater and the CEWH) with regard to planning for, sharing, and managing the delivery of environmental water. This will be captured in operating arrangements, due for review in 2013-14.

5.1 Option 1. Splitting the headworks system to provide separate entitlements for the Wimmera and Glenelg source systems

Due to the shared nature of the Wimmera-Glenelg water supply system, this type of split would require the entire water supply system and entitlement framework in the Wimmera-Glenelg to be thoroughly reviewed. It could not be done solely for the environmental entitlement.

Splitting the Wimmera-Glenelg headworks system is therefore not within scope of this review, but options such as this, regarding broader system management may be

incorporated into GWMWater's review of bulk and environmental entitlement operations, scheduled for 2013-14.

5.2 Option 2. Splitting the Wimmera and Glenelg Rivers environmental entitlement

This option involves splitting the environmental entitlement to create two new environmental entitlements, one for the Wimmera River and one for the Glenelg River, each with a set entitlement volume. The set volume for each system would need to be equitably determined. For example, if the entitlement was split in equal portions, the Glenelg River entitlement would consist of 20,280 ML of pipeline product and the Wimmera River entitlement would consist of 20,280 ML of pipeline product.

This option would not affect how allocations are made across the shared headworks system. Allocations to both the Wimmera River and Glenelg River environmental entitlements would be made in line with existing water allocation rules, which are consistently applied across all bulk and environmental entitlements in the Wimmera-Glenelg system. These rules are based on resource availability across both catchments, meaning that water availability in each system remains linked to the resource position across the entire system. Allocations increase during the season as inflows occur to storages across the system.

Splitting the environmental entitlement would provide greater certainty of water availability to each system. This would likely help to address concerns around inequity of environmental water sharing between the systems, provided a 'fair' proportion could be determined. However, it would be difficult to determine a 'fair' proportion, which is acceptable to stakeholders and ensures priority watering actions can be achieved.

Under separate entitlements, any environmental water that was not used in the current year could be carried over into the next year for use in the same system. This would provide greater certainty in planning for environmental water use in each individual system, and encourage efficient use of environmental water. However, due to the shared nature of the allocation system in the Wimmera-Glenelg, any water carried over in one system would still be subject to the spill rules across the Wimmera-Glenelg headworks system. If a spill is deemed to have occurred in the headworks system (regardless of water levels in individual storages), water would be lost proportionally across all entitlement holders.

In implementing this option, the physical source of the environmental water would remain unchanged, meaning inter-basin transfers of environmental water would still occur. Similarly the management of the headworks system, including inter-basin transfers from Rocklands Reservoir to the Wimmera system, would still occur as required to meet consumptive demand and system operation objectives across the Wimmera-Glenelg system. As outlined in Option 1, the only way in which the systems could operate independently of each other is if the headworks system was split, which is not within scope of this review.

It is currently unclear whether there may be potential implications of splitting the entitlement under the Murray-Darling Basin Plan, as a result of sustainable diversion limits set for the Wimmera system. The potential implications of this need to be explored prior to any change being made to the environmental entitlement.

5.3 Option 3. Retaining the existing arrangements

Retaining the existing entitlement for the Wimmera and Glenelg rivers provides a significant degree of flexibility in using available water to maximise environmental outcomes across both systems under changing conditions. This is a similar situation to what occurs in the highly connected systems of northern Victoria.

In the past two years, the development of a joint seasonal watering proposal for the Wimmera and Glenelg systems placed significant administrative burden on CMAs. This involved both CMA Boards being required to approve a joint proposal. To streamline the approval process, seasonal watering proposals are now being developed individually for each system, whilst retaining a consistent scenario planning and risk-based approach to prioritising watering actions. This reflects the shared nature of the Wimmera-Glenelg supply system and the need to equitably and consistently assess environmental needs.

The VEWH will implement a consistent approach in making decisions on the sharing of environmental water between the Wimmera and Glenelg systems based on achieving the greatest environmental benefit across the systems. This will include an assessment against the VEWH's prioritisation criteria.

Retaining the existing arrangements does not address the issues described in section 5.

5.4 Option 4. Development of water sharing rules under the existing shared environmental entitlement

Increasing certainty around water sharing arrangements in the Wimmera and Glenelg systems could be achieved by developing water sharing rules to guide annual allocation decisions. These rules could include determining the minimum water requirement of each system to meet critical environmental needs, and locking this away for each system under a set of water sharing rules. This would provide certainty to each CMA on the base amount of water each system can access every year (subject to allocations), to assist in the planning process.

The remaining water, above what is required to meet critical environmental needs, could be used to achieve the greatest environmental benefit within the two systems. This may vary from year to year depending upon seasonal conditions and other factors. Prioritisation of the remaining water would be made by the VEWH in consultation with CMAs, based on the priorities identified in seasonal watering proposals developed annually for the Wimmera and Glenelg systems.

The development of water sharing rules between catchments could also extend to management of carryover, to increase certainty and aid in planning for environmental water use in future years. These rules could consider locking away any unused water that was allocated in one system for use in the same system in the following year, subject to evaporative losses and any losses to spill. As outlined in Option 2, losses to spill and availability of carryover under this option will also be subject to existing rules across the headworks system.

This approach provides certainty to CMAs, and also retains flexibility to meet the highest environmental needs within the two catchments. The outcome of this option would be similar to the option of formally splitting the entitlement, however retains a significant degree of

flexibility to achieve the highest environmental benefit under a range of seasonal conditions within and between years.

It is important to note that GMMWater's broader review of operations may also result in improvements to storage management and operations that may provide greater flexibility and certainty in managing water available under the environmental entitlement. For example, making changes to allocation processes, through defining available water for each entitlement holder in individual or system storages, could be progressed through this process.

6 Have your say

This discussion paper provides an opportunity for the community to provide feedback on the issues and options for improving the management of environmental water to achieve the greatest environmental benefits in the Wimmera and Glenelg systems.

Written comments are sought in relation to the issues and options contained in this discussion paper, which will then help guide the final recommendation on the preferred management approach, to be made to the Minister for Water (late September 2013).

Please make your comments by 5pm on **Friday 16 August 2013** by post or email to:

Victorian Environmental Water Holder
PO Box 500
East Melbourne VIC 3002
Email: general.enquiries@vewh.vic.gov.au

Please note: The information you provide in your submission, or any other response, will be used by the VEWH to inform the recommendation on the preferred management approach for environmental water in the Wimmera and Glenelg systems only. However it may be disclosed to other relevant agencies as part of the overall consultation process.

6.1 Next steps

- Targeted community consultation on issues and options paper until 16 August 2013.
- Consolidate information from the consultation process and present the VEWH's preferred option to CMA Boards in September 2013.
- Preferred presented to the Minister for Water by 30 September 2013.

APPENDICES

Appendix 1. The Wimmera-Glenelg headworks system



Appendix 2. The Wimmera-Glenelg system

Table 1. Impact of river regulation in the Wimmera-Glenelg system

Glenelg River downstream of Rocklands Reservoir	
<i>Pre-pipeline</i>	<i>Post-pipeline</i>
<ul style="list-style-type: none"> The largest impact of river regulation on the Glenelg River is immediately downstream of Rocklands Reservoir to Fullhams Bridge (approximately 12.5km) and decreases with distance as tributary inflows enter the system. <p>General impacts include:</p> <ul style="list-style-type: none"> Natural annual cycle of high and low flows downstream of Rocklands Reservoir had disappeared. Duration and magnitude of high flows were significantly less than natural. Only the occasional spill occurred during the winter/spring months. Summer freshes disappeared as they were captured by the reservoir. Flood frequency was reduced. 	<ul style="list-style-type: none"> The new passing flows downstream of Rocklands have reinstated winter and spring baseflows, decreasing the impact of Rocklands on the upper reaches. However, in dry years, passing flow requirements are reduced, resulting in lower flow rates directly downstream of Rocklands Reservoir. Rocklands Reservoir continues to capture high flow events.
Wannon River	
<i>Pre-pipeline</i>	<i>Post-pipeline</i>
<ul style="list-style-type: none"> Approximately 25% of the upper Wannon River inflows could be diverted into the Wimmera-Glenelg water supply system at any time during the year, putting particular stress on summer low flows critical for maintaining habitat. 	<ul style="list-style-type: none"> Diversions from the Wannon River are now restricted so water can only be taken during the November to May period, protecting critical summer baseflows.
Wimmera River	
<i>Pre-pipeline</i>	<i>Post-pipeline</i>
<ul style="list-style-type: none"> Low and medium flows were captured by the diversions at Huddleston's and Glenorchy weirs; large flows (greater than 1,600 ML a day) were not able to be captured. 	<ul style="list-style-type: none"> Return of a proportion of low and medium flows via passing flows. However, in dry years, passing flow requirements are reduced.
MacKenzie River	
<i>Pre-pipeline</i>	<i>Post-pipeline</i>
<ul style="list-style-type: none"> Lake Wartook effectively captured all inflows from the upper MacKenzie. Catchment run-off downstream of Wartook was diverted from the lower MacKenzie River which meant that the river was fully regulated with no flows besides regulated environmental releases or flood flows. The Burnt and Bungalally creeks were also impacted by regulation on the MacKenzie River. 	<ul style="list-style-type: none"> Regulated environmental releases continue to be the only water available to meet environmental objectives in the lower MacKenzie River, Burnt and Bungalally creeks.
Mount William Creek	
<i>Pre-pipeline</i>	<i>Post-pipeline</i>
<ul style="list-style-type: none"> Lake Lonsdale harvested all flows from the Mt William Creek, apart from occasional large flood events and when the lake was full. 	<ul style="list-style-type: none"> Passing flow rules in winter/spring mean that a proportion of baseflows are now returned to the Mt William Creek. However, reduced operating levels in Lake Lonsdale mean that there will be a reduced frequency of high flows.