



Independent advice on the  
management of the Commonwealth  
water holdings in the Goulburn  
catchment

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# Executive summary

The Commonwealth Environmental Water Office (CEWO) has engaged Marsden Jacob Associates to provide analysis and advice that contributes to more optimal management of Commonwealth environmental water holdings. In particular, the analysis and advice focus on the Goulburn catchment and consideration of the potential to implement sets of portfolio management options available to the CEWH to help manage the impacts of constraints and to protect and restore environmental assets in the Murray–Darling Basin (MDB).

## The Goulburn catchment

The Goulburn catchment is part of the broader Victorian river system in the MDB, including the Broken, Campaspe, Loddon, Ovens and Wimmera catchments.

Commonwealth water holdings in the Goulburn system include both high and low reliability water shares (Table 1). Recent changes in the rules governing trades from the Goulburn to the Murray have changed the capacity to transfer water allocations against those licences. This has affected the use of the Commonwealth’s Goulburn holdings in both the Goulburn and the southern connected MDB more generally.

The trade rule changes stem from the significant change in water use across the southern MDB in recent years: the Goulburn catchment is increasingly a net seller to irrigators downstream of the Barmah Choke.

Table 1: Commonwealth water holdings in the Goulburn catchment

Security	Registered entitlements (GL)	Long-term average annual yield (GL)
High reliability	318.56	308.05
Low reliability	42.47	24.76
<b>Total</b>	<b>361.02</b>	<b>332.80</b>

Source: CEWO, Marsden Jacob analysis.

## Constraints are affecting the environmental water holders

Demands for environmental water in the Goulburn Valley are usually high. The Commonwealth’s current entitlement portfolio in the valley would help to meet those demands if the annual allocations available to those entitlements were able to be delivered without constraints.

Several constraints are affecting the ability of the Commonwealth Environmental Water Holder (CEWH) and the Victorian Environmental Water Holder (VEWH) to use held water for environmental purposes in the Goulburn catchment.

The constraints are reducing flexibility and leading to the accumulation of high volumes of carryover water during wet periods.

## Four key constraints affect water delivery for environmental outcomes

The delivery and use of Commonwealth environmental water is based on environmental needs and varies from year to year with the prevailing seasonal, operational and management conditions. Flow constraints fall into three categories (physical, management and operational), which affect the CEWH's ability to use its water portfolio to achieve environmental outcomes in the Goulburn catchment. The key constraints on the volume and timing of water delivery for environmental outcomes in the catchment are:

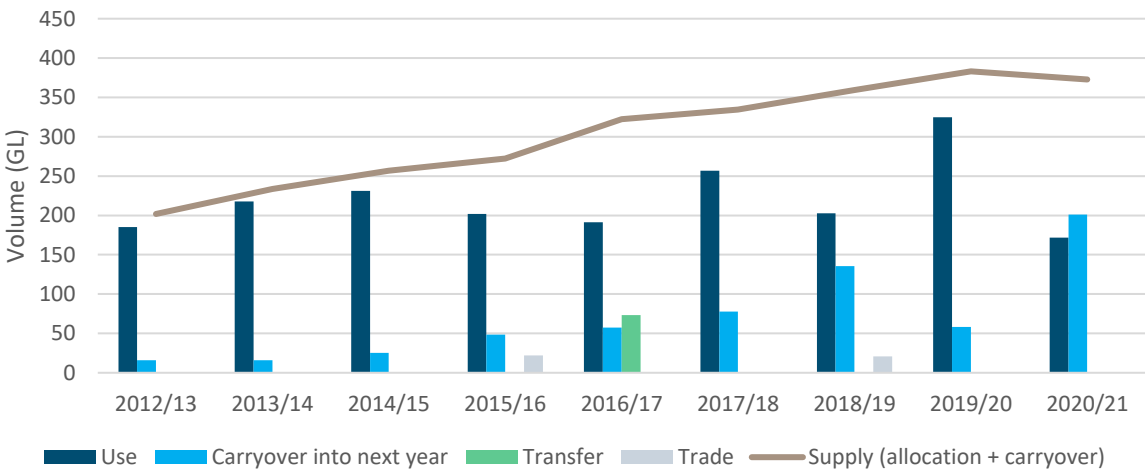
1. the Goulburn to Murray inter-valley transfer (IVT) trade rule, which is likely to be restricting the delivery of environmental water from September to June in all but wet years
2. the Goulburn to Murray IVT operating rule, which is likely to be restricting the delivery of environmental water from September to June
3. the potential for infrastructure inundation, particularly private diverter pumps, at any time of year but particularly during spring and autumn
4. the year-round maximum Lake Eildon release limit.

## Commonwealth carryover volumes can increase rapidly from one year to the next, and the constraints are exacerbating this issue

The four key constraints affect how much and when the CEWO can deliver water in the Goulburn and downstream catchments. The problem is that the volume of Commonwealth carryover can increase rapidly should there be high water availability and relatively low environmental demand (Figure 1), or relatively low opportunity to deliver water to meet environmental demand.

While the Commonwealth is not the majority holder of entitlements in the Goulburn catchment, it does hold a substantial volume relative to others. The holdings that the CEWH manages represent about 22% (360 GL over 1,600 GL) of low and high reliability entitlements on issue in the Goulburn–Broken catchment. Because the CEWH is the largest combined holder, portfolio actions that lead to substantial carryover volumes may influence or be perceived to influence the risk of spill determinations.

Figure 1: Commonwealth allocation volumes associated with historical portfolio management options overlaid with the total supply, 2012–13 to 2020–21 (GL)



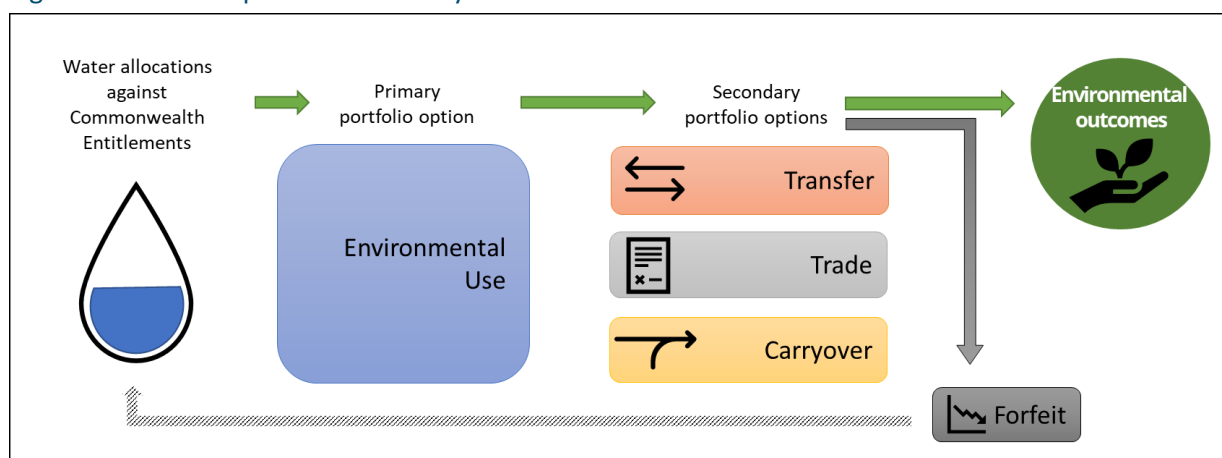
Source: CEWO, Marsden Jacob analysis.

Entitlement holders can carry over a maximum value equal to the water share linked to their allocation account (up to 100% of their high and low reliability water shares) in the Goulburn system. When announced allocations are greater than 0%, entitlement holders may have more than 100% of their total entitlement volume on their allocation accounts. If that happens, water in excess of 100% of the entitlement volume is quarantined in a spillable water account until the Victorian Natural Resource Manager declares a low risk of spill and may be lost if the dam overflows following a spill determination. Notably, Lake Eildon has spilt twice since the 2010–11 water year, and the risk of a spill occurring tends to be higher when there is a high level of carryover in the system.

**Constraints are reducing the flexibility of the CEWH’s portfolio management options**

There are multiple paths by which the CEWO can manage water through portfolio management options: use, transfer, carryover or trade (Figure 2) to protect and restore environmental assets and achieve environmental outcomes. The general approach is that use to meet current environmental demands is considered as first priority, followed by the second grouping of transfer, trade, and carryover. A less desirable option is to forfeit an allocation. The constraints seriously reduce the CEWH’s opportunities to use, trade and transfer, resulting in significant carryover balances.

Figure 2: CEWO portfolio hierarchy



Source: Marsden Jacob

While historically the CEWH’s focus on trade has been relatively low (see Table 2), the impact of constraints means that greater environmental outcomes may be achieved from the Commonwealth environmental water holdings from an increased focus on water trading. The funding raised from trade could be used to support subsequent actions, such as purchasing water or environmental activities either in the Goulburn or in other catchments, that would not be possible otherwise. And, while spills also support environmental outcomes, they commonly occur when the environment is well provided for in the local catchment, so trading and deployment towards priority environmental outcomes will be likely to yield more significant environmental benefits.

Table 2: Available portfolio management options

Portfolio option	Description	Information consideration	Historical use
Use	Water allocations are delivered to environmental targets in the Goulburn and downstream if possible. Water management plans primarily lead to the delivery of environmental water.	<ul style="list-style-type: none"> <li>• Environmental demands</li> <li>• Water availability</li> <li>• Allocation forecasts</li> <li>• Physical, management and operational constraints</li> </ul>	High
Transfer	Water is transferred to another catchment for delivery, carryover or trade.	<ul style="list-style-type: none"> <li>• Environmental demands</li> <li>• IVT trade balance</li> </ul>	Low
Carryover	Water is carried over into the next water year.	<ul style="list-style-type: none"> <li>• Timing of environmental demands</li> <li>• Water availability</li> <li>• Allocation forecasts</li> <li>• Carryover limits</li> </ul>	High
Trade: sell	Water is sold on the water market, and the funds are used to purchase allocation.	<ul style="list-style-type: none"> <li>• IVT trade balance</li> <li>• Trade impact</li> </ul>	Low
Trade: sell	Water is sold on the water market, and the funds are used to fund environmental activities.	<ul style="list-style-type: none"> <li>• Water market outlook</li> <li>• Trade funding options</li> </ul>	Low

Portfolio option	Description	Information consideration	Historical use
Trade: buy	Water is purchased to meet environmental demands.	<ul style="list-style-type: none"> <li>• CEWO Environmental Activities Framework</li> </ul>	Not used
Forfeit	Unused water that cannot be carried over remains in storage and contributes to allocation determinations in the new water year.	<ul style="list-style-type: none"> <li>• Water availability</li> <li>• Allocation forecasts</li> <li>• Carryover limits</li> </ul>	Not used

Source: CEWO, Marsden Jacob analysis.

### The predictability of the constraints varies

While the *timing* of potential constraints can be predicted (the constraints are typically most pronounced over the peak water periods for irrigated agriculture), it is difficult to predict the *impact* that the constraints will have.

For instance, for the Goulburn to Murray IVT trade constraint, the operating plan for the delivery of water from the Goulburn IVT account<sup>1</sup> includes a default delivery pattern that shows how IVT water is expected to be delivered under average conditions, enabling the equivalent amount of trade opportunity. But average conditions are rarely seen, and the actual volumes depend on catchment conditions.

Thus the default IVT delivery pattern gives only an indication of the potential trade opportunity during the first half of the season. There is also an issue at the moment with lack of timely information from the Victorian Department of Environment, Land, Water and Planning about the volume, timing and likelihood of IVT demand or a particular IVT delivery.

### There are opportunities to more actively trade CEWH allocations

#### Water availability, agricultural production and water market activity information can guide the optimal timing for water trading

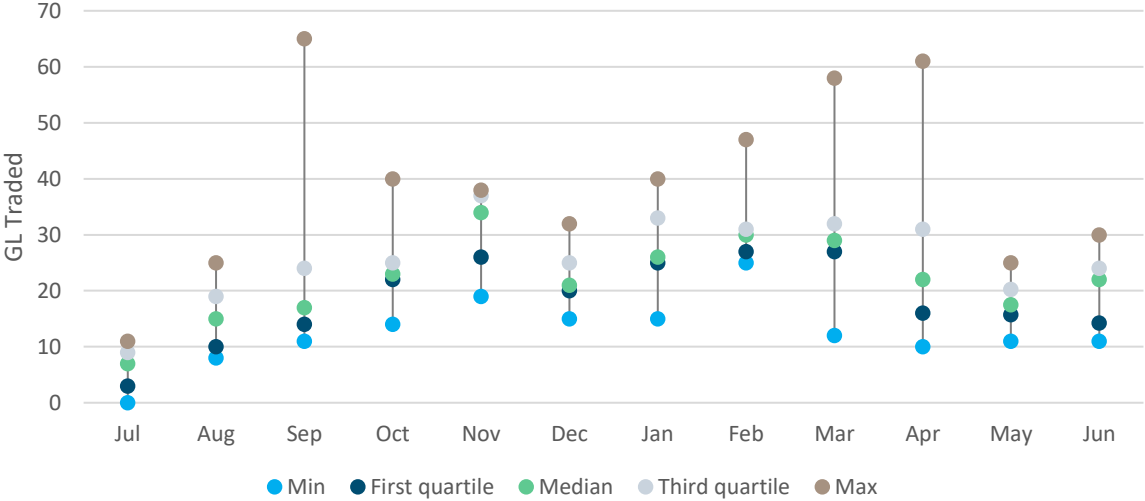
When undertaking a trade, current and future water allocation expectations are a key consideration. Generally, water entitlement holders in the Goulburn system receive relatively high allocations to high reliability entitlements, potentially reducing the chance of environmental water shortfalls in the Goulburn caused by overselling allocations. The CEWH may also consider committing only to small trading volumes or not trading at all in years that are expected to be dry, for example when El Niño events are predicted. Conversely, consecutive La Niña events offer increased water in storage and an opportunity to sell larger volumes, although possibly at a lower price.

Assessments of the optimal times to sell allocations in the Goulburn need to take into account agricultural production systems' variation in water use. From our analysis of both market depth and prices to maximise sales returns, late spring to early summer is generally the best time to trade, as

<sup>1</sup> Department of Environment, Land, Water and Planning (DELWP), *Operating plan for delivery of water from the Goulburn IVT account 2021–22*, Victorian Government, 2021, [online](#).

there is typically a more liquid market from multiple cropping sources in mid-summer, and prices tend to also be higher at that time (Figure 3). Late spring to early summer is also typically when maximum allocations in the Goulburn system are known, providing irrigators with an understanding of their maximum water availability and whether they need additional water. The water market activity in the Goulburn also follows agricultural production demand, and that means that spring and summer are when peak prices and traded volumes occur, on average.

Figure 3: Volume traded by month, 2013–14 to 2021–22 (GL)



Note: The volumes in this figure represent trades from Zone 1A (Greater Goulburn) alone, and do not account for market connectivity. When there is greater market connectivity, such as when Goulburn to Murray trade is open, the market size can be far greater (see Table 14 for more details).

Source: Marsden Jacob analysis

Trading could be employed as a measure to mitigate the risk of forfeiting held allocation in the event of a spill occurring. Furthermore, our analysis also found that, based on a review of historical use and allocations in all but the driest of years, it would have been possible for the CEWH to trade up to 40 GL/year in the Goulburn system<sup>2</sup> without compromising environmental objectives if the timing of trade had been optimised to ensure that there was water available for use when needed. In wet years, such as 2016–17 or 2021–22, the additional trade volumes could have been much greater than 40 GL without significantly affecting the net position.

This confirms that in the future the CEWH could trade sizeable volumes of water and so, rather than a once-off sale, we instead recommend that the water be progressively sold through the spring and summer months in several tranches. This requires the establishment of a more active trading process.

One important benefit of this approach is that it means that the CEWH does not have to commit all of its water to sale at one time, there is an opportunity to adapt as the season unfolds. It is

<sup>2</sup> A high-level scenario analysis was undertaken in which the base case (actual water account balances in the years from 2016 to 2022) was compared to trade scenarios in which the CEWH traded additional volumes from 10 GL to 60 GL in the Goulburn. If 2019–20 is excluded (being the only very dry year within the study period), our analysis found that up to 40GL could have been traded in the catchment without compromising environmental objectives.



impossible to predict climate conditions with high levels of certainty, so a progressive sale strategy means that the trading strategy could be adjusted in response if climatic conditions shift (become wetter or drier). It would also have a reduced market impact.

### There is an opportunity for the CEWH to investigate using intermediaries to facilitate trade

The current trading arrangements used by the CEWO (that is, a tender) make it challenging to be an active market participant because of the time taken to complete a trade activity. While a tender approach to a market is consistent with how the government works in many markets when delivering many programs, that approach is unusual in the water market. Additionally, while the impact of the CEWO's existing approach is limited, some impacts would not occur if the CEWO were to work through more established market mechanisms. The delay potentially introduces several reputational and financial risks. For example, when the CEWH announces trade intentions, observed behavioural shifts could be seen in the market because of the uncertainty and time taken to execute a trade.

In Marsden Jacob's opinion, if the CEWO is going to sell more water and interact more frequently with the market, either prequalification or standing agreements with a set of water market intermediaries (brokers and water exchanges) should be considered. The other environmental water holders are already using both approaches successfully, although they have considerably smaller volumes of water to sell.

There may be some issues that would need to be specifically worked through, with input from legal and procurement areas, so that the CEWO can be confident that it could use market mechanisms other than tenders and meet legislative requirements. However, enquiries undertaken for this project with state government environmental water holders and water market intermediaries suggest that it is possible for both exchanges and brokers to support trading actions in a manner that is compliant with the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and obligations under the *Water Act 2007*. In particular:

- **Delegations:** Where delegations<sup>3</sup> are concerned, it is possible for the intermediaries to identify counterparties to sell orders and bring them to the CEWO for authorisation ahead of trades being lodged. The government's authorised delegate would then approve ahead of the trade being lodged, so the delegations would remain compliant with the legislation, particularly section 117 of the Water Act.
- **Transparency:** Market transparency can be achieved by declaring on the CEWO website that water is being made available for sale and which intermediaries have been selected to support the trades.

A further benefit of this approach is its administrative simplicity. A small team, potentially even a single staff member (as is the case in NSW), could manage the selected intermediaries, support the identification of trade opportunities and bring those sales to the delegate to authorise.

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<sup>3</sup> Office of the Australian Information Commissioner, *Financial delegations and authorisations*, Australian Government, 29 March 2021, [online](#).

If this approach is to be implemented, the Commonwealth Water Trading Framework will need to be updated, and standing arrangements should ideally be established with service providers so that they can be engaged promptly when decisions to trade water are taken.

This approach is suggested because it could increase the agility with which the CEWO engages with the market, maintain market transparency and integrity, and bring trade processes into line with those of other environmental water holders and other major water holders across the MDB. It would also mean that the market engagement is better aligned with all other market participants.

### Current portfolio planning could be extended to include trading as a core component

There is no ability to predict water availability and constraints measures with absolute certainty, and the risk is that criticism informed by hindsight will emerge. To address this risk, it is proposed that the portfolio management planning framework defined in Section 5 of this report be systematically implemented to consider all options available to the CEWH when managing and planning Commonwealth environmental water holdings (use, transfer, carryover, trade) and to balance decisions based on the available information.

The decisions that are taken would be documented and available for future review. This would serve to proactively identify trade opportunities, to provide an evidence base showing why decisions were taken and to support the implementation of a continuous improvement process.

### Constraints are leading to consumptive use being prioritised over environmental use

The certainty of delivery for consumptive users seems to be increasing, whereas the certainty for environmental water holders is declining both within the Goulburn Valley and for downstream environmental demands (Victorian and South Australian assets), and the value of environmental water return flows is at least uncertain and possibly not available.

The operating rules for the Lower Goulburn appear to prioritise consumptive users over environmental users. The rules state:

*Regulated flows include all water released to first meet passing flow commitments, then IVT deliveries and then environmental water orders (including Goulburn Water Quality reserve).*

It appears that the delivery capacity of the river is being prioritised towards consumptive users over the holders of environmental water. This is despite the held environmental water having been acquired from irrigators and the requirement that the CEWH be treated equally. As things stand (purchasing the water and transferring it from an irrigator to an environmental water holder while the reliability is being maintained and the fees and charges are being paid), the ability to use the water is being impeded.

## Recommendations

Based on our analysis, we make the following recommendations for consideration by the CEWO. The first three are short-term opportunities to support the CEWO to more actively and frequently engage with water markets. The next three are longer term opportunities that could be supported with the funding that is raised from trading water and could also help to reduce the impact of constraints on environmental water holders.

### Recommendation 1: Water market data and historical portfolio use indicate that the CEWO should trade more frequently each year from late spring to early autumn.

We recommend that the CEWO become a more active participant in the water market, in probably all but very dry years. By selling allocations, the CEWH will have access to additional financial resources that can be deployed to support the achievement of environmental outcomes.

As we have discussed, our high-level scenario analysis comparing trade scenarios involving various volumes from 10 GL to 60 GL that the CEWO traded annually in the Goulburn found that, when 2019–20 is excluded (that being the only very dry year within the study period), up to 40 GL/year could have been traded in the catchment without compromising environmental objectives. In fact, the proceeds of such sales, which would be usually in the range of \$4 million to \$8 million per year but could be more like \$1 million in very wet years, could be invested in environmental activities in the Goulburn catchment as well as more broadly across the MDB.

### Recommendation 2: The CEWO should be more active in its trade actions by engaging the services of water market intermediaries.

The tender approach to the market is consistent with the way governments implement many programs, but is not very consistent with the way the water market functions. The CEWH could adopt a more flexible portfolio planning framework to enable more active consideration of factors associated with trading environmental water.

For example, the CEWO could consider establishing prequalification (panel) or standing agreement arrangements for exchanges and brokers when updating the water trading framework. That will make it possible to readily source the required expertise to support more frequent trading.

The proposed changes will need to be structured to ensure that they are compliant with Australian Government procurement rules and requirements and will require certain safeguards to reduce conflicts of interest. However, those issues are already being effectively managed for other environmental water holders, so this is well-trodden ground.

For instance, we understand that the NSW Department of Planning and Environment currently uses a range of water exchange platforms and brokers and can execute trades without delegating.

The VEWH has also engaged multiple market intermediaries, to support its sale of environmental allocation and has been open for new entrants to facilitate trades if they fulfil the selection criteria. Marsden Jacob also thinks that having Australian Water Brokers Association (AWBA) membership as

part of those criteria has also been very beneficial for the AWBA because it means that the intermediaries have agreed to adhere to a code of conduct.<sup>4</sup> Both VEWH and NSW mainly use AWBA members with a majority of water market intermediaries being AWBA members due to the relatively small size of the industry.

### Recommendation 3: Strengthen working relationships with state environmental water holders when undertaking portfolio planning activities.

The CEWH works collaboratively with the VEWH in regard to environmental water use. The CEWO could engage and work collaboratively with state environmental water holders to align portfolio planning activities to achieve the best environmental outcomes possible.

To benefit outcomes in the Goulburn Valley, a portfolio planning working group including the CEWO and the VEWH could be beneficial. The working group could lead to increased information sharing on all portfolio options, including trade considerations. The environmental water holders have a common objective and are clearly already working together towards the achievement of that objective, but the level of discussion on portfolio planning appears to be limited.

We also recommend that the CEWO discuss the potential to use state environmental water holders for water trading, as their trading processes are more advanced and efficient than the CEWO's. For example, there may be opportunities to 'piggyback' on trading actions by other environmental water holders to improve the overall efficiency of water trading actions.

Further, based on our analysis and interactions with state environmental water holders, they are more active in the water market. Therefore, strengthening working relationships could help the CEWO better understand how it can be more transparent in liaising with other water holders without risking influencing the market.

### Recommendation 4: Use funding for environmental activities that reduce the impact of the Goulburn to Murray IVT rule and operating rules

The CEWO could use its increased flexibility to sell environmental water when the proceeds can be used to fund environmental activities to reduce flow constraints in the Goulburn River that are not part of a SDL adjustment mechanism to alleviate constraints.

The CEWO could consider undertaking a stocktake of potential environmental projects aligned with the environmental activities criteria to understand whether any projects in the Goulburn could offset the impacts associated with flow constraints. This will help to ensure that projects are available to be funded when opportunities arise to trade water.

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<sup>4</sup> Note that Marsden Jacob is an affiliate member of the AWBA, which provides no voting or authority but indicates support for the cause. The VEWH and the NSW Department of Planning and Environment use only AWBA intermediaries as part of their trading.

**Recommendation 5: The CEWO should be more active in considering portfolio options other than use to help mitigate the impact of flow constraints.**

The CEWO could undertake more frequent portfolio planning and assess options other than to use (and to a lesser extent carry over) water to ensure that the portfolio is kept within manageable bounds. The interim Goulburn to Murray IVT rule and trade constraint primarily reduce the ability of the CEWH to deliver environmental water both in the Goulburn system and beyond into the River Murray system. Coupled with constraints on Lake Eildon releases and low-lying irrigator pumps, constraints are expected to be more frequent than previously experienced.

The recommended process for considering portfolio options could be integrated into established portfolio planning documentation or benefit from a standalone and combined policy (see sections 3 and 4 of this report).

When implemented, the portfolio planning framework will draw together existing information that the CEWO is already collecting as part of its routine planning processes; however, all portfolio options would now be considered together rather than individually.

A fully implemented framework could:

- reduce the impact of the Goulburn to Murray IVT rule and trade constraint
- reduce the likelihood of having too much water in the CEWO's Goulburn account at the end of the water year
- increase the likelihood that all portfolio options will be considered together and frequently, allowing for direct comparisons of their expected environmental outcomes
- ensure that all key considerations are evaluated so that robust and defensible decisions associated with portfolio options are made.

**Recommendation 6: The CEWO should engage with the Murray–Darling Basin Authority and the Office of Water Compliance to assess whether the apparent prioritisation of held consumptive water over held environmental water is compliant with the *Water Act 2007*, the Basin Plan 2012 and intergovernmental agreements.**

The CEWO could work collaboratively with the Murray–Darling Basin Authority to consider whether the prioritisation of regulated water held by consumptive users over held environmental water under the interim Goulburn to Murray IVT and operating rule constraints is compliant with federal legislation and agreements. In particular, Section 5 ('Managing water for the environment') of the Intergovernmental Agreement on Implementing Water Reform in the Murray Darling Basin states:

*Except as otherwise agreed between the Commonwealth and the relevant State(s) to facilitate improved environmental watering, **Basin States agree that the characteristics of licensed entitlements held for environmental use will not be enhanced or diminished relative to like entitlements held and used for other purposes.** This includes that they will be subject to no less favourable conditions, including with respect to fees and charges, access to allocations, capacity to use, trade, and carryover, than like entitlements held for other purposes. The Parties note that any agreement to change the characteristics of licensed entitlements held for environmental use should not impact on another state's water availability, rights or entitlements under the Murray–Darling Basin Agreement unless agreed to by the affected state.*

This could help to show that the environmental water held in the Goulburn system is there to service environmental needs in the Goulburn and the broader River Murray, as envisaged when the sustainable diversion limits in the Basin Plan were struck. If the water is able to be used less flexibly, then increased water recovery targets may be needed.

Should there be any discrepancies between the relevant legislation (or agreements) and the current interim Goulburn to Murray IVT and operating rule, the CEWO and VEWH may be able to seek rectification from Victoria to ensure that held environmental water is treated equally and reflect that environmental water held in the Goulburn has a broader purpose for the community over long lengths of river.