

28 April 2026

Dear Productivity Commission staff,

Thank you for the opportunity to make an initial submission to the National Water Reform 2026 inquiry. Thank you also for the short extension to the submission date to accommodate this contribution. This submission is authored by a group of law and policy researchers at the Melbourne Centre for Law and the Environment, Melbourne Law School, University of Melbourne. We would be pleased to discuss any aspects of the research referred to in this submission, or provide copies of publications on request.

We note that under section 88(2) of the *Water Act 2007* (Cth), the Productivity Commission's inquiry addresses 'the progress of parties to the National Water Initiative ['NWI'] towards achieving the objectives and outcomes of ... the [NWI]'. We also note that the new National Water Agreement has been signed by the Commonwealth and is now with states and territories for signing. In this context, we understand that the Productivity Commission may seek to consider what the progress of Australian jurisdictions in relation to the objectives and outcomes of the NWI suggests about issues that will deserve special attention in the implementation of the National Water Agreement.

In this context, we direct this submission to the following terms of reference:

- the **perspectives and socio-cultural rights of Aboriginal and Torres Strait Islander Peoples;**
- regional and **equity considerations**, both as relevant to water services and to water management more generally, noting that mention of equity is conspicuously absent from the NWI, but that, as discussed here, equity appears an almost universal element of Australian states' and territories' water-related laws;
- the progress of Australian jurisdictions in relation to the following objectives and outcomes of the NWI:
  - **integrated management of environmental water** (clauses 78-79 NWI), which we address with particular emphasis on **groundwater**;
  - addressing **risks of climate change**, which runs across NWI objectives and outcomes related to knowledge and capacity building about changes in water availability (clause 98, NWI), water planning (Sch E, NWI), and assignment of risks of reductions to the consumptive pool (clause 48, NWI).

### Summary of recommended issues for discussion paper

This submission makes the following five recommendations for areas of focus for Australia's states and territories, based on evidence of progress towards NWI objectives and outcomes and issues of importance under a future National Water Agreement:

1. **Increase attention to groundwater, especially in the context of climate change:** renew and deepen Australian jurisdictions' policy focus on groundwater management, including groundwater in the context of the impacts of climate change, to enable

Australian jurisdictions to take advantage of important opportunities and respond in a considered way to important risks;

2. **Increase attention to climate change mitigation and adaptation in water management more generally**, including under Australia's international obligations and in the transition to Net Zero;
3. **More clearly and transparently operationalise existing obligations to consider equity in water management**; although such obligations are common in the states' and territories' water laws, they seldom include the practical processes or transparency measures needed for effective implementation;
4. **Increase water rights held by Indigenous organisations** for any use (including commercial use) and invest in **genuine partnerships between water and catchment managers and Traditional Owners and First Nations**; and
5. **Better integrate management of water, land and other parts of the environment**, reflecting First Nations perspectives and regulatory best practice in managing cumulative impacts on water systems.

Our fuller recommendations follow, at pages 3-18 of this document, followed by a reference list.

We thank you for considering our submission.

Sincerely,

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## Recommendation 1: Increase attention to groundwater, especially in the context of climate change

This recommendation draws from published research as well as research in progress that evaluates how Australian jurisdictions' water law, policy and plans respond to climate-driven risks to groundwater systems.<sup>1</sup> As well as addressing the NWI terms of reference, it will be relevant to Outcome 6D of the future National Water Agreement – 'Water planning processes enhance the resilience and adaptability of water systems to the impacts of a changing climate.'

### **National attention to groundwater lags behind surface water, and practitioners and recent evidence reveal concerns about the robustness of current approaches to groundwater**

National water policy has largely considered groundwater as an 'add on' to dominant concerns about surface water. The policy lifetime of the 'National Groundwater Strategic Framework' (2016-2026)<sup>2</sup> is now at an end. Yet the need to focus on groundwater is only increasing. A recent survey of 95 groundwater practitioners from across Australia identified key problems in Australian groundwater management: practitioners ranked as most difficult the determination of sustainable regional extraction limits; determining and implementing drawdown limits, and determining water needs of ecosystems, were also major practical problems.<sup>3</sup>

Additional evidence points to further issues in groundwater management across jurisdictions. Issues of significant localised groundwater drawdown in areas of New South Wales, Queensland, South Australia and Victoria are considered to lie outside the scope of the 2026 review of sustainable diversion limits in the Basin Plan for the Murray-Darling Basin on the basis that these risks are 'best addressed through Basin state groundwater management frameworks' rather than by changing sustainable diversion limits.<sup>4</sup> Yet without sustained policy attention, it is unclear that state frameworks will effectively address these risks.

Important additional issues relating to Aboriginal and Torres Strait Islander Peoples are canvassed in Recommendation 4 below.

### **Climate change increases the importance of groundwater for water security, while simultaneously multiplying risks to groundwater; this heightens the imperative to strengthen groundwater policy to safeguard it from overuse**

Activities linked to climate change mitigation (e.g. mining of critical minerals for the energy transition) can place groundwater under increasing stress, alongside other cumulative impacts on the resource caused by other developments (e.g. growing use of groundwater for data centres). Climate change itself threatens access to groundwater resources for communities and ecosystems dependent on these resources by changing recharge, in the case of coastal

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<sup>1</sup> Research in progress: 'Climate Risks and Groundwater Law' (R Nelson, D Perrone, HM Reza), funded by the Melbourne Climate Futures Climate Research Accelerator, <<https://www.unimelb.edu.au/climate/expertise/crx-projects#2projects-026>>. Further information available on request.

<sup>2</sup> Australian and State and Territory Governments, 'National Groundwater Strategic Framework 2016-2026' (Policy, 2016) <<https://www.dcceew.gov.au/water/policy/policy/nwi/national-groundwater>>.

<sup>3</sup> See generally Peter G. Cook et al, 'Sustainable management of groundwater extraction: An Australian perspective on current challenges' (2022) 44 *Journal of Hydrology: Regional Studies* article 101262.

<sup>4</sup> Murray-Darling Basin Authority, '2026 Murray-Darling Basin Plan Review: Discussion Paper' (Discussion Paper, 2026) 30 <<https://www.mdba.gov.au/sites/default/files/publications/2026-murray-darling-basin-plan-review-discussion-paper.pdf>>.

freshwater aquifers, causing saltwater contamination through sea level rise and storm surges, among a wide range of other effects (see Table 1).

At the same time, groundwater becomes increasingly valuable under climate change as a resource that is less variable than surface water. Groundwater acts as an ‘insurance policy’ for dry times—supporting the climate resilience of ecosystems and communities—as experience during the Millennium Drought clearly showed. Periods of drought will drive increasing demand for groundwater at the same time as groundwater systems experience direct climate-driven pressures of varying types (Table 1).

**Evidence of piecemeal, ad-hoc recognition of climate risks to groundwater across Australia warrants a coordinated national policy response—both to fully identify risks, and to adopt policy responses to address them**

Across Australia, a few jurisdictions are beginning to recognise the seriousness of potential increased demand for groundwater driven by climate change. We have reviewed 19 state-level plans, policies and strategies across Australia (pre-publication research; list available on request). Only three provide more than passing discussion of this issue:

- The *NSW Groundwater Strategy (2022)* provides some of the most detailed projections, anticipating overall groundwater demand to climb by more than 22% within two decades,<sup>5</sup> with urban use forecast to triple, irrigation to grow by over a quarter, and industrial and intensive rural uses rising sharply, all driven by population growth and a more variable climate.<sup>6</sup>
- The *Rural Water Use Strategy (2021)* (Tasmania) also recognises a direct link between the exhaustion of surface water resources and increased groundwater demand. It notes ‘(a)s surface water catchments reach full allocation, demand for groundwater as an alternative or additional source of water for irrigation and other uses may increase.’<sup>7</sup>
- Victoria’s *Groundwater Management 2030* strategy acknowledges that groundwater already supplies approximately 15% of the state’s water needs and is under increasing pressure as climate change reduces the recharge of aquifers. It points to the Millennium Drought as a striking preview of what lies ahead: as rainfall and surface water dried up, groundwater uses surged, only to fall again when the 2010–11 floods returned. In a hotter, drier future, that drought-era pattern may become the new normal.<sup>8</sup>

In addition to forecasting increasing groundwater demand, states and territories identify several other climate-driven risks through their plans, policies and strategies. For example, the *NSW Groundwater Strategy (2022)* identifies climate risks that include reduced groundwater recharge,<sup>9</sup>

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<sup>5</sup> New South Wales Department of Planning and Environment, *NSW Groundwater Strategy* (NSW Government, December 2022) 23 <<https://www.water.dccceew.nsw.gov.au/our-work/plans-and-strategies/nsw-groundwater-strategy>> (‘NSW Groundwater Strategy’).

<sup>6</sup> *Ibid* 8.

<sup>7</sup> Tasmanian Government, *Rural Water Use Strategy (2021)* 8.

<sup>8</sup> Victorian Department of Environment, Land, Water and Planning, *Groundwater Management 2030* (2020) 6 <<https://www.water.vic.gov.au/water-sources/groundwater/groundwater-management-2030>>.

<sup>9</sup> NSW Groundwater Strategy, above n 5, 32.

increased demand,<sup>10</sup> saltwater intrusion,<sup>11</sup> and water quality degradation.<sup>12</sup> It projects that diffuse recharge will decrease by 15% on average across the state by 2060, while overbank flooding recharge in parts of the Murray-Darling Basin (MDB) could drop by 50% to 80%.<sup>13</sup> The *Queensland Water Planning Science Plan (2020–2030)* identifies, inter alia, increased groundwater temperature,<sup>14</sup> species endangerment,<sup>15</sup> and altered spring discharge.<sup>16</sup> *Victoria's Water Cycle Adaptation Action Plan (2022–2026)* identifies reduced recharge,<sup>17</sup> drought, and decreased streamflow.<sup>18</sup>

The degree to which some jurisdictions have recognised climate-driven risks to groundwater suggests that a broader range of jurisdictions should seriously consider these risks, and indeed, a broader range of climate-driven risks. Table 1 provides a summary list of areas of climate risk to groundwater drawn from the scientific literature, with sample supporting research.

**Despite recognising risks, there is little evidence that jurisdictions have undertaken sustained work to formulate policy responses, even in high-level strategies that give significant attention to groundwater risks.** Some examples of the greatest attention to policy implications in our review include the following examples:

- The *NSW Groundwater Strategy (2022)* commits to refreshing and expanding the state's groundwater policy framework and focuses on reviewing extraction limits using the latest climate and ecological data.<sup>19</sup> It also highlights an array of technologies and innovative solutions 'to make the best use of our groundwater resources, increase groundwater availability and secure supply to communities and industries.'<sup>20</sup> But at the same time, it notes 'a lack of information about groundwater sources and their interactions with seawater along our coasts', and that '(t)his information is essential to ensure future management decisions can adapt to these impacts.'<sup>21</sup> The strategy also acknowledges that applying new climate data to actual water sharing and allocation decisions requires 'further work'.<sup>22</sup>
- The *Queensland Water Planning Science Plan (2020–2030)* provides no policy corresponding to the identified risks. Quantitative science to support Environmental Water Requirements for GDEs is described as being in its 'infancy'.<sup>23</sup>

<sup>10</sup> Ibid 23.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid 39.

<sup>13</sup> Ibid 32.

<sup>14</sup> Queensland Department of Regional Development, Manufacturing and Water and Department of Environment and Science, *Queensland Water Planning Science Plan 2020–2030* (State of Queensland, 2020) 39 <<https://wetlandinfo.detsi.qld.gov.au/resources/static/pdf/assessment-toolbox/water-planning-science-plan-2020-2030.pdf>> ('Queensland Water Planning Science Plan').

<sup>15</sup> Ibid 37.

<sup>16</sup> Ibid 35.

<sup>17</sup> Victorian Department of Environment, Land, Water and Planning, *Water Cycle Adaptation Action Plan 2022–2026* (2022) [https://www.climatechange.vic.gov.au/\\_\\_data/assets/pdf\\_file/0025/558421/DELWP0220-water-system-climate-change-adaptation-plan.pdf](https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0025/558421/DELWP0220-water-system-climate-change-adaptation-plan.pdf) ('Victorian Water Cycle Adaptation Action Plan').

<sup>18</sup> Ibid 20

<sup>19</sup> NSW Groundwater Strategy, above n 5, 7.

<sup>20</sup> Ibid 41.

<sup>21</sup> Ibid 54.

<sup>22</sup> Ibid 33.

<sup>23</sup> Queensland Water Planning Science Plan above n 14, 34.

- Although *Victoria's Water Cycle Adaptation Action Plan (2022–2026)* considers establishing research trials and decision-making frameworks, many risks are categorised as ‘cross-system,’ meaning they cannot be managed solely by the water sector and require collaboration with other sectors (like Health or Built Environment) that have their own adaptation plans.<sup>24</sup> It is unclear whether such collaborative policy-making is being undertaken.

Addressing climate change risks to groundwater will likely be challenging. Significant gaps in scientific knowledge and research capabilities persist and existing monitoring networks often have limited coverage.<sup>25</sup> Other challenges referenced by states include rapid population growth, aging infrastructure, and competing values.<sup>26</sup>

The Productivity Commission has acknowledged climate-driven groundwater risks, but national policy remains limited. The 2017 NWI module on climate-sensitive water planning notes the difficulties in south-west Western Australia<sup>27</sup> — and that is largely where its substantive response ends.

Across three successive National Water Reform inquiry reports (2017, 2021, and 2024), the Productivity Commission has given only limited attention to the impacts of climate change on groundwater:

- the 2017 report records that inquiry participants raised the ‘need for a better understanding of hydrology, groundwater in Northern Australia, effects of climate change at a catchment level across Australia.’<sup>28</sup> The report refers to the International Association of Hydrogeologists, which notes that better quantification of surface water–groundwater interactions ‘is especially relevant to drought and climate change planning.’<sup>29</sup>
- The 2021 report briefly recommends that water planners account for climate-driven reductions in groundwater availability.<sup>30</sup> It adds that in areas with ‘a high degree of uncertainty as to climate change impacts or the extent of surface water and groundwater systems, a risk-based approach would be conservative in providing access to unallocated water resources.’<sup>31</sup> The Commission recommends that a renewed NWI should explicitly include ‘the health of river and groundwater systems ... adapting to a changing climate.’<sup>32</sup>

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<sup>24</sup> Victorian Water Cycle Adaptation Action Plan, above n 17, 25-35.

<sup>25</sup> NSW Groundwater Strategy, above n 5, 31.

<sup>26</sup> See, ACT City and Environment Directorate, *ACT Water Strategy 2025–45* (2025) 20 (ageing infrastructure), 24 (competing values) [https://www.act.gov.au/\\_\\_data/assets/pdf\\_file/0012/3022212/act-water-strategy-2025-45.pdf](https://www.act.gov.au/__data/assets/pdf_file/0012/3022212/act-water-strategy-2025-45.pdf); Victoria's Water Cycle Adaptation Action Plan, above n 17, 5 (older infrastructure).

<sup>27</sup> Australian and State and Territory Governments, ‘Module to the National Water Initiative (NWI) Policy Guidelines for Water Planning and Management: Considering Climate Change and Extreme Events in Water Planning and Management’ (Policy Guidelines, 2017) 30-31, 38-39 <<https://www.dcceew.gov.au/sites/default/files/sitecollectiondocuments/water/climate-change.pdf>>.

<sup>28</sup> Productivity Commission, *National Water Reform* (Productivity Commission Inquiry Report No 87, 2017) 303.

<sup>29</sup> *Ibid.*, 372.

<sup>30</sup> Productivity Commission, *National Water Reform 2020* (Productivity Commission Inquiry Report No 96, 2021) 83 (‘PC National Water Reform 2020 Report’).

<sup>31</sup> *Ibid.*

<sup>32</sup> *Ibid.*

- The 2024 report links climate change to declining groundwater recharge: '(r)ising temperatures leading to higher evaporation will ... reduce the rates of groundwater recharge. These trends are driven by climate change and are forecast to accelerate further as the climate continues to warm.'<sup>33</sup> In addition, a chapter on 'water security in a changing climate' includes the key finding that: '(d)rying and changing climates are weakening the reliability of rainfall-dependent water sources, such as dams and groundwater, which supply the majority of Australia's water.'<sup>34</sup> The report separately notes: '(C)limate uncertainty is driving increasing concern about the security of climate-dependent water sources, like dams and groundwater...'.<sup>35</sup>

This inquiry presents an opportunity to urge supporting and developing meaningful policy on groundwater-specific climate adaptation under the umbrella of the National Water Agreement. meaningfully address the vulnerability of Australia's groundwater systems to accelerating climate change induced risks.

**Environmental groundwater entitlements are an overlooked adaptation mechanism that is already available, and would benefit from policy to guide further development and meaningful implementation**

A clear and important gap in Australian jurisdictions' implementation of climate-ready national water policy is the failure to fully develop the use of groundwater environmental entitlements; research suggests that they have important potential benefits for climate adaptation.<sup>36</sup> Environmental entitlements to groundwater are legally quantified rights to a volume of water or to a specified groundwater level that can be left in situ or actively used for ecological purposes. These entitlements give holders flexibility to buy, hold, transfer or use water in response to changing conditions, which helps fill knowledge gaps about groundwater-dependent ecosystems through local experiment and learning—as outlined above, the lack of sufficient knowledge of this type is a significant concern of groundwater practitioners across Australia. Under most state groundwater law frameworks already in place, environmental groundwater entitlements could be held by independent public bodies, NGOs or Indigenous groups, diffusing advocacy and enforcement of environmental protections away from politically constrained agencies and enabling culturally informed priorities to be defended. Groundwater environmental entitlements could also enable active measures—such as ecological pumping to support drought refuges or managed aquifer recharge—that can resist or direct ecological change when recharge falls under climate stress (see Table 1).

Entitlements work best when combined with rules-based approaches, monitoring and institutional support: entitlements offer fast, localised tools for adaptation, while rules provide broader coordination and safeguards. Their success depends on jurisdictional fit, available

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<sup>33</sup> Productivity Commission, *National Water Reform 2024* (Productivity Commission Inquiry Report No 105, 2024) 4 ('PC National Water Reform 2024 Report').

<sup>34</sup> *Ibid*, 95.

<sup>35</sup> *Ibid*, 99.

<sup>36</sup> See generally Rebecca Nelson, 'Water Rights for Groundwater Environments as an Enabling Condition for Adaptive Water Governance' (2022) 27(2) *Ecology & Society* article 28.

funding and infrastructure. Across different jurisdictions, diverse approaches to groundwater environmental entitlements emerge.<sup>37</sup> National policy emerges as a key way to guide jurisdictions in developing these intersecting mechanisms to support adaptation to climate impacts to groundwater.

Table 1: Risks to groundwater related to climate change

| Risk area                           | Brief description of risk area   | Example of policy recognising risk area                       |
|-------------------------------------|--|---|
| Reduced recharge / depletion        | Projected declines in aquifer recharge, storage, or availability due to decreased precipitation, rising temperatures, drought, or increased abstraction, e.g., Kuang et al. (2024).  | National Groundwater Strategic Framework 2016-2026 (National) |
| Increased groundwater recharge      | Observed or projected increases in aquifer infiltration driven by higher/intense rainfall, snowmelt, or warming that reduces ground frost, e.g., Taylor et al. (2013).   | NA  |
| Enhanced episodic recharge          | Irregular, event-driven recharge following intense rainfall or flooding, especially in semi-arid or tropical regions where normal annual recharge is low, e.g., Maliva (2021).   | NA  |
| Water level / water table changes   | Rises, declines, or fluctuations in groundwater levels caused by climate variability, extraction, sea-level rise, or altered recharge. Kuang et al. (2024) the depth of the water table determines the degree of vulnerability or responsiveness of groundwater systems to climate-driven stress, e.g. Costa, Zhang & Levison (2021) | Queensland Water Strategy (Qld)                               |
| Magnitude of groundwater resource   | Changes in overall groundwater availability due to altered snowmelt timing, precipitation patterns, and seasonal shifts under climate change, e.g., Taylor et al. (2013).  | NA  |
| Drought (affecting availability)    | Prolonged water deficit reducing precipitation, recharge, and groundwater availability, intensified by climate change, e.g., Taylor et al. (2013).   | Water for Victoria (Water Plan) (Vic)                         |
| Demand increases in groundwater     | Greater groundwater abstraction driven by drought, declining surface water, rising temperatures, and increased agricultural or municipal water needs, e.g., Maliva (2021).   | NSW Climate Change Adaptation Action Plan 2025–2029 (NSW)     |
| General groundwater quality changes | Climate-driven fluctuations in groundwater chemical concentrations including oxygen, pH, CO <sub>2</sub> , nitrate, and other contaminants, e.g., Adhikari et al. (2022).  | Water Cycle Adaptation Action Plan 2022–2026 (Vic)            |
| Nutrient loading                    | Elevated concentrations of nitrogen, phosphorus, silicon, arsenic, and manganese in groundwater due to climate-driven recharge and land-use changes, e.g., Davamani et al. (2024).   | NA  |
| Algal blooms and toxins             | Growth of harmful algal blooms driven by warming temperatures and nutrient loading (arsenic, manganese, phosphorus), e.g., Benz et al. (2024).   | NA  |
| Wildfire pollution                  | Groundwater contamination from climate-driven wildfires via ash, heavy metals, and organic compounds entering soil and altering groundwater chemistry, e.g., Richardson et al. (2024).   | NA  |
| Soil cracking                       | Soil shrinkage during drought creates preferential flow pathways, accelerating pollutant transport into groundwater during subsequent rainfall events, e.g., Richardson et al. (2024).   | Water Cycle Adaptation Action Plan 2022–2026 (Vic)            |
| Pesticide leaching                  | Climate-driven pest adaptation increases pesticide use, with compounds infiltrating groundwater via leaching and runoff, e.g., Richardson et al. (2024).   | NA  |
| Carbon leakage                      | CO <sub>2</sub> escaping from underground carbon storage sites, contaminating groundwater., e.g., Richardson et al. (2024).  | NA  |

<sup>37</sup> See generally Rebecca L Nelson and Debra Perrone, 'Environmental Groundwater Rights in the Western United States and Australia' (2025) 28 *Journal of Water Law* 190-194.

| Risk area                              | Brief description of risk area   | Example of policy recognising risk area     |
|--|--|---|
| Saltwater intrusion / salinisation     | Saltwater intrusion from sea-level rise, storm surges, and over-pumping of coastal aquifers; also includes inland salinisation from evaporation and irrigation, e.g., Kuang et al. (2024).   | Climate Adaptation Strategy (WA)            |
| Increased groundwater temperature      | Rising groundwater temperatures in shallow aquifers due to climate change, affecting dissolved oxygen, pH, contaminant mobility, and thermal regimes, e.g., Benz et al. (2024).  | 2020–2030 Water Planning Science Plan (Qld) |
| Surface water-groundwater interactions | Climate change reducing surface water availability, altering the exchange between rivers and aquifers, and increasing groundwater development pressures, e.g., Green et al. (2011).  | 2020–2030 Water Planning Science Plan (Qld) |
| Groundwater inundation                 | Flooding from below when a rising water table (driven by sea-level rise or heavy precipitation) exceeds land surface capacity, saturating soils, e.g., Kuang et al. (2024).  | NA  |
| Land subsidence                        | Lowering of land surfaces caused by declining groundwater levels from increased pumping, reduced recharge, or decreased aquifer pressure under hotter, drier climates, e.g., Maliva (2021).  | NA  |
| Ecosystems and endangered species      | Climate-driven changes in groundwater quality, depth, flux, and temperature adversely affect dependent aquatic ecosystems and groundwater-fed habitats, including through habitat loss and thermal stress, e.g., Benz et al. (2024). | NSW Groundwater Strategy (2022) (NSW)       |
| Thermal habitats                       | Groundwater as a thermal refuge for aquatic species, under increasing stress from climate-driven temperature rises; includes both negative and positive thermal effects, e.g., Costa, Zhang & Levison (2021).                        | 2020–2030 Water Planning Science Plan (Qld) |

## Recommendation 2: Increase attention to climate change mitigation and adaptation in water management more generally, including under Australia’s international obligations and in the transition to Net Zero

This recommendation draws on existing Productivity Commission recommendations about the pressing need to elevate climate change considerations in water planning and management, and points to international climate law developments to highlight further obligations to integrate climate considerations into Australia’s domestic regulatory frameworks.

Australia’s National Climate Risk Assessment highlights the impact climate change will have on already limited water resources, including water security risks from increased floods, fires and droughts, damage to water service and delivery infrastructure, and ecosystems.<sup>38</sup> The Assessment notes that ‘[e]ffective water management is one of few adaptation measures to mitigate ecosystem function risk’.<sup>39</sup>

The Productivity Commission has already outlined the threat climate change poses to ‘the access, use and management of water across Australia’.<sup>40</sup> In addition to an increase in extreme weather conditions, and impact on water supplies including dams and groundwater, the Commission points to the interaction between climate change and other water management challenges, including ‘planning for the role of water in developing liveable cities and towns and

<sup>38</sup> Australian Climate Service, *National Climate Risk Assessment* (Commonwealth of Australia, 2025) <https://www.acs.gov.au/pages/nkra-reports>.

<sup>39</sup> *Ibid*, 52.

<sup>40</sup> PC National Water Reform 2024 Report, above n 33, 95.

ensuring the long-term sustainability of water resources and environments to support community, economic and environmental objectives'.<sup>41</sup>

While water management and service provision should respond to (and 'should explicitly mention the need to adapt to'<sup>42</sup> a changing climate,<sup>43</sup> '[g]overnments have yet to incorporate climate planning into most water allocation plans or similar catchment-level instruments'.<sup>44</sup> However, while water is central to climate resiliency and at risk from a changing climate, mitigation measures also involve high water use which can compromise adaptation outcomes.<sup>45</sup> Water plays a central role in supporting the transition to net zero emissions by 2050 (committed to under *Climate Change (Net Zero Future) Act 2023* (Cth)) and meeting international obligations to limit global temperature increase to no more than 1.5 °C.<sup>46</sup> And while water is central to climate resiliency and at risk from a changing climate, mitigation measures also involve high water use which can compromise adaptation outcomes.<sup>47</sup>

On 23 July 2025, the International Court of Justice (ICJ) handed down its Advisory Opinion on the *Obligations of States in Respect of Climate Change* (ICJ AO).<sup>48</sup> While non-binding, ICJ Advisory Opinions provide an authoritative statement both of current international law, and of the rights of nations to seek reparations if those laws are breached. The ICJ AO outlines the climate-related international obligations and responsibilities of countries and makes it clear that they must act to combat climate change – and that failure to do so may lead to international legal liability (paras 431-2). Several findings of the ICJ AO are relevant for water reform:

- States' international obligations to address climate change come from a wide range of sources of international law beyond just the treaties of the climate regime, including customary law obligations to prevent environmental harm and to cooperate on shared global problems like climate change. Customary law obligations are binding on all nations.
- These international law obligations largely require states to exercise due diligence in adopting, implementing and enforcing domestic regulations to address climate harms (paras 137-8).
- States' climate measures should extend to regulating the greenhouse gas emitting activities of private actors (para. 427).
- Procedural duties in respect of climate change are not siloed within 'climate change' or 'energy' in any one ministerial portfolio but are comprehensive.<sup>49</sup>

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<sup>41</sup> Ibid.

<sup>42</sup> PC National Water Reform 2020 Report, above n 30, 6.

<sup>43</sup> Ibid; PC National Water Reform 2024 Report, above n 33.

<sup>44</sup> PC National Water Reform 2024 Report, above n 33, 106.

<sup>45</sup> MA Caretta et al, *Climate Change 2022: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2022), Chapter 4.

<sup>46</sup> PC National Water Reform 2024 Report, above n 33, 110-111.

<sup>47</sup> MA Caretta et al, above n 45, Chapter 4.

<sup>48</sup> International Court of Justice, *Obligations of States in Respect of Climate Change*, Advisory Opinion, 23 July 2025, ICJ Reports 2025.

<sup>49</sup> Ibid.

The international climate obligations on Australia outlined in the ICJ AO require heightened consideration of climate change in water management and service provision, adaptation, and the complex role of water in the transition to net zero.

### Recommendation 3: More clearly and transparently operationalise existing obligations to consider equity in water management

This recommendation is drawn from an August 2024 research review on the ways in which Australian water-related laws provide for concepts of equity.<sup>50</sup>

#### **The water laws of Australian jurisdictions frequently expressly uphold equity as a value, but do not provide the mechanisms or the transparency to ensure that it is operationalised**

Overall, among the jurisdictions studied in the research review (New South Wales, Northern Territory, Queensland, South Australia, Victoria, Commonwealth), water-related laws:

- adopt concepts of equity in a ubiquitous way, but those concepts are frequently expressed vaguely (often as objects or principles rather than operational rules);
- emphasise economic dimensions of equity (pricing, compensation, cost apportionment) more clearly than social, cultural or recognitional dimensions;
- diverge greatly in their ‘communities of concern’ for the purposes of equity considerations, often without explanation;
- can allow for significant spatial variation in what equity means because local instruments and plans can define and apply equity differently;
- impose duties on a wide range of decision-makers to consider equity in relation to water, including ‘ministers, independent panels, appointed committees that formulate water management plans, water corporations, independent statutory bodies or commissioners, technical consultants, etc’;
- typically impose weak duties on decision-makers in relation to equity (e.g. ‘consider’ or ‘have regard to’), leaving wide administrative discretion;
- provide limited judicial remedies or scrutiny of equity decisions, making transparency and policy guidance essential for accountability; and
- are beginning to show clearer, more prescriptive equity duties in recent climate and environment legislation in some jurisdictions, though less clearly in water laws.

The proposed National Water Agreement continues this pattern of making express reference to equity, though with little elaboration of what equity requires (Outcome 2A, cl 2.1.1; Outcome 2B, cl 2.9.3).

Australia’s water laws almost never expressly connect distributive, participatory or restorative notions of fairness with the situation of Aboriginal and Torres Strait Islander Peoples.

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<sup>50</sup> Rebecca Nelson et al, 'Water, Law and Concepts of Equity' (Report, 2024)  
<<https://watertrustaustralia.org.au/sites/default/files/2024-12/WaterLawConceptsOfEquity20231031.pdf>>.

Lack of law and policy clarity about what equity requires, or transparency about how decision-makers consider it in practice, is fundamentally problematic:

First, [lack of clarity] means that there is little recognition that equity has multiple dimensions that require resolution, that equity considerations may conflict with other considerations, and that for both reasons, decisions require trading off different dimensions and considerations against each other to resolve conflicts...

Second, confusion or uncertainty about what equity requires may discourage decision-makers from considering equity at all.

Third, the combination of ambiguity in legislative drafting, popular contestation about what fairness requires, the fact that equity concepts can deal with vulnerable groups who experience barriers to advocating for their interests, and the apparently limited utility of judicial review ... highlights the importance of transparency about how discretion is interpreted and applied by decision-makers to facilitate democratic accountability...<sup>51</sup>

The review concludes that '[t]here is a need for clear policy guidance and transparency about decisions that consider equity to facilitate appropriate public scrutiny of values-rich decisions'.<sup>52</sup>

#### Recommendation 4: Increase water rights held by Indigenous organisations for any use (including commercial) and invest in genuine partnerships between water and catchment managers and Traditional Owners and First Nations

**State water laws continue to marginalise Aboriginal and Torres Strait Islander rights and interests in water, preventing them from giving effect to their own obligations to care for Country, and preventing their development of cultural economies.**

Australia has almost entirely failed to come to terms with the legacy of *aqua nullius* (the erroneous assumption that water belonged to no one when the British invaded), which continues to create both legitimacy and sustainability problems for water management,<sup>53</sup> as well as undermining the inherent and unceded rights of Indigenous Peoples.<sup>54</sup> In 2004, the NWI entrenched and exacerbated existing water injustice and dispossession through its separation of land and water, and the problem has only worsened in the intervening 22 years, with less than 0.2% of water rights in the MDB being held by Indigenous organisations.<sup>55</sup> This trend is reflected (or worsened) in other jurisdictions outside the MDB.<sup>56</sup>

<sup>51</sup> Ibid 9.

<sup>52</sup> Ibid 11.

<sup>53</sup> E O'Donnell, 'Water Sovereignty for Indigenous Peoples: Pathways to Pluralist, Legitimate and Sustainable Water Laws in Settler Colonial States' (2023) 2(11) *PLOS Water* e0000144.

<sup>54</sup> Virginia Marshall, *Overturning Aqua Nullius: Securing Aboriginal Water Rights* (Aboriginal Studies Press, 2017).

<sup>55</sup> L Hartwig and S Jackson, *The Status of Aboriginal Water Holdings in the Murray-Darling Basin: ARI Report No. 2020/004* (Australian Rivers Institute, Griffith University, 2020) <<http://hdl.handle.net/10072/400302>>; Lana Hartwig, S Jackson and N Osborne, 'Trends in Aboriginal Water Ownership in New South Wales, Australia: The Continuities between Colonial and Neoliberal Forms of Dispossession' (2020) 99 *Land Use Policy* 104869; Lana Hartwig et al, 'Water Colonialism and Indigenous Water Justice in South-Eastern Australia' (2021) 38(1) *International Journal of Water Resources Development* 30.

<sup>56</sup> Erin O'Donnell, Sue Jackson and Lana Hartwig, *Independent Peer Review of PIC Aboriginal Water Holdings Baseline Report* (unpublished, University of Melbourne, 2023).

Moreover, this situation of historical dispossession and limited present day water interests for Aboriginal Peoples and Torres Strait Islanders is further exacerbated by the inequitable position of Indigenous water interests under the *Native Title Act 1993*. There is a savings provision operating between the *Native Title Act 1993* and the *Commonwealth Water Act 2007*.<sup>57</sup> Thus each statutory regime is held at law to operate independently. Even so, the reality is far different as a wide variety of water infrastructure and public works that are water-related are deemed to extinguish native title rights and interests.<sup>58</sup> In turn, following the High Court *Ward* decision in 2002,<sup>59</sup> native title claimants can only establish non-exclusive rights to waters with consequent tensions in implementation of such rights where there are competing uses.<sup>60</sup> Further, despite the High Court decision in *Akiba* that recognised a broadly framed native title ‘resource right for any purpose’,<sup>61</sup> Indigenous claims for participation in water markets and commercial water ventures have been highly constrained through the *Native Title Act* model. Indigenous peoples’ efforts to protect water as a vital component of connection to country under the Future Acts regime<sup>62</sup> in the face of extensive project development, including mining and energy extraction on country,<sup>63</sup> is another area of concern where robust policy and legal reforms are needed to redress significant structural inequities in water access, allocation and longer term governance.<sup>64</sup> The failure of the water statutes across Australia to offer any substantial measure of relief and redress for Aboriginal and Torres Strait Islander communities, despite NWI commitments, highlights the continual prioritisation of colonially-derived water assets and economic productivity over equity principles at many levels of government. A more holistic accounting for how water and productivity are linked through Indigenous dispossession is required in policy settings.

The failure to offer substantive measures to redress Indigenous water dispossession has been repeatedly documented by successive government reviews, including by the Productivity Commission, although little has changed in state or national policy settings. We note the recent Aboriginal Water Entitlements Program has finally begun purchasing water entitlements for Indigenous organisations in the MDB, but even the full expenditure of its \$100M budget only equates to 0.3% of the total value of water entitlements on issue in the southern MDB. Whilst an important first step, this will not achieve water justice for First Nations.

Outside the MDB, water programs in other jurisdictions are failing to deliver for First Nations. Across the north of Australia, there has been commitment to create Aboriginal Water

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<sup>57</sup> *Water Act 2007* (Cth), s 13, ‘Nothing in this Act affects the operation of the Native Title Act 1993’.

<sup>58</sup> See for example Division 2 B and Schedule 1 *Native Title Act 1993* (Cth).

<sup>59</sup> *Western Australia v Ward* (2002) 213 CLR 1.

<sup>60</sup> See also, Katie O’Byrne, ‘More Aqua Nullius? The Traditional Owner Settlement Act 2010 (Vic) and the Neglect of Indigenous Rights to Manage Land and Water Resources’ (2016) 40 *Melbourne University Law Review* 547.

<sup>61</sup> *Akiba on behalf of the Torres Strait Regional Seas Claim Group v Commonwealth of Australia* [2013] CLR 209, [21 -25].

<sup>62</sup> The Future Acts regime was the subject review, see, ALRC Review of the Future Acts Regime: <<https://www.alrc.gov.au/inquiry/review-of-the-future-acts-regime/>>. As noted on the ALRC website, among the issues considered in the review is ‘the importance of the future acts regime being appropriately designed for Australia’s current and future social and economic development, in a way that respects the rights and interests of native title holders.’

<sup>63</sup> Lee Godden, ‘Frontier Extractivism: Climate Change and Indigenous Dispossession’ (2025) 28(1), Special Issue, *Extractivism Law Text Culture* 40–74, <<https://doi.org/10.14453/lrc.1715>>.

<sup>64</sup> The very ‘mixed’ outcomes of the native title claims process is noted in *Widjambul Wia-bal v Attorney General of New South Wales* [2022] FCA 1187 at [72]-[73].

Reserves.<sup>65</sup> In the Northern Territory, although sometimes substantial volumes of water have been set aside for Aboriginal use, this is contingent on massive increases in what is deemed sustainable water allocation limits and none of this water has made it into Aboriginal control.<sup>66</sup> In Western Australia, Aboriginal Water Reserves have been created as part of native title settlement agreements (such as the Yamatji agreement) and within non-statutory, non-binding water plans, which renders these commitments little more than guidelines.<sup>67</sup> In Queensland, Aboriginal Water Reserves remain small and hard to access, undermined by lack of support for implementation.<sup>68</sup>

In NSW, there are now dedicated cultural water entitlements that Indigenous organisations can apply to access, but these are limited to non-commercial uses and of small volumes. This increases the workload in applying for the water, requires codification and justification of cultural uses to non-Indigenous organisations, and prevents any economic development relating to water use, which perpetuates water injustice. Such constraints undermine the water returned to the point where it cannot meet the requirements of cultural flows.<sup>69</sup>

In Victoria, there have been substantial recent efforts to return water to Traditional Owners. However, for the most part, this water has been returned from water that considered to be ‘unallocated’ (i.e. not currently used for other purposes) and is almost entirely in southern Victoria. Further, despite each of these returns involving the issue of water rights for instream cultural uses, Traditional Owner organisations were required to negotiate intensively with government for over a year, for example:

- In March 2021, Gunaikurnai Land and Waters Aboriginal Corporation received a 2 GL water licence in the Mitchell River. This process formally began at a workshop held as part of the *Cultural Water for Cultural Economies* project in February 2020.<sup>70</sup>
- In September 2022, Gunditj Mirring Traditional Owner Aboriginal Corporation received a 2.5 GL water licence in the Fitzroy River catchment in south-western Victoria.<sup>71</sup> This process was also initiated at a separate workshop as part of the *Cultural Water for Cultural Economies* project in February 2020.

<sup>65</sup> Lee Godden, Sue Jackson and Katie O’Byrne, ‘Indigenous Water Rights and Water Law Reforms in Australia’ (2020) 37 *Environmental and Planning Law Journal* 655; Katherine Selena Taylor et al, *Indigenous Water Reserves in Australia: 2022 Policy Brief* (Application/pdf, The Australian National University, 2022) 50 pages <<https://openresearch-repository.anu.edu.au/handle/1885/280411>> (*Indigenous Water Reserves in Australia*).

<sup>66</sup> Sue Jackson, Erin O’Donnell and Matthew Currell, ‘River Grabbing from the Source: Groundwater Extraction and the Self-Perpetuating Colonial Practices of Dispossession in Australia’s Northern Territory’ (2026) 124(103435) *Political Geography* 1 (‘River Grabbing from the Source’); E O’Donnell et al, ‘Racialised Water Governance and the “Hydrological Frontier”, Northern Territory, Australia’ (2022) 26(1) *Australasian Journal of Water Resources* 59.

<sup>67</sup> Taylor et al, above n 55.

<sup>68</sup> Godden et al, above n 55.

<sup>69</sup> Erin O’Donnell et al, ‘Cultural Water and Indigenous Water Science’ (2023) 381(6658) *Science* 619; MLDRIN, *Echuca Declaration* (Murray Lower Darling Rivers Indigenous Nations, 2007) <<https://www.mldr.in.org.au/wp-content/uploads/2018/07/Echuca-Declaration-Final-PDF.pdf>>.

<sup>70</sup> Troy McDonald and Erin O’Donnell, ‘Victoria Just Gave 2 Billion Litres of Water Back to Indigenous People. Here’s What That Means for the Rest of Australia’, *The Conversation* (<https://theconversation.com/victoria-just-gave-2-billion-litres-of-water-back-to-indigenous-people-heres-what-that-means-for-the-rest-of-australia-150674>, online, 30 November 2020) <<https://theconversation.com/victoria-just-gave-2-billion-litres-of-water-back-to-indigenous-people-heres-what-that-means-for-the-rest-of-australia-150674>>.

<sup>71</sup> Kyra Gillespie, ‘Gunditjmarra Traditional Owners Handed Unallocated Water from Fitzroy River System’, *ABC News Online* (online, 2022) <<https://www.abc.net.au/news/2022-10-09/gunditjmarra-given-unallocated-water-from-fitzroy-river-system/101506836>>.

- In October 2023, Gunaikurnai Land and Waters Aboriginal Corporation received two further licences (500 ML surface water licence in the Tambo River, and 200 ML groundwater licence in the Buchan Munji aquifer system). Negotiations for these licences commenced shortly after *Water is Life* was launched in September 2022.<sup>72</sup>
- In October 2024, Wurundjeri Woi-Wurrung Cultural Heritage Aboriginal Corporation received a 1.4 GL water licence on the Birrarung/Yarra River,<sup>73</sup> after initially requesting this water be returned to them in 2020.

In 2021, 1.36 GL of water was set aside in Victoria for return to Traditional Owners and First Nations in the Goulburn and Murray storage systems, as a result of additional water savings recovered by the Victorian Government as part of irrigation infrastructure upgrades. Five years later, in 2026, this water has not been returned to Indigenous organisations, and there are no public timelines on when or how this return will occur.

### **In practice, state water laws do not enable meaningful Aboriginal and Torres Strait Islander influence over groundwater management across environmental, cultural and economic objectives**

A 2020 study determined that in the Murray-Darling Basin, Aboriginal organisations held between 0.022% and 0.03% of all groundwater entitlements in the Basin, with those entitlements only being held in New South Wales and Victoria (i.e., no Aboriginal-held entitlements were found in Queensland, the Australian Capital Territory, or South Australia).<sup>74</sup> Traditional Owners currently own only about 0.07% of groundwater entitlements in Victoria, as compared with 0.17% of all water entitlements.<sup>75</sup> The practical benefits of the Northern Territory's Aboriginal water reserves are fundamentally constrained in failing to correct overallocation of groundwater, and do not apply to pre-2019 water allocation plans and areas that do not have a water allocation plan, while imposing governance boundaries that overlook Indigenous knowledges and cultural obligations.<sup>76</sup>

### **Implementation problems are widely recognised, but correcting them needs more sustained law and policy focus and support**

Jurisdictions are, in an ad hoc way, beginning to improve their engagement with Aboriginal and Torres Strait Islander values and uses in relation to surface water and groundwater. In Victoria, changes to the *Water Act 1989* in 2019 introduced new purposes and specific requirements in various sections to incorporate Aboriginal cultural values and uses of waterways. In 2022, Victoria released *Water is Life*, their policy on increasing Aboriginal water rights and influence in

<sup>72</sup> William Howard, 'Water Rights Returned to Gippsland Traditional Owners in Landmark Victorian Government Deal', *ABC News Online* (online, 2023) <<https://www.abc.net.au/news/2023-10-12/traditional-owners-given-more-water-in-landmark-announcement/102963860>>.

<sup>73</sup> 'Returning Water In The Birrarung To Traditional Owners' <<https://www.premier.vic.gov.au/returning-water-birrarung-traditional-owners>>.

<sup>74</sup> Lana Hartwig and Sue Jackson, 'The status of Aboriginal water holdings in the Murray-Darling Basin' (Report prepared for the Murray-Darling Basin Authority, 2020) 47 <<http://hdl.handle.net/10072/400302>>.

<sup>75</sup> Department of Environment Land Water and Planning (State of Victoria), 'Water is Life: Traditional Owner Access to Water Roadmap' (Policy, 2022) Table 2 <<https://www.water.vic.gov.au/our-programs/aboriginal-water-program/water-is-life-roadmap>>.

<sup>76</sup> See generally Sue Jackson et al, 'Ontological Collisions in the Northern Territory's Aboriginal Water Rights Policy' (2023) 93(3) *Oceania* 259-281, 272, 275-277 (illustrated by reference to the Ooloo Dolostone Aquifer).

water management.<sup>77</sup> However, since then, implementation has effectively ground to a halt. Despite committing to legislate to recognise all waterways as living entities<sup>78</sup> by 2025 (Outcome 1 of *Water is Life*), the Victorian Government has brought no such legislation before Parliament and is now unlikely to do so before the next election in November 2026. Almost no progress has been made against the other eleven outcomes.

In preparing the New South Wales Groundwater Strategy, the New South Wales government supported a 2023 study to document Aboriginal groundwater use and management practices, cultural values, and how New South Wales law and policy could better support them.<sup>79</sup> The 2024 Implementation Plan for the Great Artesian Basin Strategic Management Plan anticipated a survey of First Nations cultural water use.<sup>80</sup> But these efforts are ad hoc and, across Australia, insufficient.

First Nations' frustrations about this inadequacy in relation to groundwater are reflected in significant high-profile litigation. The Mpwerrmpwer Aboriginal Corporation (Northern Territory) is currently appealing—in the High Court of Australia—the grant of a groundwater licence to a developer that proposes to develop an intensive irrigated horticulture operation over 3,500 hectares using 40 GL of groundwater per year; the challenge argues, among other things, that the Minister did not adequately take into account Aboriginal cultural values in applying conditions to the licence.<sup>81</sup> In 2025, the Federal Court of Australia heard a case brought by a peak body for Indigenous peoples, the Murray-Lower Darling Rivers Indigenous Nations (MLDRIN), which challenged the accreditation of a proposed water resources plan for groundwater in New South Wales.<sup>82</sup> These disputes further underline the importance of supporting more effective recognition of First Nations' objectives in groundwater management and water management more generally.

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<sup>77</sup> Department of Environment, Land, Water and Planning, *Water Is Life: Traditional Owner Access to Water Roadmap* (State Government of Victoria, 2022) <<https://www.water.vic.gov.au/our-programs/aboriginal-water-program/water-is-life-roadmap>>.

<sup>78</sup> This is a foundational recognition of Indigenous Peoples' connections with and obligations to waterways, who are often considered as living ancestral beings and kin, see Martuwarra RiverOfLife et al, 'Yoongoorrookoo: The Emergence of Ancestral Personhood' (2021) 30(3) *Griffith Law Review* 505; Erin O'Donnell, 'Repairing Our Relationship with Rivers: Water Law and Legal Personhood' in Rhett Larson and Vanessa Casado Pérez (eds), *Research Agenda for Water Law* (Edward Elgar, 2023) 113.

<sup>79</sup> Bradley Moggridge, 'Aboriginal cultural values, social economic connections, and opportunities in relation to groundwater in NSW' (Report, Department of Planning and Environment (New South Wales), 2023) <[https://publications.water.nsw.gov.au/watergroupjpsui/bitstream/100/650/1/Aboriginal\\_cultural\\_values\\_social\\_economic\\_connections\\_and\\_opportunities\\_in\\_relation\\_to\\_groundwater\\_in\\_NSW.pdf](https://publications.water.nsw.gov.au/watergroupjpsui/bitstream/100/650/1/Aboriginal_cultural_values_social_economic_connections_and_opportunities_in_relation_to_groundwater_in_NSW.pdf)>.

<sup>80</sup> Department of Climate Change Energy the Environment and Water (Commonwealth), 'Great Artesian Basin Strategic Management Plan – 5-year Implementation Plan' (Plan, 2024) 13 <<https://www.dcceew.gov.au/sites/default/files/documents/gab-strategic-management-plan-implementation-plan-2024.pdf>>.

<sup>81</sup> The appellant's submissions in the current High Court proceedings are available at <[https://www.hcourt.gov.au/sites/default/files/2025-10/Mpwerrmpwer-Min\\_App.pdf](https://www.hcourt.gov.au/sites/default/files/2025-10/Mpwerrmpwer-Min_App.pdf)>. Further case information is available at <<https://www.hcourt.gov.au/cases-and-judgments/cases/current/case-no-d142025>>.

<sup>82</sup> See generally *Murray Lower Darling Rivers Indigenous Nations v Commonwealth* (2025) 312 FCR 243 ('MLDRIN v Cth').

## Recommendation 5: Better integrate management of water, land and other parts of the environment, reflecting First Nations perspectives and regulatory best practice in managing cumulative impacts on water systems

As well as relating to the NWI terms of reference for this inquiry, this recommendation is relevant to the proposed new National Water Agreement (Outcome 6A, cl 6.3.4 ‘early consideration of opportunities to integrate complementary, non-volumetric natural resource management measures and partnerships to achieve defined environmental outcomes’; Outcome 6C ‘The interconnected nature of actions on land and water is recognised and managed’).

Integrated consideration of water and other elements of the natural environment was a strong historical policy focus in Australian water management, for example, in the guise of integrated catchment management. Recognition of the importance of this integration has since arguably faded, but we are now entering an era in which the importance of connecting across water and other resources is again increasing significantly.

The issue of integrating the management of water and other resources is relevant throughout Australia. For example, in the context of the MDB, this relevance is evident in the Basin Plan Review discussion paper’s recognition that ‘[i]n many cases, implementation of the Basin Plan alone is insufficient’,<sup>83</sup> that is, attention to a wider range of issues is necessary to achieve environmental objectives in water systems. In that context, there is attention to addressing floodplain and wetland disconnection, protecting base flows, addressing barriers to native fish recovery, and restoring habitats. This points to the larger issue of integrating laws and policies that deal with different parts of the environment to address *cumulative impacts* to water systems. How to do this integration is a difficult policy question for Australian jurisdictions, which warrants sustained attention and development of guidance in coordinated national water policy.

New research on regulatory design offers a ‘CIRcLe’ framework of four integrated functions (Conceptualisation, Information, Regulatory intervention and Coordination)<sup>84</sup> for structuring the policy questions that need answers in this context, focusing on coordinated effort—across law and policy regimes—to:

- conceptualise ‘what matters’ for protection, and what acceptable limits of change or restoration targets look like (‘Conceptualisation’);
- co-produce, aggregate and govern information that combines scientific monitoring and local and Indigenous ecological knowledge, with relevant protocols, transparent indicators and explicit treatment of uncertainty to support decisions (‘Information’);
- design a coherent mix of regulatory interventions, across a typology of regulatory approaches (regulatory ‘sticks’, ‘carrots’, ‘sermons’ and ‘state rescue’), and strategies (to

<sup>83</sup> Murray-Darling Basin Authority, *2026 Murray-Darling Basin Plan Review: Discussion Paper* (Murray-Darling Basin Authority, 2026) 15 <<https://www.mdba.gov.au/sites/default/files/publications/2026-murray-darling-basin-plan-review-discussion-paper.pdf>>.

<sup>84</sup> For a full description of this approach and sample application to case studies, see Rebecca Nelson, *Regulating a Thousand Cuts: Global Law and Policy Solutions to Cumulative Environmental Problems* (Cambridge University Press 2025), <https://doi.org/10.1017/9781009091930>. For a brief summary of the approach, see Rebecca Nelson, ‘Regulating a Thousand Cuts for Researchers, Regulators and Policy Makers’ (Policy Brief, October 2025), <https://doi.org/10.26188/31847167>.

reduce, offset, restore, and cope with adverse impacts), including environmental groundwater entitlements, adaptive permit conditions, restoration mandates and incentives for beneficial practice ('Regulatory intervention'); and

- create durable coordination mechanisms – which might be based on rules, rather than new institutions—to better integrate the conceptualisation, information and intervention functions in water, land-use, biodiversity and environment protection laws ('Coordination').

Integration as an aim for water management is both consistent with Indigenous worldviews that do not see water as disconnected from other aspects of the environment (see Recommendation 4 above). Integration is also expressly reflected in Outcome 6C of the new National Water Agreement, as presently drafted ('The interconnected nature of actions on land and water is recognised and managed'). Achieving this outcome will require guidance.

## References

### A Articles, Books and Reports

Adhikari, RK, AG Yilmaz, B Mainali, P Dyson and MA Imteaz, 'Methods of Groundwater Recharge Estimation under Climate Change: A Review' (2022) 14(23) *Sustainability* 15619  
<https://doi.org/10.3390/su142315619>

Australian Climate Service, *National Climate Risk Assessment* (Commonwealth of Australia, 2025)  
<https://climateservice.maps.arcgis.com/sharing/rest/content/items/9d4850b2d64d47e28407c04681b0eeca/data>

Australian and State and Territory Governments, *Module to the National Water Initiative (NWI) Policy Guidelines for Water Planning and Management: Considering Climate Change and Extreme Events in Water Planning and Management* (Australian Government, 2017)  
<https://www.dcceew.gov.au/sites/default/files/sitecollectiondocuments/water/climate-change.pdf>

Australian and State and Territory Governments, *National Groundwater Strategic Framework 2016–2026* (Australian Government, 2016) <https://www.dcceew.gov.au/water/policy/policy/nwi/national-groundwater>

Australian Law Reform Commission, *Review of the Future Acts Regime* (Web Page)  
<https://www.alrc.gov.au/inquiry/review-of-the-future-acts-regime/>

Bartlett, Richard, *Native Title in Australia* (3rd ed, LexisNexis Butterworths, 2015)

Benz, SA, DJ Irvine, GC Rau, P Bayer, K Menberg, P Blum, RC Jamieson, C Griebler and BL Kurylyk, 'Global Groundwater Warming due to Climate Change' (2024) 17(6) *Nature Geoscience* 545  
<https://doi.org/10.1038/s41561-024-01453-x>

Caretta, MA, A Mukherji, M Arfanuzzaman, RA Betts, A Gelfan, Y Hirabayashi, TK Lissner, J Liu, E Lopez Gunn, R Morgan, S Mwanga and S Supratid, 'Water' in H-O Pörtner, DC Roberts, M Tignor, ES Poloczanska, K Mintenbeck, A Alegría, M Craig, S Langsdorf, S Löschke, V Möller, A Okem and B Rama (eds), *Climate Change 2022: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2022) 551 <https://doi:10.1017/9781009325844.006>

Cook, Peter G et al, 'Sustainable Management of Groundwater Extraction: An Australian Perspective on Current Challenges' (2022) 44 *Journal of Hydrology: Regional Studies* article 101262  
<https://doi.org/10.1016/j.ejrh.2022.101262>

Costa, D, H Zhang and J Levison, 'Impacts of Climate Change on Groundwater in the Great Lakes Basin: A Review' (2021) 47(6) *Journal of Great Lakes Research* 1613 <https://doi.org/10.1016/j.jglr.2021.10.011>

Council of Australian Governments, *National Groundwater Strategic Framework 2016–2026* (Australian Government, 2017) <https://www.dcceew.gov.au/water/policy/policy/nwi/national-groundwater>

Davamani, V, JE John, C Poornachandhra, B Gopalakrishnan, S Arulmani, E Parameswari, A Santhosh, A Srinivasulu, A Lal and R Naidu, 'A Critical Review of Climate Change Impacts on Groundwater Resources:

A Focus on the Current Status, Future Possibilities, and Role of Simulation Models' (2024) 15(1) *Atmosphere* 122 <https://doi.org/10.3390/atmos15010122>

Department of Climate Change Energy the Environment and Water (Cth), *Great Artesian Basin Strategic Management Plan – 5-Year Implementation Plan* (Department of Climate Change Energy the Environment and Water, 2024) <https://www.dcceew.gov.au/sites/default/files/documents/gab-strategic-management-plan-implementation-plan-2024.pdf>

Department of Environment, Land, Water and Planning (Vic), *Groundwater Management 2030* (DELWP, 2020) <https://www.water.vic.gov.au/water-sources/groundwater/groundwater-management-2030>

Department of Environment, Land, Water and Planning (Vic), *Water Cycle Climate Change Adaptation Action Plan 2022–2026* (Victorian Government, 2021) <https://www.climatechange.vic.gov.au/building-victorias-climate-resilience/our-commitment-to-adapt-to-climate-change/water-cycle-adaptation-action-plan>

Department of Environment, Land, Water and Planning (Vic), *Water is Life: Traditional Owner Access to Water Roadmap* (DELWP, 2022) <https://www.water.vic.gov.au/our-programs/aboriginal-water-program/water-is-life-roadmap>

Department of Primary Industries, Parks, Water and Environment (Tas), *Rural Water Use Strategy* (DIPWE, 2021) <https://nre.tas.gov.au/Documents/Rural%20Water%20Use%20Strategy.pdf>

Gillespie, Kyra, 'Gunditjmarra Traditional Owners Handed Unallocated Water from Fitzroy River System', *ABC News* (online, 9 October 2022) <https://www.abc.net.au/news/2022-10-09/gunditjmarra-given-unallocated-water-from-fitzroy-river-system/101506836>

Lee Godden, 'Frontier Extractivism: Climate Change and Indigenous Dispossession' (2025) 28(1), Special Issue, *Extractivism Law Text Culture* 40–74 <https://doi.org/10.14453/ltc.1715>

Green, TR, M Taniguchi, H Kooi, JJ Gurdak, DM Allen, KM Hiscock, H Treidel and A Aureli, 'Beneath the Surface of Global Change: Impacts of Climate Change on Groundwater' (2011) 405 *Journal of Hydrology* 532 <https://doi.org/10.1016/j.jhydrol.2011.05.002>

Godden, Lee, 'Frontier Extractivism: Climate Change and Indigenous Dispossession' (2025) 28(1) *Law Text Culture* 40.

Godden, Lee, Sue Jackson and Katie O'Bryan, 'Indigenous Water Rights and Water Law Reforms in Australia' (2020) 37 *Environmental and Planning Law Journal* 655

Hartwig, L and S Jackson, *The Status of Aboriginal Water Holdings in the Murray-Darling Basin: ARI Report No 2020/004* (Australian Rivers Institute, Griffith University, 2020) <http://hdl.handle.net/10072/400302>

Hartwig, Lana, S Jackson and N Osborne, 'Trends in Aboriginal Water Ownership in New South Wales, Australia: The Continuities between Colonial and Neoliberal Forms of Dispossession' (2020) 99 *Land Use Policy* 104869 <https://doi.org/10.1016/j.landusepol.2020.104869>

Hartwig, Lana, S Jackson, F Markham and N Osborne, 'Water Colonialism and Indigenous Water Justice in South-Eastern Australia' (2021) 38(1) *International Journal of Water Resources Development* 30 <https://doi.org/10.1080/07900627.2020.1868980>

Howard, William, 'Water Rights Returned to Gippsland Traditional Owners in Landmark Victorian Government Deal', *ABC News* (online, 12 October 2023) <https://www.abc.net.au/news/2023-10-12/traditional-owners-given-more-water-in-landmark-announcement/102963860>

Jackson, Sue, Erin O'Donnell and Matthew Currell, 'River Grabbing from the Source: Groundwater Extraction and the Self-Perpetuating Colonial Practices of Dispossession in Australia's Northern Territory' (2026) 124(103435) *Political Geography* 1

Jackson, Sue et al, 'Ontological Collisions in the Northern Territory's Aboriginal Water Rights Policy' (2023) 93(3) *Oceania* 259–281 <https://doi.org/10.1002/occea.5388>

Kuang, X, J Liu, BR Scanlon, JJ Jiao, S Jasechko, M Lancia, BK Biskaborn, Y Wada, H Li, Z Zeng, Z Guo, Y Yao, T Gleeson, JP Nicot, X Luo, Y Zou and C Zheng, 'The Changing Nature of Groundwater in the Global Water Cycle' (2024) 383(6686) *Science* eadf0630 <https://doi.org/10.1126/science.adf0630>

Maliva, RG, *Climate Change and Groundwater: Planning and Adaptations for a Changing and Uncertain Future* (Springer, 2021) <https://doi.org/10.1007/978-3-030-66813-6>

Marshall, Virginia, *Overturing Aqua Nullius: Securing Aboriginal Water Rights* (Aboriginal Studies Press, 2017) <https://aiatsis.gov.au/publication/35022>

Martuwarra RiverOfLife et al, 'Yoongoorrookoo: The Emergence of Ancestral Personhood' (2021) 30(3) *Griffith Law Review* 505

McClelland, Roanna, Jacqueline Peel, Rebecca Nelson and Margaret Young, 'What are the Implications of the ICJ Climate Advisory Opinion for EIA in Australia?' (Policy Brief, Melbourne Law School, 15 September 2025) <https://law.unimelb.edu.au/centres/mcle/research/policy-briefs>

McDonald, Troy and Erin O'Donnell, 'Victoria Just Gave 2 Billion Litres of Water Back to Indigenous People. Here's What That Means for the Rest of Australia', *The Conversation* (online, 30 November 2020) <https://theconversation.com/victoria-just-gave-2-billion-litres-of-water-back-to-indigenous-people-heres-what-that-means-for-the-rest-of-australia-150674>

MLDRIN, *Echuca Declaration* (Murray Lower Darling Rivers Indigenous Nations, 2007) <https://www.mldrin.org.au/wp-content/uploads/2018/07/Echuca-Declaration-Final-PDF.pdf>

Moggridge, Bradley, *Aboriginal Cultural Values, Social Economic Connections, and Opportunities in Relation to Groundwater in NSW* (Department of Planning and Environment (New South Wales), 2023) [https://publications.water.nsw.gov.au/watergroupjspui/bitstream/100/650/1/Aboriginal\\_cultural\\_values\\_social\\_economic\\_connections\\_and\\_opportunities\\_in\\_relation\\_to\\_groundwater\\_in\\_NSW.pdf](https://publications.water.nsw.gov.au/watergroupjspui/bitstream/100/650/1/Aboriginal_cultural_values_social_economic_connections_and_opportunities_in_relation_to_groundwater_in_NSW.pdf)

Murray-Darling Basin Authority, *2026 Murray-Darling Basin Plan Review: Discussion Paper* (Murray-Darling Basin Authority, 2026) <https://www.mdba.gov.au/sites/default/files/publications/2026-murray-darling-basin-plan-review-discussion-paper.pdf>

Nelson, Rebecca, *Regulating a Thousand Cuts: Global Law and Policy Solutions to Cumulative Environmental Problems* (Cambridge University Press 2025), <https://doi.org/10.1017/9781009091930>

Nelson, Rebecca, 'Regulating a Thousand Cuts for Researchers, Regulators and Policy Makers' (Policy Brief, Melbourne Centre for Law and the Environment, October 2025), <https://doi.org/10.26188/31847167>

Nelson, Rebecca L and Debra Perrone, 'Environmental Groundwater Rights in the Western United States and Australia' (2025) 28 *Journal of Water Law* 190-194

Nelson, Rebecca et al, *Water, Law and Concepts of Equity* (Water Trust Australia, 2024)  
<https://watertrustaustralia.org.au/sites/default/files/2024-12/WaterLawConceptsOfEquity20231031.pdf>

Nelson, Rebecca, 'Water Rights for Groundwater Environments as an Enabling Condition for Adaptive Water Governance' (2022) 27(2) *Ecology & Society* article 28 <https://doi.org/10.5751/ES-13123-270228>

New South Wales Department of Planning and Environment, *NSW Groundwater Strategy* (NSW Government, December 2022) <https://www.water.dcceew.nsw.gov.au/our-work/plans-and-strategies/nsw-groundwater-strategy>

New South Wales Government, *NSW Climate Change Adaptation Action Plan 2025–2029* (NSW Department of Planning, Housing and Infrastructure, 2025)  
<https://www.climatechange.environment.nsw.gov.au/about-adaptnsw/nsw-government-action-climate-change/Adaptation-Action-Plan-2025-2029>

Queensland Department of Regional Development, Manufacturing and Water and Department of Environment and Science, *Queensland Water Planning Science Plan 2020–2030* (State of Queensland, 2020) 39 <https://wetlandinfo.detsi.qld.gov.au/resources/static/pdf/assessment-toolbox/water-planning-science-plan-2020-2030.pdf>.

*Obligations of States in Respect of Climate Change* (Advisory Opinion, International Court of Justice, 2025) <Advisory Opinion of 23 July 2025 >

O'Bryan, Katie, 'More Aqua Nullius? The Traditional Owner Settlement Act 2010 (Vic) and the Neglect of Indigenous Rights to Manage Land and Water Resources' (2016) 40 *Melbourne University Law Review* 547

O'Donnell, Erin, 'Repairing Our Relationship with Rivers: Water Law and Legal Personhood' in Rhett Larson and Vanessa Casado Pérez (eds), *Research Agenda for Water Law* (Edward Elgar, 2023) 113

O'Donnell, Erin et al, 'Racialised Water Governance and the "Hydrological Frontier", Northern Territory, Australia' (2022) 26(1) *Australasian Journal of Water Resources* 59

O'Donnell, Erin, Sue Jackson and Lana Hartwig, *Independent Peer Review of PIC Aboriginal Water Holdings Baseline Report* (Unpublished, University of Melbourne, 2023)

O'Donnell, E, 'Water Sovereignty for Indigenous Peoples: Pathways to Pluralist, Legitimate and Sustainable Water Laws in Settler Colonial States' (2023) 2(11) *PLOS Water* e0000144  
<https://doi.org/10.1371/journal.pwat.0000144>

O'Donnell, Erin, M Kennedy, D Garrick, A Horne and R Woods, 'Cultural Water and Indigenous Water Science' (2023) 381(6658) *Science* 619 <https://doi.org/10.1126/science.adi0658>

O'Donnell, Erin, Sue Jackson and Lana Hartwig, *Independent Peer Review of PIC Aboriginal Water Holdings Baseline Report* (unpublished, University of Melbourne, 2023)

Productivity Commission, *National Water Reform*, Inquiry Report No 87 (Productivity Commission, 19 December 2017) [https://assets.pc.gov.au/\\_data/assets/pdf\\_file/0007/228175/water-reform.pdf](https://assets.pc.gov.au/_data/assets/pdf_file/0007/228175/water-reform.pdf)

Productivity Commission, *National Water Reform 2020*, Inquiry Report No 96 (Productivity Commission, 28 May 2021) <https://assets.pc.gov.au/inquiries/completed/water-reform-2020/report/water-reform-2020.pdf>

Productivity Commission, *National Water Reform 2024*, Inquiry Report No 105 (Productivity Commission, 28 May 2024) [https://assets.pc.gov.au/2025-10/Water%20reform%20report.pdf?VersionId=ZzDTW0bcW2utNb\\_o2h\\_pAqD0fMclh.H0](https://assets.pc.gov.au/2025-10/Water%20reform%20report.pdf?VersionId=ZzDTW0bcW2utNb_o2h_pAqD0fMclh.H0)

Queensland Department of Natural Resources, Mines and Energy, *2020–2030 Water Planning Science Plan* (Queensland Government, 2019) <https://wetlandinfo.detsi.qld.gov.au/resources/static/pdf/assessment-toolbox/water-planning-science-plan-2020-2030.pdf>

Queensland Government, *Queensland Water Strategy* (Queensland Department of Regional Development, Manufacturing and Water, 2021) [https://www.rdmw.qld.gov.au/\\_data/assets/pdf\\_file/0009/1776276/qld-water-strategy-full.pdf](https://www.rdmw.qld.gov.au/_data/assets/pdf_file/0009/1776276/qld-water-strategy-full.pdf)

'Returning Water in the Birrarung to Traditional Owners' (Media Release, Premier of Victoria, (18 October 2024) <https://www.premier.vic.gov.au/returning-water-birrarung-traditional-owners>

Richardson, CM, KL Davis, C Ruiz-González, JA Guimond, HA Michael, A Paldor, N Moosdorf and A Paytan, 'The Impacts of Climate Change on Coastal Groundwater' (2024) 5 *Nature Reviews Earth & Environment* 100 <https://doi.org/10.1038/s43017-023-00500-2>

Taylor, Katherine Selena et al, *Indigenous Water Reserves in Australia: 2022 Policy Brief* (The Australian National University, 2022) <https://openresearch-repository.anu.edu.au/handle/1885/280411>

Taylor, RG, B Scanlon, P Döll, M Rodell, R van Beek, Y Wada, L Longuevergne, M Leblanc, JS Famiglietti, M Edmunds, L Konikow, TR Green, J Chen, M Taniguchi, MFP Bierkens, A MacDonald, Y Fan, RM Maxwell, Y Yechieli, JJ Gurdak, DM Allen, M Shamsudduha, K Hiscock, PJF Yeh, I Holman and H Treidel, 'Ground Water and Climate Change' (2013) 3 *Nature Climate Change* 322 <https://doi.org/10.1038/nclimate1744>

UN-Water Expert Group on Water and Climate Change, *Study on Water Requirements of Climate Mitigation Measures: Terms of Reference* (UN-Water, 8 November 2023). [https://www.unwater.org/sites/default/files/2023-11/UN-Water\\_ClimateWaterDependenciesStudy\\_TORs.pdf](https://www.unwater.org/sites/default/files/2023-11/UN-Water_ClimateWaterDependenciesStudy_TORs.pdf)

Victorian Department of Environment, Land, Water and Planning, *Water Cycle Adaptation Action Plan 2022–2026* (2022) [https://www.climatechange.vic.gov.au/\\_data/assets/pdf\\_file/0025/558421/DELWP0220-water-system-climate-changea-adaptation-plan.pdf](https://www.climatechange.vic.gov.au/_data/assets/pdf_file/0025/558421/DELWP0220-water-system-climate-changea-adaptation-plan.pdf)

Victorian Government, *Water for Victoria* (Victorian Government, 2016) <https://www.water.vic.gov.au/about-us/water-for-victoria>

Western Australian Department of Water and Environmental Regulation, *Climate Adaptation Strategy: Building WA's Climate Resilient Future* (Government of Western Australia, 2023) [https://www.wa.gov.au/system/files/2023-07/climate\\_adaption\\_strategy\\_220623.pdf](https://www.wa.gov.au/system/files/2023-07/climate_adaption_strategy_220623.pdf)

## **B Cases**

*Murray Lower Darling Rivers Indigenous Nations v Commonwealth* (2025) 312 FCR 243

*Akiba on behalf of the Torres Strait Regional Seas Claim Group v Commonwealth of Australia* (2013) 250 CLR 209.

*Western Australia v Ward* (2002) 213 CLR 1.

*Widjabul Wia-bal v Attorney General of New South Wales* [2022] FCA 1187.

## **C Legislation**

*Native Title Act 1993* (Cth).

*Water Act 1989* (Vic).