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Submission to the review of the *Water Act* 2007 (Cth)

August 2026

This submission responds to the key issues and questions identified in the *Water Act* Review Discussion Paper.[1] The Review questions are used as a guide rather than the structure of the submission, allowing related issues to be considered together and additional reforms to be identified.

1. Overall purpose and effectiveness of the *Water Act*

This section considers the overall purpose and operation of the *Water Act* and responds principally to Q1: To what extent have the objects of the *Water Act* been achieved?

The *Water Act* is a nationally significant piece of legislation that more fully implements Australia's obligations under international environmental treaties and has established important new institutions, including the Commonwealth Environmental Water Holder (CEWH) and the national water accounting and reporting provisions administered by the Bureau of Meteorology.

However, in many respects the implementation of the *Act* has fallen far below expectations and amendments are needed to enable better outcomes over the coming decade. A fundamental issue that impedes the achievement of the objects of the *Water Act* remains the ambiguity over its interpretation due to poor legal drafting of S3(c). There is continued obfuscation over whether it is an environmental act, with environment coming first, or whether it requires equal consideration of environmental, social and economic outcomes and that Basin water resources must be managed to 'optimise' these outcomes: the so-called 'triple bottom line approach'. The *Water Act* Review Discussion Paper says: 'The *Water Act* recognises the importance of managing Murray–Darling Basin (MDB) water resources in a way that optimises economic, social and environmental outcomes' but then goes on to state the primary objects of the *Act* are environmental ones and that it includes 'a range of mechanisms to consider and influence social and economic impacts on communities, industries and First Nations peoples.'[2] This statement would appear to conflate the environmental interpretation and the triple bottom line approach, highlighting the confusion over this issue.

[1] Wentworth Group Member Dr Teagan Shields had no involvement in this submission given her role as First Nations Advisor for the Water Act review.

2 DCCEEW (2026) Independent review of the *Water Act* 2007. Discussion paper. Department of Climate Change, Energy, the Environment and Water, Canberra, p 6. https://www.dcceew.gov.au/sites/default/files/documents/water-act-review-discussion-paper-july-2026.pdf

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The triple bottom line approach was comprehensively refuted by Commissioner Bret Walker in the report of the Murray–Darling Basin Royal Commission (Walker 2019, p. 20).[3] If all three elements are operating equally and simultaneously in determining the limit of take, as the word 'optimise' would suggest, then how does a decision-maker adjust the recovery target for the setting of a Sustainable Diversion Limit (SDL) up or down with reference to each element? The elements are effectively incommensurate and thus cannot be optimised. Trade-offs will always have to be made between them, so there is no workable basis for the triple bottom line approach.

In its response to the Royal Commission report, the MDBA (2019, pp. 7, 9)[4] did not address Walker's critique of how the triple bottom line approach could be implemented for the setting of SDLs. If the Basin Plan is to be implemented lawfully, with best available science used in decision making, then it requires the MDBA to detail the method by which environmental, social and economic outcomes are optimised in the setting of the SDL and ESLT. The MDBA has not done so.

This issue of the disputed objects of the *Water Act* is central to how the Basin Plan is implemented because the determination of what is accepted as best available science, a requirement for the basis of decision making under the *Act*, is linked inextricably to which interpretation of the *Act* is used in practice.

There is an urgent need to clarify that the object of the *Act* is primarily environmental and that environmental considerations have priority over social and economic ones. Without this clarity, in law and in practice, the objects of the *Act* (S3(b); to give effect to international environmental agreements and provide for special measures to address the threats to Basin water resources) cannot be met. This is not a hypothetical risk. In practice, the principles and targets of the major enabling treaties (the Convention on Biological Diversity (CBD) and the Ramsar Convention on Wetlands) have not been translated into measurable environmental outcomes in the Basin Plan. Neither the *Act* nor the Basin Plan requires restoration or protection of a representative area of the major wetland ecosystem types, despite this being a requirement under the Global Biodiversity Framework (GBF) of the CBD. The objects of the Act give effect to these agreements but without mechanisms to ensure they are implemented effectively.

Recommendation

Amend S3(c) of the *Water Act* to remove the 'optimise' framing and replace it with an explicit hierarchy of uses, consistent with National Water Agreement Principle 6.1.5, under which environmental sustainability and critical human water needs take precedence and social and economic outcomes are pursued subject to, rather than co-equal with, that priority.[5]

3 Walker, B. (2019) Murray–Darling Basin Royal Commission Report. Government of South Australia, Adelaide, p. 20. https://cdn.environment.sa.gov.au/environment/docs/murray-darling-basin-royal-commission-report.pdf
4 MDBA (2019) MDBA response to the South Australian Royal Commission. Murray–Darling Basin Authority, Canberra. https://www.mdba.gov.au/sites/default/files/publications/mdba-response-sa-royal-commission-feb-20.pdf
5 DCCEEW (2026) National Water Agreement. Department of Climate Change, Energy, Environment and Water, Canberra, p. 20. https://www.dcceew.gov.au/sites/default/files/documents/national-water-agreement-2026.pdf

2. First Nations water rights, outcomes and UNDRIP

This section considers First Nations rights, interests and outcomes under the *Water Act* and responds to Q2 and Q3 and the First Nations dimensions of Q7: Q2. What are the opportunities for the *Water Act* to improve the delivery of First Nations economic, environmental, social, spiritual and Cultural outcomes? Q3. What are the opportunities for the *Water Act* to promote the principles set out in UNDRIP? Part of Q7. What are the opportunities for the *Water Act* to support social and economic outcomes, including for First Nations?

First Nations peoples have ancient and abiding cultural, spiritual, social, environmental and economic connections to water and land. Yet, few First Nations communities have ownership, management or stewardship of culturally significant wetlands. In the Murray-Darling Basin, First Nations peoples control less than 0.2 percent of surface water entitlements and 0.02 percent of groundwater despite representing over five percent of the population and with Native Title granted or claimed on a third of the area.[6]

First Nations peoples have distinct rights, connections and cultural obligations relating to water that have been recognised in international agreements to which Australia is a signatory, including the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the Convention on Biological Diversity (CBD). Yet the *Water Act* does not adequately account for First Nations people's values, water rights and aspirations. While governments have committed modest funding to buy water entitlements for First Nations, including the $100 million Aboriginal Water Entitlements Program, progress has been very slow. Rising water prices are likely to be eroding the real value of that commitment.

Amendments to the *Act* in the *Water Amendment (Restoring Our Rivers) Act* 2023 (Cth), including the requirement (S253(1A)) that this review identify opportunities to promote UNDRIP principles and the annual First Nations environmental watering reporting duty at S85E, represent genuine progress. However, as currently drafted these provisions only require *consideration* of First Nations interests, not binding *outcomes*. 'Having regard to' and 'taking into account' are legally weak and there is no legal requirement to act.

Meaningful water justice requires securing water rights for First Nations for cultural, environmental, economic or other purposes as determined by First Nations peoples. It also requires investment in First Nations-led governance, river ranger programs and building long-term capacity to care for Country. Assistance of First Nations peoples in owning and managing wetlands is essential.

For First Nations peoples, water is inseparable from Country and the responsibilities, knowledge and practices that sustain it. Treating water solely as an allocative or tradeable resource has fragmented these relationships and limited cultural and environmental outcomes. Reconnecting

6 Hartwig, L., Markham, F. and Jackson, S. (2021) Benchmarking Indigenous water holdings in the Murray–Darling Basin: a crucial step towards developing water rights targets for Australia. *Australasian Journal of Water Resources* 25, 98–110. https://doi.org/10.1080/13241583.2021.1970094

water and Country requires recognising First Nations as custodians with decision-making authority and supporting integrated, First Nations-led water management.

Recommendations

1. Strengthen S3(fa) and S21 by changing 'have regard to' duties into binding requirements that the Basin Plan and Water Resource Plans (WRPs) demonstrably advance First Nations water rights and interests, not merely consider them. This amendment would help close the gap between the stated objects of the *Act* and enforceable obligation.
2. Set and require statutory targets for water entitlements and cultural flows owned and managed by First Nations on a self-determined basis, with progress publicly reported through the existing S85F annual reporting mechanism, rather than creating a new, separate reporting duty.
3. Embed UNDRIP principles explicitly in the accreditation criteria for WRPs (S63, 22). Currently, S253(1A) requires this Review to identify UNDRIP opportunities, but nothing in the *Act* requires WRPs to demonstrate alignment with UNDRIP principles.
4. Fund culturally appropriate, long-term programs with First Nations knowledge holders and river rangers, embedded through the environmental watering planning provisions in the Basin Plan, rather than leave such initiatives to discretionary programs under as Aboriginal Water Entitlements Program alone. This amendment would reduce the risk that First Nations water justice remains dependent on year-to-year funding decisions outside of the framework of the *Act*.
5. Seek opportunities for First Nations to own and manage wetland areas, consistent with Australia's commitments under the CBD and GBF, including through Indigenous Protected Areas and Other Effective area-based Conservation Measures (OECMs). This could be achieved through a partnership with the Commonwealth Environmental Water Holder.

3. Governance, accountability and institutional arrangements

In this section we respond to Q4. Are the institutional and governance arrangements under the *Water Act* effective in ensuring accountable, efficient and transparent decision-making? If not, how can they be improved?

We strongly support the *Water Act* requirement that decisions for the realisation of its objects are to be based on 'best available scientific knowledge and socio-economic analysis.' However the *Act* does not define what this means. Without a statutory definition, the requirement is unenforceable in practice and open to interpretation. Decisions can be defended as 'best available science' without meeting any consistent evidentiary standard. We consider agencies have taken the opportunity to interpret 'best available science' as research that supports their policy initiatives and to ignore or marginalise research findings that contradict them or represent 'inconvenient truths.'

We define best available science as having the attributes of *salience*, regarding its relevance and scope to decision making; *credibility*, in that it is authoritative, plausible and technically adequate and *legitimacy* in that it is publicly available, can be replicated, is independent of vested interests and is conducted according to the principles of scientific ethics.[7] A definition

7 Cash, D.W., Clark, W.C., Alcock, F., Dickson, N.M., Eckley, N. and Jäger, J. (2002) Salience, credibility, legitimacy and boundaries: linking research, assessment and decision making. John F. Kennedy School of Government,

such as this needs to be incorporated into the *Water Act* so there is no ambiguity about how information, research findings and knowledge can be interpreted and used.

Recommendations

1. Define 'best available scientific knowledge and socio-economic analysis' in the *Water Act*, incorporating requirements for peer review, transparency of methods and assumptions, and independent verifiability, and require subsidiary plans including the Basin Plan and WRP decisions to demonstrate compliance with that definition.
2. Broaden provisions to hold states accountable for implementing the intended and agreed outcomes of the *Act* and Basin Plan. For example in the Murray-Darling Basin, on constraints relaxation, and for the Commonwealth to amend non-compliant WRPs. The Commonwealth's existing 'step-in' powers (S68, 69, 72, 73) to prepare a WRP where a state fails to do so have never been exercised, despite four NSW WRPs remaining unaccredited for more than six years. This failure means compliance with SDLs cannot be formally assessed for these SDL resource units. The Basin Plan's effectiveness is dependent on all WRPs being in operation. The Productivity Commission (2023) found the 'step in' powers requires the Commonwealth to satisfy six procedures in the Act (S73), making it functionally unusable.[8] We recommend simplifying these preconditions and introducing an automatic referral trigger whereby a WRP that is overdue beyond a defined threshold or is otherwise non-compliant can be partially amended, rather than requiring full replacement, so the Commonwealth is not forced to choose between total inaction and a disproportionate intervention.
3. Close loopholes that have enabled consumptive take of water to grow through states increasing Baseline Diversion Limits (BDLs) and via the exploitation of the poor definition of Planned Environmental Water. On-farm water storage and floodplain harvesting are now subject to metering and licensing in most jurisdictions, but coverage, enforcement consistency and accounting integration with SDLs remain uneven across the Basin, leaving scope for unaccounted consumptive take to grow.
4. Simplify the overly complex planning systems to improve accountability of implementation measures. The current architecture, covering the *Water Act*, Basin Plan, MDB Agreement, WRPs and a wide array of Commonwealth and state institutions (cf. Appendices C and D of the *Water Act* Review Discussion Paper), has been described by the Productivity Commission as institutionally complex and difficult to navigate.[9] Complexity of this kind is obscures accountability by making it difficult for institutions with oversight responsibilities to be ensure outcomes are met.

Harvard University, Cambridge MA. https://dash.harvard.edu/entities/publication/73120378-eca2-6bd4-e053-0100007fdf3b Cash, D.W., Clark, W.C., Alcock, F., Dickson, N.M., Eckley, N., Guston, D.H., Jäger, J. and Mitchell, R.B. (2003) Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences* 100, 8086–8091. https://doi.org/10.1073/pnas.1231332100

8 Productivity Commission (2023) Murray–Darling Basin Plan: implementation review 2023. Inquiry report. Productivity Commission, Canberra, pp. 134–137. https://www.pc.gov.au/inquiries-and-research/basin-plan-2023/report/

9 Productivity Commission (2023), p. 225.

5. Require annual hydrological model calibration between modelled and observed river flows, to better monitor and refine management and bring state-controlled 'black box' hydrological models under national transparency requirements by extending the water information transparency structure of the Act (Part 7) to cover planning and compliance models and not just the data they produce. Models used to calculate SDLs and guide environmental watering decisions should be publicly accessible and independently validated against gauge data, with corrections published where systematic bias and errors are identified, particularly during low-flow periods.
6. Establish a positive duty of care on the Commonwealth to promote better environmental outcomes, including a statutory mechanism to give effect to Australia's commitments to the GBF 30 x 30 targets within Basin water management, rather than leaving this issue to non-binding policy arrangements.
7. Require independent scientific justification for the Sustainable Diversion Limit Adjustment Mechanism (SDLAM) projects. SDLAM projects, established under S23A of the *Act*, allow SDLs to be adjusted upward on the basis that supply measures deliver equivalent environmental outcomes. In practice, a number of these projects have proceeded without robust prior scientific justification and have proven negative or impractical in delivering the environmental equivalence intended.[10] We recommend the *Act* require independent, peer-reviewed assessment before SDLAM-style adjustments can be approved, with binding conditions if approved, and clear provision for reversal where post-implementation monitoring shows the promised equivalence has not materialised.
8. Improve cross-portfolio collaboration mechanisms. Many outcomes intended under the *Act* require co-ordination across Commonwealth Indigenous Affairs, Environment, and Water portfolios. These requirements are not being met effectively under current institutional arrangements and are fragmented.[11] We recommend a statutory coordination mechanism, for example, a requirement for joint reporting or a standing cross-portfolio committee, to ensure decisions in one portfolio account for their effects on others, rather than relying on informal or *ad hoc* approaches.
9. Introduction of National Water Planning Standards for best practice, which could be mandatory within the Basin and voluntary elsewhere, linked explicitly to standards under the *Environment Protection and Biodiversity Conservation Act* 1999 (Cth) to ensure consistency between the two principal Commonwealth statutes on environmental and water. This recommendation would extend the model currently in use, though in narrower form, of the power of the Director of Meteorology to issue National Water Information Standards (S130). This power is currently exercised only through non-binding collaborative guidelines rather than legislative instruments. A more binding mechanism for standards in planning practice, as well as data quality, would give the Commonwealth a mechanism to improve the quality of WRPs across jurisdictions without relying on state-by-state accreditation processes to achieve such standards alone.

10 Lyons, K., Pittock, J., Colloff, M.J., Yu, Y., Rocheta, E. and Steinfeld, C. (2023) Towards a scientific evaluation of environmental water offsetting in the Murray–Darling Basin, Australia. *Marine and Freshwater Research* 74, 264–280. https://doi.org/10.1071/MF22082

11 DCCEEW (2026) Independent review of the Water Act 2007. Discussion paper. Department of Climate Change, Energy, the Environment and Water, Canberra, pp. 25–29. https://www.dcceew.gov.au/sites/default/files/documents/water-act-review-discussion-paper-july-2026.pdf

10. Require independent third-party review of the Basin Plan, rather than self-review by the MDBA. Under s50 of the Water Act, the MDBA; the body responsible for preparing, implementing and administering the Basin Plan; is also the body required to review its effectiveness every 10 years. This is a structural conflict of interest: an implementing agency assessing its own performance cannot provide the level of independent scrutiny the scale and consequence of Basin Plan decisions demands. The Act already recognises the value of independence in oversight through the Inspector-General of Water Compliance, which monitors compliance separately from the agencies whose performance it assesses. We recommend the Basin Plan effectiveness review be conducted by an independent body, either an expanded IGWC mandate, or a dedicated independent review panel with statutory guarantees of independence, transparent methodology, and public reporting, rather than by the MDBA itself.

4. Water Resource Plans and adaptive water planning

This section responds principally to Q5: Is the role and administration of WRPs clear and fit for purpose?

The role and administration of WRPs could be much clearer and more fit for purpose.

Recommendations

1. Translate principles and targets of the major enabling international treaties, the CBD and the Ramsar Convention on Wetlands, into environmental outcomes, e.g. for conservation and restoration of representative areas of major wetland ecosystem types. We noted in response to Q1 above the failure of the *Act* to translate CBD and Ramsar obligations into measurable environmental outcomes, indicating S3(b) of the *Act* has not been met.
2. Ensure WRPs give effect to reporting conditions and cancellation of SDLAM projects where environmental equivalence is not achieved. Consistent with our recommendation re. S23A (Q4 above, for independent, peer-reviewed justification before approval and binding, reversible conditions on approvals), WRPs should be required to give effect to any conditions attached to a SDLAM project operating within the WRP area, including automatic review where monitoring shows environmental equivalence was not achieved.
3. Enable the Commonwealth to partially amend non-compliant state WRPs (cf. Section 3, Recommendation 2 above).
4. Include enforceable Environmental Water Requirements (EWRs) in Water Resource Plans, consistent with the recommendations on ESLTs in Section 6, below.
5. Establish regional governance arrangements in NSW equivalent to the Catchment Management Authorities in Victoria. The administration of WRPs in NSW will continue to be ineffective in NSW without regional governance arrangements. State government agencies lack capabilities, local knowledge and expertise to implement all aspects of WRPs, engage with local communities and consider options required for adaptation and change. This requires regional bodies that have a statutory mandate for integrated NRM, with boundaries that are geographically integrated with catchments, and expertise in water reform policy, hydrology and integrated catchment management.
6. More recommendations on WRPs are mentioned in section 2 and 3

5. Climate change and future water availability

Climate change is mentioned throughout the Review rather than having a specific question. The *Water Act* Review Discussion Paper states the capacity of the *Act* to respond to climate change is to be considered across the Review. Relevant questions are Q1, 4–6 and 8–11.

The objects of the *Act* do not mention climate change explicitly. This is a major omission, given the objects of the Act are the point of reference for decision makers and reviewers to judge whether the *Act* is doing its job. We recommend inserting an explicit object, and a corresponding requirement in S21, that the Basin Plan and WRPs must identify and respond to climate risks regarding water availability, using a dynamic, evidence-based methodology, rather than assuming historical climate conditions will continue. Without this amendment, each of the specific climate-related issues we have identified in Q1, 4–6 and 8–11 below lacks a legal basis for it to be fixed.

Q1. *Objects and operation*: the reliance in the *Act* contains an implicit assumption of the persistence of historical hydrological conditions and fails to require adaptive management in the use of Planned Environmental Water and Held Environmental Water entitlements as inflows decline under climate change.
Q4. *Governance and institutional arrangements*: there is no requirement to calibrate hydrological models against observed flows. There is a lack of transparency in state-controlled 'black box' models used to calculate compliance and inform environmental watering decisions. This situation compromises climate-related decision-making and adaptation.
Q5. *Water Resource Plans*: the WRP amendment process is too slow and resource-intensive to respond to new climate science and climate change impacts in a timely way, meaning even where evidence clearly supports an update, the legal instrument cannot easily be updated.
Q6. *Environmental water and ecological outcomes*: these issues include: 1) the static, historical-average basis for determining the Environmentally Sustainable Level of Take (ESLT); 2) the 'no net reduction' floor (rather than an actively maintained target) protecting planned environmental water; 3) the disproportionate climate-risk exposure of non-entitlement water; and 4) constraints on the Commonwealth Environmental Water Holder's ability to optimise environmental water use under climate-driven scarcity.
Q8. *Resilient communities*: neither the *Act* or the Basin Plan addresses the need for adaptation of Basin communities to a future climate with less water (cf. Section 7 below).
Q9. *Water quality*: risk of major poor water quality events (e.g. blue-green algal blooms, hypoxic blackwater) is likely to increase under climate change (cf. Section 8 below).
Q10. *Water information management*: projections of the effects of climate change used in modelling to support the Basin Plan are out of date and underestimate the impacts of global heating on irrigated agriculture and the environment in the Basin (cf. Section 9 below).
Q11. *Alignment of Water Act with National Water Agreement*: climate change should become a central design principle for water management under the National Water Agreement rather than be treated as an external risk (cf. Section 11 below).

6. Environmental water and ecological outcomes

This section responds principally to Q6: **What are the opportunities for the *Water Act* to optimise the use of environmental water to achieve additional environmental outcomes, especially in the face of a changing climate?** This section can also consider broader opportunities for the *Act* to improve ecological outcomes and the effectiveness of environmental water.

The *Water Act* Review Discussion Paper (p. 18 and p. 39) acknowledge the *Act* 'currently provides limited direction on how to consider climate change impacts.' Together with the ongoing overextraction of water resources in the Basin, we consider this a key barrier to the *Act* achieving its object of protecting ecological values and ecosystem services, under a hotter, drier, more variable Basin (3(d)(ii)). Our evidence for this statement is as follows:

1. Research from the Fenner School of Environment and Society, Australian National University, commissioned Wentworth Group found only 3% of Basin wetlands received flooding at the frequency they required between 1988–2024 and 40% received no flooding at all over the 36-year period.[12]
2. Sheldon et al. (2024) found most Environmental Water Requirements (EWRs) at most sites in the Basin are not being met, in part because they carry no legal enforceability, they are technical targets, not binding rules in Water Resource Plans.[13]
3. The MDBA 2025 Basin Outlook (cited in the *Water Act* Review Discussion Paper, S3.4.2) projects declining runoff, longer dry periods, more intense but less frequent overbank flows, and disproportionate impact on non-entitlement water (Planned Environmental Water, baseflows, conveyance water) which are weakly protected under the *Water Act* compared with Held Environmental Water entitlements.
4. WRP amendment is, according to the *Water Act* Review Discussion Paper (p. 33): 'complex and resource-intensive', and that 'In practice, this has meant that WRPs are often treated as fixed, point-in-time instruments and are not updated frequently. Even where science identifies a requirement for a response to new knowledge on effects of climate change, there is no clear mechanism to do so.

Under climate change, rainfall has become more variable, droughts are more frequent and severe and river flows are declining across much of the Basin, yet the *Act* was not drafted or implemented with the intent of being adaptable to a changing climate. The issues set out below are linked, systemic problems that need to be addressed holistically. Because the *Act* does not explicitly require climate responsiveness, the mechanisms meant to protect environmental water, baseflows, diversion limits, planning rules, enforcement powers, and underpinning models have stayed fixed at outdated settings.

Issues and recommendations

12 Chen, Y., Colloff, M.J. and Pittock (in review) How environmental watering for conservation of wetland vegetation in the Murray–Darling Basin can help meet Australia's commitments to the Kunming–Montreal Global Biodiversity Framework. *Environmental Management*

13 Sheldon, F., Rocheta, E., Steinfeld, C., Colloff, M.J., Moggridge, B., Carmody, E., Hillman, T., Kingsford, R.T. and Pittock, J. (2024) Are environmental water requirements being met in the Murray–Darling Basin, Australia? *Marine and Freshwater Research* 75, article no. MF23172. https://doi.org/10.1071/MF23172

Issue 1. The objects of the *Act* do not mention climate change explicitly, which means it is not written into that part of the *Act* that everything else is meant to serve and is used as the reference point to judge whether the *Act* is effective. **We recommend inserting an explicit object, and a matching requirement in section 21, that subsidiary plans including the Basin Plan and Water Resource Plans must identify and respond to climate risks to water availability, using a dynamic evidence-based methodology.**

Issue 2. The first issue concerns Planned Environmental Water (PEW), the water that must legally remain in the river system rather than be diverted for consumptive use. Under S21(5) of the *Act*, the Basin Plan must avoid a 'net reduction' in PEW protection compared with what existed under state laws before the Basin Plan began in 2012. This requirement is written as a baseline rather than a target; an intent not to make things worse, rather than a commitment to keep pace with what rivers actually need. Because climate change means lower flows, the legal protection can stay technically intact while the real volume of water it guarantees keeps shrinking. **We recommend that PEW protections are clearly defined and periodically reviewed to ensure PEW is capable of achieving the required outcomes despite climate induced losses.**

Issue 3. Even where the science clearly shows a Water Resource Plan (WRP) needs updating, the *Act* makes it extremely difficult to actually change one. Amending an accredited WRP currently requires running through almost the same lengthy drafting, assessment, and accreditation process as creating it from scratch. In practice, this means WRPs will not be easy to update even when new evidence demands it. **We recommend a separate, faster technical-amendment pathway specifically for evidence-based updates, kept distinct from full re-accreditation but still subject to public transparency requirements.** Ultimately, the Commonwealth should be able to require partial amendments of WRPs.

Issue 4. The Commonwealth Environmental Water Holder (CEWH), which manages roughly 3,120 gigalitres of environmental water entitlements on the Commonwealth's behalf, also operates under constraints that private water traders do not face. It has restricted access to market intermediaries and limited flexibility in how it can reinvest proceeds from trading, on top of the general government financial rules that bind it but not private participants. **We recommend bringing CEWH's market participation settings closer to private-participant norms while explicitly legislating its operational independence.**

Issue 5. The *Act* requires water information to be published, but the models underpinning SDL compliance and environmental watering decisions are not required to be made public, nor are they independently checked against real-world data on a regular basis. Known biases, especially during low-flow periods, carry through uncorrected into official compliance data. **We recommend extending the transparency requirements of the *Act* to cover these planning and compliance models, including public access to the models and mandatory annual validation against actual gauge data, with corrections published when biases are found.**

The Commonwealth Environmental Water Holder

There are additional constraints on the operations of the Commonwealth Environmental Water Holder that restricts its capacity to operate independently, efficiently and strategically in the delivery of environmental water and compromises its proprietary rights. These are as follows:

Lack of capacity to operate independently and on a strategic basis in Victoria

Under the *Water Act* 1989 (Vic) the Victorian government retains ownership and control of all water resources, so CEWH cannot hold or manage a water entitlement within Victoria's jurisdiction. CEWO water has to be transferred to the Victorian Environmental Water Holder and then ordered by the relevant Catchment Management Authority. This approach lacks any holistic, systems-wide focus and is cumbersome, localised and ineffective. Because CEWH water cannot be delivered under Commonwealth rules in Victoria, Basin Plan outcomes risk being compromised.[14]

Proprietary Rights and Menindee Lakes

Commonwealth environmental water currently changes ownership when it is managed through the Menindee Lakes system. The Victorian Government established the Menindee Lakes Trial Entitlement to hold Victoria's share of Commonwealth environmental water, to be managed by the Victorian Environmental Water Holder. This arrangement adds a level of complexity in environmental water management which compromises the capacity to achieve positive environmental outcomes.[15] The CEWH should be free to use environmental water from Menindee Lakes in accordance with its mandate and independence as the statutory agency responsible for environmental water for the entire Murray–Darling Basin. The complexity and inefficiency of current arrangements, whereby a Victorian government agency is responsible for delivering what had been Commonwealth environmental water to achieve environmental outcomes in the New South Wales lower Darling and Great Darling Anabranch, beggars belief. Our understanding is there is no legal basis that requires Victoria to use its Menindee water for environmental purposes downstream in New South Wales and South Australia.

Environmental water substitution

Suspension of water releases during droughts under the New South Wales Extreme Events Policy[16] impedes use of CEWH environmental water at times when flows are most needed and may be the only source of water available.[17] During droughts, water quality risks may exceed provisions in WSPs for mitigating them, and calls are made on CEWH Held Environmental Water to provide flows. This process, whereby river operators force environmental water managers to use Held Environmental Water for operational purposes that would normally be met by Planned Environmental Water is known colloquially as 'substitution'. It undermines the capacity to use Held Environmental Water for the purpose it was intended (e.g. providing

14 CEWH (2026) Commonwealth Environmental Water Holder submission on the 2026 Murray–Darling Basin Plan Review Discussion Paper. Office of the Commonwealth Environmental Water Holder, Department of Climate Change, Energy, the Environment and Water, Canberra, p. 23. https://www.dcceew.gov.au/sites/default/files/documents/cewh-submission-md-basin-plan-review.pdf

15 CEWH (2026) Submission to the Menindee Review – Have Your Say – April 2026. Office of the Commonwealth Environmental Water Holder, Department of Climate Change, Energy, the Environment and Water, Canberra. https://www.dcceew.gov.au/sites/default/files/documents/cewh-submission-menindee-review.pdf

16 NSW DCCEEW (2025) Extreme events policy. Policy framework for the management of NSW water resource during extreme events. New South Wales Department of Climate Change, Energy, the Environment and Water, Sydney. https://publications.water.nsw.gov.au/watergroupjspui/bitstream/100/3705/1/au-extreme-events-policy.pdf

17 CEWH (2024) Matter 7 Overview Report. Commonwealth Environmental Water Holder. Department of Climate Change, Energy, the Environment and Water, Canberra. https://www.mdba.gov.au/sites/default/files/publications/commonwealth-environmental-water-holder-matter-7-overview-report.pdf

flooding flows to wetlands). It is a deliberate, routine process and this situation particularly detrimentally affects the Border Rivers, Namoi, Macquarie–Castlereagh and Lachlan catchments. New South Wales Water Sharing Plans for northern Basin rivers do not address hydrological connectivity needs, not just in dry times but at all times, risking further environmental decline (NRC 2019, p. 1; Dula et al. 2024, p. v).[18] The practice of environmental water substitution must be curtailed.

Recommendations

1. We recommend the *Water Act* 2007 (Cth) and Murray–Darling Basin Agreement, which is incorporated into the *Water Act*, be amended to enable CEWH to retain its independence in the use, operations and decision making over its environmental water entitlements in Victoria.
2. We recommend the Murray–Darling Basin Agreement and the *Water Act* 2007 (Cth) be amended so the Victorian Menindee entitlement is re-allocated to the Commonwealth Environmental Water Holder.
3. We recommend that environmental water substitution be made unlawful under the *Water Act* 2007 (Cth).

The definition of an Environmentally Sustainable Level of Take

Under the *Water Act*, the ESLT is the baseline standard used to establish how much water can be extracted from the Murray–Darling Basin for consumptive use without compromising key ecological assets. The ESLT is an annual average volume based on historical modelled outputs. This is inadequate for sustaining ecosystem health, particularly in a changing climate where there are shifts in the timing of flow events as well as volumes. The ESLT needs to be sufficient to protect the minimum flow requirements (e.g. the volumetric, temporal, seasonal and qualitative characteristics of flow regimes). This could be achieved by amending the *Water Act* as follows:

Recommendations

1. Define environmental water requirements (EWRs) that will not compromise ecosystems including key flow components (e.g. baseflows, small/large freshes, bankfull, overbank) at all times (dry, average and wet).
2. Include EWRs in the definition of an ESLT and require MDBA to define them based on best available science. In determining whether a long-term average SDL reflects an environmentally sustainable level of take, we recommend that the Authority must determine the environmental flow requirements of the relevant water resource and ensure that the proposed limit does not compromise the achievement of those requirements. The Long-term Watering Plans are a key resource for EWRs. The MDBA 2011 ESLT report identified EWRs

18 Dula, A., Duncan, P., Sheldon, F., Smith, C., Southwell, M. and Townsend, P. (2024) Connectivity Expert Panel final report. NSW Department of Climate Change, Energy, the Environment and Water, Sydney. https://www.water.nsw.gov.au/sites/default/files/2025-08/connectivity-expert-panel-final-report-july-2024.pdf NRC (2019) Review of the Water Sharing Plan for the Barwon–Darling Unregulated and Alluvial Water Sources 2012. New South Wales Natural Resources Commission, Sydney. Available at: https://www.nrc.nsw.gov.au/Barwon-Darling

at hydrologic indicator sites.[19] However, this was a one-off exercise not a binding legal standard. CSIRO advised MDBA that the proposed SDLs in the 2011 report were 'highly unlikely to meet the specified ecological targets even in the absence of future climate change', the methods 'were not fully documented' and 'undocumented assumptions and modelling choices are a source of uncertainty in SDL determination.'[20] The SDLs were adopted regardless. Independent research since has found most designated EWRs remain unachieved, including in the decade since the Basin Plan was legislated.[21] What is missing is not the technical capacity to define EWRs but the requirement that EWRs be legally binding and periodically updated as conditions change.

3. Ensure the EWRs reflect flow requirements. These requirements must be calculated based on environmental science without attempting to optimise socio-economic considerations under a triple-bottom-line interpretation.
4. Low flows and river connectivity are not adequately protected under current arrangements, particularly during drought. The 2019 Barwon River cease-to-flow event — over 200 days without flow, averted from being substantially longer only by discretionary use of 36 GL of Commonwealth and New South Wales held environmental water (Discussion Paper §4.5.3) — illustrates that connectivity currently depends on ad hoc intervention rather than binding minimum protections. We recommend minimum flows be legally protected through a tiered EWR classification, embedded within Basin planning frameworks:
    a. Low-flow EWRs are defined as minimum flows and classified as Planned Environmental Water (PEW) — a binding legal floor that must remain in the system at all times, not subject to trade or discretionary allocation.
    b. Medium-flow EWRs become targets for the Commonwealth Environmental Water Holder (CEWH), guiding how held entitlements are actively managed and delivered to achieve ecosystem-function outcomes above the legal minimum, rather than being treated as a further binding floor.
5. Make the environmental flow requirements legally enforceable by creating a statutory rule that an SDL cannot be set at a level that prevents mandatory environmental flow requirements from being achieved. Require water resource plans to give effect to the EWRs.
6. Add a statutory review trigger. If monitoring demonstrates that an environmental flow requirement specified in the Basin Plan has not been achieved for the period or frequency specified for that requirement, the Authority must assess whether the relevant SDL continues to reflect an environmentally sustainable level of take.

19 MDBA (2011) The proposed "environmentally sustainable level of take" for surface water of the Murray-Darling Basin: methods and outcomes. Murray–Darling Basin Authority, Canberra. https://www.mdba.gov.au/sites/default/files/publications/eslt-mdba-report.pdf

20 Young, W.J., Bond, N., Brookes, J., Gawne, B. and Jones, G.J. (2011) Science review of the estimation of an Environmentally Sustainable Level of Take for the Murray–Darling Basin. CSIRO Water for a Healthy Country National Research Flagship, Canberra. https://doi.org/10.4225/08/584c433614101

21 Sheldon, F., Rocheta, E., Steinfeld, C., Colloff, M.J., Moggridge, B., Carmody, E., Hillman, T., Kingsford, R.T. and Pittock, J. (2024) Are environmental water requirements being met in the Murray–Darling Basin, Australia? *Marine and Freshwater Research* 75, article no. MF23172. https://doi.org/10.1071/MF23172

Establish a climate-indexed permitted take framework, linking annual extraction decisions to observed inflow trends.

The Commonwealth should be required to maintain and publish a rolling 20-year historical inflow index for each surface water catchment in the Basin, updated annually. This would build directly on data infrastructure MDBA and the Bureau of Meteorology already operate under Part 7 of the Act, including the National Water Account (s122). Unlike the current long-term average baseline used to set Sustainable Diversion Limits — frozen against the historical record at a single point in 2012 — a rolling index would provide a continuously updated, climate-adjusted signal.

The Murray Mouth

Even when the Basin Plan is fully implemented, the Water Act Part 2AA's objective of "ensuring the mouth of the River Murray is open without the need for dredging in at least 95% of years, with flows every year through the Murray Mouth Barrages;" (s86AA (2) (c)) will not be possible to achieve without significantly more river flow, permanent dredging and/or other major interventions. It is only during periods of unregulated flow (i.e. floods) that the Murray mouth has been scoured open by river flows (e.g. 2010, 2016; Figure 1). At other times, dredges are required to maintain an open Murray mouth, given the power of the sea in bringing sand into the mouth (e.g. 2003 to 2006 and 2014 to 2015) at a cost of about $6 - 7 million per year.[22] Even with one dredge in operation, there was a net sand accumulation into the mouth due to very low barrage flows (e.g. 2006 to 2010).

Since the construction of the barrages in the 1930s, large quantities of sand have accumulated between the mouth and the barrages, further restricting egress of river water through the mouth when being released over the barrages. This sand accumulation has formed a continually growing flood tidal delta that includes Bird Island.[23] A report commissioned by the South Australian Government in 2017 showed the rate of sediment inflow from the sea is around 2,250m^3 per day based on surveys between June 2015 and July 2016.[24] During winter 2016, a larger than usual number of severe storms contributed to higher ocean levels, Murray mouth sedimentation and shoal development.[24] Data provided on volumes dredged for 2015-16 indicate the necessity for two dredges to sustain an open mouth. Given continued onshore sand transport to the mouth, it is unlikely that targets for an open Murray mouth can be met in the future without dredging.

Freshwater flow through the barrages as well as an open Murray mouth is necessary to sustain the ecological health of the tidally-flushed north Coorong and the more saline south Coorong. We recommend Part 2AA of the Water Act should also reflect the Basin Plan objective: "the Murray Mouth remains open at frequencies, and for durations, sufficient to ensure that the tidal exchanges maintain the Coorong's water quality (in particular salinity levels) within the tolerance of the Coorong ecosystem's resilience" (Basin Plan s8.06 (d)).

22 Aither, 2017. MDBA expenditure review. A review of MDBA expenditure and cost sharing in New South Wales. WSP Parsons Brinkerhoff and Aither.
23 Bourman, B. and Harvey, N., 1983. The murray mouth flood tidal delta. Australian Geographer. 15(6): p. 403-406.
24 Teakle, I., 2016. Murray Mouth Dredging Review - 2016. BMT WBM: Brisbane.

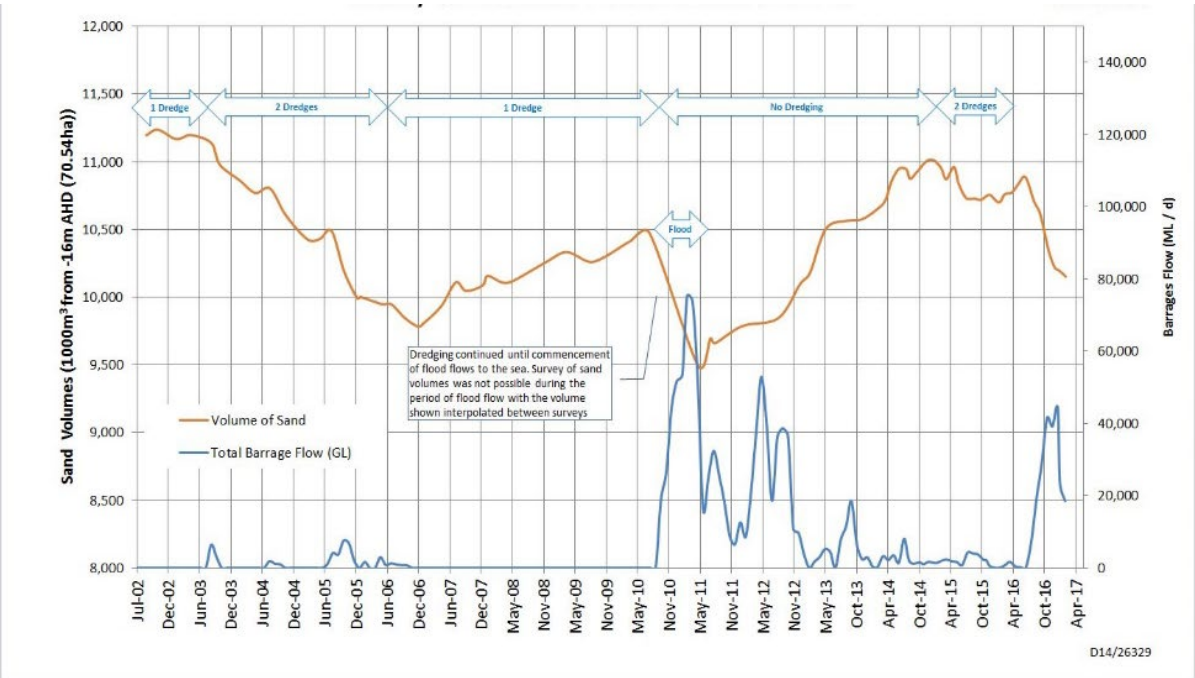

Figure 1. Barrage flow, sand volumes and dredging of the Murray mouth between 2002 and 2017. Supplied by the former South Australian Department of Environment and Natural Resources.

Recommendations

1. We recommend revising s86AA (2) (c) to 'ensuring the mouth of the River Murray is open in at least 95% of years, with flows every year through the Murray Mouth Barrages', by removing the phrase ' without the need for dredging.'

7. Communities, social and economic outcomes and water security

This section considers the broader community and socioeconomic dimensions of Q7 and Q8. Q7: What are the opportunities for the *Water Act* to support social and economic outcomes, including for First Nations? The First Nations part of Q7 is addressed in Section 2 above. Q8: To what extent are arrangements under the *Water Act* appropriate to ensure resilient communities and provide water security?

The arrangements under the *Water Act* are not appropriate to ensure resilient communities or provide water security because the *Act* does not effectively address measures for the need to adapt to climate change. As mentioned in Section 4, Recommendation 5 above, ensuring resilient communities and water security need a regional component of governance, particularly in New South Wales, that is capable of co-ordinating and linking requirements of communities and their options for adaptation through to state and commonwealth agencies to implement change.

There is an urgent need for environmental water managers and irrigation communities to adapt to the reality of less water. For wetlands, environmental triage is happening by default: wetlands

that will become drylands under climate change are not being watered.[25] Hard decisions will need to be made about which wetlands can no longer be supported with managed environmental flows and will need to be left to transition to dryland ecosystems. Some irrigators have begun to adapt by diversifying income sources, adding value to produce, trading water and reducing input costs, as they showed considerably capacity to do so during the Millennium Drought.[26] If we don't adapt now, adaptation becomes much harder, less effective and more expensive for everyone. The *Water Act* is effectively silent on arrangements to address these issues effectively.

Recommendation

We recommend inserting an explicit object, and a matching requirement in section 21, that the Basin Plan and Water Resource Plans must identify and respond to climate risks.

We have also submitted the Wentworth Group's *Blueprint for the next Murray–Darling Basin Plan* (2026), which includes several recommendations on supporting communities through transition. Please refer to that document for further community-related recommendations.

8. Water quality and ecosystem health

This section responds principally to Q9: To what extent are arrangements under the *Water Act* appropriate to address current and future challenges in relation to water quality?

There are two issues here: water quality of (a) rivers and wetlands and (b) drinking water supply. We do not consider arrangements are adequate to address current and future challenges regarding water quality.

Water quality of rivers and wetlands

Publicly available data on water quality of rivers and wetlands is limited. For the MDB, it includes only sites along the River Murray monitored under the River Murray Water Quality Monitoring Program. Data from at least one location (e.g. Morgan) is only obtainable from the MDBA on request. This is symptomatic of a broader problem. The MDBA is formally responsible for under S13.03 of the Basin Plan for collecting and providing open access to monitoring data, but in practice collection, curation and synthesis of this data remains incomplete, decentralised, and often not publicly available.

Poor water quality due to over-extraction, climate change and water mismanagement has been the cause of major fish kills. The annual number of fish kill events in the New South Wales Basin increased from a mean of 1.3 to 3.9 between 2012–13 and 2022–23, with six very large fish kills (over 100,000 individuals) recorded in that period compared with only two in the

25 Schweizer V, Colloff MJ, Pittock J (2022) The dammed and the saved: a conservation triage framework for wetlands under climate change in the Murray–Darling Basin, Australia. *Environmental Management* 70, 549–564. https://doi.org/10.1007/s00267-022-01692-x

26 Kirby, M., Bark, R., Connor, J., Qureshi, M.E. and Keyworth, S. (2014) Sustainable irrigation: how did irrigated agriculture in Australia's Murray–Darling Basin adapt in the Millennium Drought? *Agricultural Water Management* 145, 154–162. https://doi.org/10.1016/j.agwat.2014.02.013

preceding 12 years — including the 2019–20 and 2023 mass fish kills at Menindee Lakes.[27] On broader water-quality threat tracking, the MDBA has begun some public reporting since October 2020, so reporting arrangements are at least partially in place.

Drinking water quality

Without publicly available data it is impossible to assess whether water quality guidelines are being exceeded. Data on drinking water quality is not made public across the Basin.[28] In New South Wales it is held by NSW Health on behalf of water utilities companies and access is restricted.[29] NSW Health 2026).

Recommendations

1. Public reporting of poor water quality events and fish kills. We recommend formalising, extending and guaranteeing continuity of MDBA reporting on water quality incidents. The current reporting structure has no statutory basis and only a short public record. We also recommend the MDBA be responsible for reporting on fish kills for the entire Basin (currently reported for the NSW Basin, but not fully publicly available).[30]
2. Compulsory public reporting of data on drinking water quality. A compulsory, standardised public reporting requirement for urban water quality testing to close the gap between the stated transparency obligations in the A*ct* and current practice.
3. Clarify that PEW must be adequate for water quality. The *Water Act* should be amended to state explicitly that PEW must be set at a level adequate to maintain water quality as a baseline regulatory function, not as a discretionary issue.

9. Water information, science, modelling and transparency

This section responds principally to Q10: Is water information management appropriate for future decision-making, particularly under climate change?

Water information management is not appropriate for future decision making, especially under climate change because it is complex, fragmented and data and models are often not publicly accessible. The information available at present cannot be used effectively for climate adaptation planning. Current water information models and accounting, particularly with regard to those used for setting of SDLs and ESLTs, is not underpinned by realistic, scientifically validated projections of likely climate change in the Basin. This situation was apparent from the climate change projections used for the review of the Basin Plan and the assessment of whether the SDLs reflect an ESLT and address climate risks under future climate scenarios.[31]

27 Colloff, M.J. *et al.* (2024)
28 Colloff, M.J., Lanyon, K., Pittock, J., Costanza-van den Belt, M., Wheeler, S., Grafton, R.Q., Williams, J., Sheldon, F., Kingsford, R.T., Bino, G., Renzullo, L., Moggridge, B.J. (2024) Murky waters running clearer? Monitoring, reporting and evaluation of the state of the Murray–Darling Basin after more than three decades of policy reform. *Marine and Freshwater Research* 75(18), article no. MF 24193 https://doi.org/10.1071/MF24193
29 NSW Health (2026) NSW drinking water database. NSW Health, Sydney. https://www.health.nsw.gov.au/environment/water/Pages/drinking-water-database.aspx
30 DPIRD (2026) Fish kills in NSW. Department of Primary Industries and Regional Development, Sydney. Available at: https://www.dpi.nsw.gov.au/fishing/habitat/threats/fish-kills
31 MDBA (2026) 2026 Murray–Darling Basin Plan review. Discussion paper. Murray–Darling Basin Authority, Canberra, p. 19. https://www.mdba.gov.au/sites/default/files/publications/2026-murray-darling-basin-plan-review-discussion-paper.pdf

These scenarios fail to account for more rapid increases in global heating than a decade ago[32] and underestimate the effect that increased temperature will have on increased rates of evapotranspiration of irrigated crops that will require greater volumes of irrigation water to produce the same amount of yield.[33]

Recommendation

We recommend the *Water Act* be amended to require, in S21, that information and science on hydroclimatic risk due to the effects of climate change should shift from periodic assessments, such as the decadal Basin Plan review, to continuous assessment and regular updates of datasets, models and outputs based on realistic projections of future climate.

10. Alignment of the *Water Act* with the National Water Agreement

This section responds principally to Q11. What are the opportunities for the *Water Act* to align with the objectives set out in the National Water Agreement?

By applying the recommendations made throughout this submission, the Water Act could improve its alignment with objectives of the NWA such as water management that recognises and protects Aboriginal and Torres Strait Islander water interests and values (Objective 3), and environmentally sustainable water planning and management that is interconnected, adaptive and responsive to climate change (Objective 6). As a result, these amendments would deliver real ecological outcomes.

Recommendations

Embed climate change throughout water planning

Climate change should become a central design principle for water management rather than an external risk. Planning frameworks should include adaptive triggers, climate-responsive allocation rules, protection of critical human and environmental water needs, and improved management of groundwater and surface water interactions.

Improve governance and accountability

Governments require stronger accountability mechanisms to ensure agreed reforms are delivered. This includes:

stronger performance reporting;

independent auditing;

transparent modelling;

improved compliance arrangements;

32 Ripple, W.J., Wolf, C., Rockström, J., Richardson, K., Wunderling, N., Gregg, W., Westerhold, T. and Schellnhuber, H.J. (2026) The risk of a hothouse Earth trajectory. *One Earth* 9(2), article no. 101565. https://doi.org/10.1016/j.oneear.2025.101565 Foster, G., and Rahmstorf, S. (2026) Global warming has accelerated significantly. *Geophysical Research Letters* 53, article no. e2025GL118804. https://doi.org/10.1029/2025GL118804

33 Petrie, P. and Hall, A. (2025) The impact of climate change on crop irrigation requirements across the Murray–Darling Basin. One Basin CRC. https://onebasin.com.au/wp-content/uploads/2026/07/20250616-Final-Report-Predicting-the-impact-of-climate-change-on-irrigation-demand-across-the-One-Basin.pdf.

maintaining the independence of institutions such as the Commonwealth Environmental Water Holder; and

clearer Commonwealth powers where jurisdictions fail to deliver agreed commitments.

11. Additional reforms not adequately captured by the questions in the *Water Act* Review Discussion Paper

The Water Act should establish a state and federal legislation framework requiring periodic, time-limited relicensing of water infrastructure, consistent with the regulatory model proposed by Pittock and Hartmann (2011).34 in their comparative study of dam management in Australia, China, France and the United States. Under this model, every 30 years an infrastructure owner would be required to demonstrate to an independent public review body that their dam, levee or canal:

a) is safe, meeting all current regulatory standards;
b) continues to perform a valuable socio-economic function; and
c) has all reasonable social and environmental impact reduction measures in operation (e.g. fish passage, thermal pollution control, and other best-available technologies to maximise environmental and socioeconomic performance).

Following this assessment, the regulator would be empowered to:

a) relicense the infrastructure for a further 30-year period;
b) direct reoperation, requiring the installation of reasonable social and environmental impact reduction measures as a condition of continued operation; or
c) require removal of the infrastructure.

Periodic relicensing overseen by an independent regulatory agency, operating through a transparent process with public participation and taking decisions in the public interest, is a key element of an effective regulatory system for optimising water infrastructure performance — and that dam renovation under such a system can not only address existing non-climate impacts but help attenuate some climate change impacts on freshwater biota.

[34] Pittock, J. and Hartmann, J. (2011)Taking a second look: climate change, periodic relicensing and improved management of dams." Marine and Freshwater Research 62(3): 312–320. https://doi.org/10.1071/MF09302]