

SUBMISSION BY THE COMMONWEALTH ENVIRONMENTAL WATER HOLDER ON THE DRAFT LACHLAN REGIONAL WATER STRATEGY

About the Commonwealth Environmental Water Holder

The Commonwealth Environmental Water Holder (CEWH) is a statutory position established under the *Water Act 2007* (Cth). The CEWH is responsible for managing the Commonwealth holdings of environmental water. These water holdings are managed to protect and restore the environmental assets of Murray-Darling Basin (the Basin), including rivers, lakes, wetlands and floodplains, in the national interest. The CEWH manages the Commonwealth water holdings in accordance with the Basin Plan.

The Water Act also gives effect to relevant international agreements, including the Ramsar Convention for wetlands of international significance, and conventions that protect endangered and migratory species. The CEWH's function is a part of the sustainable management of the Basin's water resources over the long-term for environmental, social and economic outcomes.

1. General comments

The CEWH appreciates the opportunity to provide feedback on the draft regional water strategies as part of the engagement being undertaken by NSW. The CEWH recognises the significance of these strategies in planning for, and balancing, the demands on river systems across NSW for future decades. The CEWH recognises how severe the recent drought has been for communities across the Basin, particularly in the north, and the challenges in achieving a balance under these circumstances.

The CEWH acknowledges that the regional water strategies are in the context of the NSW *Water Management Act 2000*, which places a strong emphasis on protecting critical human and critical environmental needs, including during dry times. The CEWH also acknowledges the potential connections between the regional water strategies and the Basin Plan, particularly in regard to the protection of planned environmental water. For transparency and clarity, the community may benefit from a clear explanation of the relationship between the regional water strategies and the Basin Plan.

1.1. Existing Commitments

The Draft RWS references existing commitments to projects including the Wyangala Dam raising business case; the Rowlands to Carcoar pipeline; and the Lake Rowlands augmentation feasibility investigation, which are being led by WaterNSW. The RWS contains a number of other potentially viable options that may have the capacity to address at least some of the needs to which the existing commitments have been aimed. The CEWO welcomes the RWS as an opportunity to consider a wider range of proposals, and to potentially provide an avenue for suggestions on further options that have not as yet been identified.

The CEWO also notes that the current NSW Legislative Council inquiry into some of these existing commitments has heard some evidence and received additional submissions regarding potential for alternative infrastructure investment that is highly relevant to the Lachlan RWS¹. There would be

¹ The submission and evidence received from ANU Professor Jamie Pittock, who is also a member of the Wentworth Group of Concerned Scientists, is an example (that also aligns with similar arguments that Professor Pittock provided to the Wyangala Dam Raising EPBC referral public consultation process).

benefit in transparently and publicly assessing the economic and environmental benefits of these alternative irrigation efficiency infrastructure investments.

This could include investigation of the potential for the Government’s share of the water savings dividends from these alternatives to be directed to innovative water policy approaches aligned with underwriting town water supply security (specifically drought conveyance for town water supplies) under extreme drought.

1.2. Future climate prediction

The Draft Lachlan Regional Water Strategy (the RWS) provides new information on likely climate and water availability implications in the region. This is a significant contribution and can assist all stakeholders to manage water in a highly variable and changing climate.

We note that the discussion of climate risk undertaken for the Macquarie catchment appears to have included additional important information not provided for the Lachlan.

Further investigation of the risks to cease-to-flow periods (which can be associated with severe environmental impacts), like the analysis undertaken for the Macquarie (Figure 20, Macquarie draft RWS) would be a valuable addition to the Lachlan RWS.

In addition, an analysis of the impacts on the frequency of small and medium flood events (which is especially important given the impact on this flow range associated with the proposed enlargement of Wyangala Dam) would also be a valuable addition to the RWS.

The climate analysis raises several key issues that need further consideration.

a) Rising temperatures and higher evapotranspiration – impact on streamflow

We note that the focus of the climate modelling undertaken for the RWS appears to be on rainfall for the most part, with a particular emphasis on the likelihood of long rainfall deficits. The analysis presented at section 2.1 does not appear to reflect the fact that streamflow responses can be highly sensitive to small rainfall decline and that these effects are exacerbated by increases in evapotranspiration and evaporation associated with temperature rises. **More information on likely streamflow responses to climate modelling, reflecting the combination of predicted long term rainfall trends in conjunction with increased temperature impacts on evaporation and evapotranspiration would be a valuable addition to the RWS.**

b) Rising temperatures and the implications for river transmission losses

Rising temperatures, and the associated increase in evaporation and in riparian vegetation evapotranspiration, have the potential to impact on the volume that is required to be set aside in the water budget to “run the river” before additional water allocations can be made. This has the potential to impact on water allocation determination at all times, not just during extreme drought. However, in circumstances of extreme drought, this has the potential to lead to either (i) earlier and deeper suspension of water allocation accounts; or (ii) even greater limitations on water available to “run the river” during drought, with increased likelihood of damage to instream ecology – such as a higher risk of the fish kills observed in other systems associated with exaggerated cease to flow periods.

Additional advice on the implications of rising temperatures and the associated evaporation and evapotranspiration increases on transmission losses, including but not limited to drought years, would be a valuable addition to the RWS.

c) *Rising temperatures and the implications for water demand for a range of purposes*

Rising temperature trends are likely to lead to altered demand profiles, and to reduce the effectiveness of current water allocations in meeting water demands for town supplies, irrigation cropping, and the riverine environment. **Clarification of whether the impact of rising temperature on both town water supply demand and irrigation crop water demand will have a significant influence on system responses (particularly increased utilisation of town water supply entitlements, the implications for drought management, and the consequent impact on General Security water allocation reliability) would also aid analysis of options under the RWS.**

d) *Drought of record allocation basis*

The Lachlan system, like other NSW MDB valleys, uses a pre-2004 historical record drought sequence as the basis of water allocations. The Millennium Drought showed that even lower inflows can and have occurred more recently, leading to an increased likelihood of water allocation suspension. However, unlike most other NSW valleys, a *Continuous Accounting* approach is used in the Lachlan, with a rolling longer drought period of up to 3 years used to identify the minimum inflow sequences used as the basis of water allocations to water entitlements.

Continuous accounting trades off smaller more frequent allocation increases in favour of larger improvements at reduced frequency (sometimes erroneously interpreted as contributing to “unreliable” allocations). Continuous accounting also provides more favourable carryover arrangements, but the approach also introduces a higher likelihood of allocation *restrictions*, with consequences for planning and the allocation water trade market.

A side effect of the continuous accounting approach is that shorter periods of intense drought can and do occur – with apparent increasing regularity in recent decades. This leads firstly to large “shortfalls” of inflow volume (routinely of the order of 100+GL, and up to about 400GL in 2019) that must be received in a month prior to additional allocations being made available. These large shortfalls can be buffered by the existing very large public storage capacity in the Lachlan Valley (already one of the largest public storage:SDL volume ratios in the MDB) for short periods of drought, but as drought periods lengthen water allocation account balances must be suspended in favour of prioritising critical human needs under NSW Incident Response Guide arrangements.

Further analysis of changes in the frequency of allocation restriction due to increasing occurrence of low inflow periods associated with climate scenario predictions, both with and without Wyangala storage augmentation, would be a valuable addition to the RWS.

e) *More Severe Paleo-Climate Drought Sequences*

While at face value it may appear encouraging to understand that recent droughts appear not to be unprecedented within the paleo-climate record, this introduces a new concern for the suitability of current water planning arrangements. **An investigation of how the current water planning arrangements would fare under the worst case scenario newly identified in the paleo-climate record, including whether critical water needs and the needs of the environment (as defined by the NSW Incident Response Guide) would be a very valuable addition to the RWS.**

f) *Clarification of Town Water Supply Security Implications*

The Snapshot summary at Chapter 2 contradicts statements at 2.3.2 People and Towns relating to the threat to town water supplies. The Snapshot states “*Wyangala Dam is unlikely to fall below dead*

storage based on long-term paleoclimate records and short term climate projections". It also says *"the towns of Cowra and Forbes, which are supplied from water stored in Wyangala Dam, are at a low risk of experiencing water supply shortfalls based on their current water access licence volumes"*. Further, at section 2.3.2 on pp 73 the RWS describes groundwater augmentation of Cowra and Forbes town supplies. Yet at Table 2 on pp 74, the RWS describes Cowra and Forbes as having **Very High** Water Security Risk. These statements should be clarified, especially in light of the mooted benefits and dependencies of these towns on Wyangala enlargement.

1.3. Existing Water Management Arrangements

The discussion at section 2.2.3 invites a discourse around the current water management arrangements in the Lachlan Valley. The CEWO notes that there has been considerable discussion about this issue via the Stakeholder Advisory Panel (SAP) process convened by DPIE Water to consult on the development of the Lachlan Water Resource Plan. However, this invitation is warranted given the major changes to water resource management that will result from major water infrastructure developments and new data on climate risks.

Section 2.2.3 contains a useful description of water entitlement types and includes a commentary on the reliability versus yield trade-off in the Lachlan that has resulted in higher reliability of General Security allocations in lieu of full utilisation of the SDL.

However, the discussion could also provide context that the Lachlan system is unusual in NSW in not featuring Supplementary Access Licences (SAL). While SAL is correctly identified in Table 1 on pp 64 as having the lowest priority under both extreme events and in normal circumstances, SAL nonetheless plays an important role in other NSW valleys in providing access to water that cannot be conserved within the State owned and operated water storage infrastructure suite. A discussion of the balance of Lachlan entitlements would be a valuable addition to the RWS, including whether the absence of SAL leads to an over-reliance on public infrastructure given that the Lachlan valley, in the absence of SAL, has the smallest ratio of private storage:public storage of any major valley in the NSW MDB. Whilst the absence of private storage perpetuates as a relative lack of private floodplain harvesting infrastructure concern in the Lachlan, this should be viewed in the context of the floodplain harvesting risks associated with major infrastructure augmentation such as raising Wyangala Dam.

Importantly, the introduction of a form of SAL could incentivise private investment in additional water storage. A discussion of this approach could provide useful economic context regarding the extent to which industry is prepared to value additional storage. This context would provide extremely useful insight into the relative value of major dam augmentation.

1.4. Water for the Future

Chapter 2 could be further improved with a reflection on how environmental water recovery was implemented in the Lachlan Valley. This is particularly relevant to sections 2.2.3 and 2.3.3.

Section 2.3.3 includes the Moxey Farms irrigation efficiency case study. This positive case study was one of the very few opportunities to invest in irrigation efficiency in the Lachlan Valley under the Water for the Future program. Water recovery (for the environment, with recovered water entitlements now managed by the CEWH) in the Lachlan was achieved overwhelmingly via market purchase, and the purchase was completed in 2010 before irrigation efficiency programs (OFIEP - the On-Farm Irrigation Efficiency Program; and PIOP – the Private Irrigation Infrastructure Operators Program) had a chance to be implemented in the valley. Accordingly, the Lachlan irrigation industry has had little support to

upgrade irrigation systems, which have been left behind and are now amongst the least efficient in the Basin.

Rather than presenting solely as a problem, the lack of past investment provides an opportunity to invest in modernising irrigation infrastructure for multiple benefit. Whilst the SDL “Gap” was bridged in 2010 (a recent adjustment of agreed “Cap” factors now shows a small “gap” remains) an alternative program design could be developed to provide water savings that could be used to share water savings between participating irrigators and town water supply security – a win:win. Irrigation efficiency investment has the potential to boost farm productivity beyond providing a small source of additional water. These options are likely to be climate resilient (conveyance allocations generated from savings are more reliable than General Security and accrue from system operation, and are hence partially disconnected from inflow timing) and provide environmental benefit (from additional drought conveyance in times of extreme drought when Held Environmental Water is not available – a benefit to all water users, not just potentially to town water supply) as well as avoiding the environmental impact associated with major dam augmentation. Assessing this option in terms of cost-effectiveness and improvement in water availability would be a valuable addition to the RWS.

1.5. Consistency with the Basin Plan

The implementation of options in the Regional Water Strategy must be consistent with the Basin Plan. The options cannot result in a net reduction in planned environmental water, nor result in substitution of held environmental water. Critical environmental demands that are reliant on water sharing plan rules, and river operations need to continue to be met.

The environmental outcomes sought by the Basin Plan and the water recovery targets were based on existing planned environmental water volumes. Any options that reduce planned environmental water could create an additional demand on water held by environmental water managers, with the consequence that additional water recovery would be required to meet the environmental outcomes expected from the Basin Plan.

New infrastructure within the Basin will be required to operate consistently with the Basin Plan provisions including the Sustainable Diversion Limits (SDL)². Improvements in reliability of supply may need to be offset to be compliant with the SDLs. Certain infrastructure options may require changes to Water Resource Plans which may require accreditation.

1.6. Impact on the environment

Options that lead to changes or reductions in river flows may compromise the achievement of Environmental Water Requirements (EWRs) in the Long-Term Water Plan (LTWP), and outcomes in the Basin-wide Environmental Watering Strategy. These changes may impact the Lachlan River, the Booligal Wetlands, Great Cumbung Swamp, and other environmental assets and species in the valley.

Options that result in reduced flooding may impact on groundwater levels, recharge rates and ongoing sustainability of groundwater access. These impacts may be further exacerbated under climate change with predictions of less rainfall, runoff, and an increase in drier times. Increased use of groundwater may result in drawdown areas, impact on groundwater dependent ecosystems, river flows and

² MDBA submission on infrastructure.

<https://www.parliament.nsw.gov.au/lcdocs/submissions/69285/0125%20Murray%20Darling%20Basin%20Authority.pdf>

wetlands. This may increase environmental demands in river and wetland systems and the volume of water required to meet those demands.

Potential impacts of the proposed options on matters of National Environmental Significance such as threatened and migratory species would need to be assessed in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* in addition to any requirements under relevant NSW environmental legislation such as the *Biodiversity Conservation Act 2016*.

The draft regional strategy includes many options to support critical human needs and improved water security but has limited options to address critical environmental needs during extended dry times. Additionally, many options are likely to lead to reductions in water in rivers, creeks and possibly groundwater systems during dry times and exacerbate critical environmental needs. The significance of these impacts needs to be determined before such options should be considered for implementation. The Strategy should include measures to mitigate some of the risks to and protect the health and resilience of the environment.

2. Comments on Long List Options

Table 1 below summarises the CEWO's comments on the Long List of options contained in section 3.4.

Table 1 – CEWO comment on Long List Options for the draft Lachlan Regional Water Strategy

Option	Risks to CEWH / Water Act / Basin Plan obligations	Benefits to CEWH / environment	Comments
1. Water transfer pipeline between Lake Rowlands and Carcoar	Low		EIS required to confirm low risk, in particular to the local environment downstream of Lake Rowlands, which could be expected to experience a reduction in stream flows.
2. Wyangala Dam raising project	High	Nil	This project has the potential to cause major changes to the hydrology of the Lachlan River downstream, that could significantly impact Matters of National Environmental Significance under the EPBC Act. The proposal has the potential to cause significant alteration of the timing of Planned Environmental Water, eroding baseline environmental condition that formed the basis of the Lachlan River Water Resource Unit’s Sustainable Diversion Limit under the Murray-Darling Basin Plan. This project has been determined to be a Controlled Action under EPBC Act, and has not yet been assessed.
3. Lake Rowlands augmentation	High*	Nil	This project is at an earlier stage than 2 above, and is subject to environmental assessment. *While impacts in the Belubula tributary valley are potentially significant, the impact is likely to be much smaller in scale than 2 above.
4. Expansion to the piped town water supply system	Low	Nil	No comment
5. Replacement and upgrade of existing pipelines	Low	Nil	No comment
6. Inter-regional	Low	Nil	No comment

Option	Risks to CEWH / Water Act / Basin Plan obligations	Benefits to CEWH / environment	Comments
connections project investigation			
7. Water quality treatment works	Low	Nil	No comment
8. Managed aquifer recharge investigation and policy	Low	Nil	Support in principle subject to water being obtained from existing entitlements within SDL
9. Reuse, recycle and stormwater projects	Low	Nil	Support in principle
10. Reliable access to groundwater by towns	Low	Nil	No comment
11. Cold water pollution mitigation measures	Low	High	Strongly support. Addressing CWP would reduce impact on native fish and would enhance habitat available to support recovery
12. Environmental restoration works	Low*	High*	Support in principle. *Subject to environmental assessment and approval for creek clearing option.
13. Improved management of	Low	High	Supported

Option	Risks to CEWH / Water Act / Basin Plan obligations	Benefits to CEWH / environment	Comments
wetlands on private land			
14. NSW Fish Passage Strategy	Low	Very High	Strongly supported. Note that previous commitments under NSW Fisheries Management Act remain unimplemented in the Lachlan. New works that require additional fish passage offsets should not rely on works already required to meet previous commitments.
15. Active management of flows	Low	High	Potential applies to upper Lachlan, Belubula and unregulated tributaries noting that the regulated Lachlan system does not feature Supplementary Access Licences.
16. Water quality restoration works	Low	High	Supported.
17. Floodplain management works	Possible	Uncertain	More information needed
18. Diversion screens to prevent fish extraction at pump offtakes	Low	Very High	Strongly supported. This has significant potential to boost native fish numbers by reducing large irrigation bycatch
19. River Ranger program	Low	High	Strongly supported. Requires coordination with other programs eg MDBA, ILSC.
20. Secure flows for water-dependent	Low	High	Add a minimum flow target downstream of Wyangala Dam (knowledge is emerging re: cultural importance of baseflows in this reach).

Option	Risks to CEWH / Water Act / Basin Plan obligations	Benefits to CEWH / environment	Comments
cultural sites			
21. Improved understanding of groundwater processes	Low	Medium	Supported in principle. This option can inform groundwater recharge risks associated with reduced flood events caused by the raising of Wyangala Dam.
22. Sustainable access to groundwater	Low	Not certain	This process appears to duplicate the MDBA's Basin Plan review process – additional benefits are uncertain.
23. Improved clarity in managing groundwater resources sustainably	Low	Not certain	This process appears to duplicate processes needed to review groundwater SDLs in the Basin Plan.
24. Water efficiency projects (towns and industries)	Low	High	Supported. Could revive the Strengthening Basin Communities program with modified water savings dividends (directed to drought conveyance reserves for example).
25. Lower Lachlan efficiency measures	High	Nil	Not supported. Risks Planned Environmental Water outcomes, creating an additional demand on HEW that may need to be offset via further water recovery.
26. Mid-Lachlan efficiency measures	High	Nil	Not supported. Risks Planned Environmental Water outcomes, creating an additional demand on HEW that may need to be offset via further water recovery.

Option	Risks to CEWH / Water Act / Basin Plan obligations	Benefits to CEWH / environment	Comments
27. Improvements to the storage effectiveness of Lake Cargelligo	High	Uncertain	More information needed. May reduce Planned Environmental Water outcomes, creating an additional demand on HEW that may need to be offset via further water recovery.
28. Review of water trade in the Lachlan region	Low	Nil	Support in principle, subject to the CEWH's water holdings maintaining their character consistent with the same rules applied to other holders of like entitlements.
29. Water pricing pilot study	Low	Nil	This process appears to duplicate WaterNSW pricing review processes that are very well managed. It is reasonable to expect that WaterNSW would reflect on issues emerging from the RWS (this comment applies generally, not just to pricing).
30. Urban water restriction policy	Low	Nil	Supported. Greater transparency in water resource management is to be encouraged at all levels.
31. The 'Sheet of Water' storage	Possible	Uncertain	More information required. Note comments on protection of PEW in comments at 1.5 and 1.6 above
32. Efficiency for drought security program	Low	Major benefit	Very strong support. This option appears to be the best option available of any described in the RWS for the purpose of enhancing water supplies in the valley. This approach represents a 21 st Century response to 21 st Century water management challenges.
33. Drought operation rules	High	Possible	Note that option 32 has the potential to be used to boost drought conveyance reserves for benefit to industry, towns and the environment and should be incorporated into any review of drought operating rules.

Option	Risks to CEWH / Water Act / Basin Plan obligations	Benefits to CEWH / environment	Comments
34. Review of water accounting and allocation processes	Possible	Possible	<p>This option should be considered in the context of providing greater assurance to the water market.</p> <p>Both option 33 and 34 must recognise that like entitlements should be treated equally, a foundation principle upon which the water market has been established. The hierarchy of “high priority” needs should be defined clearly and consistently with the Water Act 2007, Basin Plan, and accredited WRPs.</p>
35. Investigation of licence conversions	Possible	Uncertain	<p>More information is needed on conversion rates.</p> <p>This option must avoid impacts on the reliability of entitlements held by third parties. It must also ensure protection of PEW consistent with the Basin Plan.</p> <p>While this approach has generally been applied to <i>General Security to High Security</i> and <i>High Security to Unregulated (above dam)</i> entitlements, the conversion of existing <i>Lower Lachlan Unregulated to Supplementary Access Licences</i> should also be investigated.</p>
36. Improved data collection and storage	Low	Medium	Support in principle, including providing additional information around the operation of Translucent Flow rules in real time.
<p>37. Training and information sharing programs:</p> <ul style="list-style-type: none"> – new climate data/ modelling – managing groundwater resources sustainably 	Low	Possible minor	Support in principle

Option	Risks to CEWH / Water Act / Basin Plan obligations	Benefits to CEWH / environment	Comments
38. Investigation to maintain amenity for regional towns during drought	Low	Possible minor	Support in principle
39. In-stream storage for the Lower Lachlan	High	Nil	Not supported. This option represents a very high risk of the erosion of PEW outcomes in the Lower Lachlan. In addition, on-river storage reduces fast flowing habitat favoured by native fish for slow flowing habitat unsuited to native fish. Providing fish passage past a new structure would not address this shortcoming.
40. Land use change impact on water resources	Low	Possible	More information needed. There are threats and opportunities for balanced water resource management outcomes in managing land use change impacts. Opportunities include positive Integrated Catchment Management outcomes to water quality and stream baseflows associated with Regenerative Agriculture practices. Broad scale implementation of such methods is being trialled by the Mulloon Institute for example, which has the potential to defer major storage augmentation projects in the Shoalhaven catchment.
41. Culturally appropriate water knowledge program	Low	Possible	Supported. Refer also to options 42 and 43.
42. Water-dependent cultural practice and site identification project	Low	Likely	Options 41-43 have the potential to lead to integrated cultural flow and environmental flow outcomes, and are supported accordingly.

Option	Risks to CEWH / Water Act / Basin Plan obligations	Benefits to CEWH / environment	Comments
43. Shared benefit project (environmental and cultural outcomes)	Low	Likely	Strongly supported. Refer also to options 41 and 42.
44. Aboriginal cultural access licence review	Low	Likely	Supported.
45. Water portfolio project for Aboriginal communities	Low	Possible	Supported. Should be coordinated with other programs.
46. Co-management investigation of Travelling Stock Reserves	Low	Possible	Supported.
47. Regional Aboriginal Water Advisory Committee	Low	Possible	Supported, subject to Aboriginal community views. This forum should be used to integrate advice/information into existing water management forums including EWAGs, CAGs, ROSSCos and SAPs.
48. Regional Cultural Water Officer employment program	Low	Likely	Supported in principle. This program should be integrated with other similar programs being implemented by MDBA and ILSC.

3. Concluding Remarks

The CEWO greatly appreciates the opportunity to provide comment on the draft Lachlan Regional Water Strategy. We look forward to further consultation on this very important work, including a response to the questions, issues and concerns that we have raised in this submission.