



ENGINEERS
AUSTRALIA

National Water Reform 2024 Inquiry

Engineers Australia's submission to the
Productivity Commission

National Water Reform 2024 Inquiry

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Introduction

Engineers Australia appreciates the opportunity to provide input to the Productivity Commission's Inquiry into the National Water Initiative (NWI) and the National Water Inquiry 2024. This submission has been developed to highlight the many interactions between water planning and engineering and highlights areas of agreement, areas that may need to be strengthened and some that may need to be included.

Engineers are essential providers of integrated delivery of water, wastewater and stormwater infrastructure and services, contributing to the full suite of water security, public health, environmental and urban amenity outcomes. Their involvement encompasses all aspects of water policy, governance, management and compliance ensuring the efficient and sustainable use of water resources and the best management of the total water cycle.

Engineers Australia has long been active in water governance and management through interactions with governments, peak bodies and our members to bring about better water governance and management, for a more resilient future. This submission has been developed in conjunction with members of the Queensland Division Committee, the Queensland Water Panel.

About Engineers Australia

As Australia's national body for engineering, we are the voice and champion of our 120,000-plus members. We provide them with the resources, connections, and growth they need to do ethical, competent and high-value work in our communities.

A mission-based, not-for-profit professional association, Engineers Australia is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community. We back today's problem-solvers, so they can shape a better tomorrow.

Contact

To discuss the points raised in this submission further, please contact policy@engineersaustralia.org.au

A holistic approach to water

Water is essential to our ongoing health and well-being, and the limited and valuable water assets we have should be managed through a comprehensive water policy, like health and education. Engineers Australia recommends taking an integrated water management approach to both achieve desired outcomes and broaden the delivery role of water utilities to encompass improved community and environmental conditions. This is the guiding principle of Engineers Australia's [Queensland Water Policy](#), which is also applicable in other jurisdictions and nationally. As a useful reference, Engineers Australia also points to an international example of the UK Plan for Water.¹

This policy provides recommendations on how to achieve an integrated approach to manage water sources. A fragmented approach to managing water resources will not effectively manage the risks. The recommended whole of system approach aligns the governance of water with the water cycle in the flood to drought continuum, and sustainable management of water resources within the environment for use by the community.

Recommendations include:

1. Develop system governance of the total water cycle by state and territory governments.
 - Integrate design guidelines and standards to better enable management and delivery of water cycle outcomes (such as catchment to estuary transects, for all surface water, groundwater and marine sources).
 - Undertake a risk-based assurance and prioritisation approach to programs and projects based on science and engineering principles (for example the adoption of science-based targets for protection of aquatic ecosystems).
 - Integrate water management planning at a systems level at the outset, to enable better decisions.
 - Improve resilience to floods through floodplain management.
 - Introduce innovative ways of meeting stakeholders needs through adaptive analysis processes.
 - Partner with communities to undertake strategic procurement of services across the sector.
 - Strengthen professional and technical expertise in the public sector as well as professional engineering service providers, including high-risk projects such as dam engineering or drinking water quality services.
2. Develop holistic management of water resources by regional entities (Government owned and catchment based, with independent regulators).
 - Regional entities should develop an integrated water management approach to manage flood risks, stormwater and waterway pollution; water infrastructure; and collection, usage and discharge water resources.
 - Regional entities will require sufficient funding and expertise to manage all engineering and operational aspects of water management (such as NSW Joint Organisations or Queensland Regional Alliances)

¹ [Plan for Water: our integrated plan for delivering clean and plentiful water](#)

- Professional engineering services should be available and should be undertaken by registered professional engineers. This is essential for planning involving high risk public safety such as water treatment processes, dam engineering etc.
3. Exemplify state and territory government leadership through integrated water management.
 - Integrated water management should ensure:
 - All facets of the water cycle are planned and managed to maximise social, environmental, economic and cultural outcomes, enabling the availability of water for a healthy, liveable and sustainable future for the country. Recycled water reuse is available for non-potable uses across communities.
 - Communities can manage water resources achieving a high level of urban amenity.
 4. Develop a national policy with a statewide approach to water security and drought response.
 - A national policy ensures:
 - That the sustainable use of water resources meets the needs for potable, agricultural, industrial, mining, fisheries, environmental, recreational, tourism and cultural uses and is consistent with recommendation three (3) above.
 5. That drought responses and long-term planning is available across jurisdictions for both today and future generations. Each of the entities established in Recommendation two (2) should be required to develop a Water Security Program with a focus on total water cycle management and identify new supply options and infrastructure to meet current and future needs. Develop State-wide Resilience Planning.
 - Best practice guidance should be provided, as a basis for water consumption trend analysis.
 - Cater for national crisis and disaster scenario planning through climate change risk analysis, including natural climate variations.
 6. Enable information and knowledge transfer and greater use of data and digital tools.
 - Expand and maintain the collection, curation and accessibility of water data and associated reports to ensure transparency and authenticity.
 - Use advanced data analytics, artificial intelligence (AI), machine learning and visualisation to produce real-time insights, data collection and sensor systems.
 - Incorporate Indigenous knowledge in water resource management.
 - Facilitate rapid and robust decision making, supported by data and evidence with less uncertainty.
 7. Update data models as a basis for improved decision making.
 - Increase the regularity of data review periods to cater for the challenges and advances in probabilistic modelling.
 8. Proactively support research and development in flood plain analysis and management.
 - Encourage investment and collaboration from water service providers to support research and development in advanced technologies for instrumentation, telemetry and remote sensing,

advanced computing techniques, such as artificial intelligence (and machine learning) developed to improve the efficiency of asset management by iterative learning.

- Determine best practice water management techniques to improve system efficiencies and strengthen the capacity to cope with a range of conditions. Experience and learnings from other cities and utilities should be considered in understanding implications of future trajectories.

Comments on the National Water Initiative objectives

Key comments

Engineers Australia supports a review and a well-articulated NWI and the restoration of a National Water Commission or similar body to coordinate NWI implementation by the states.

Engineers Australia recommends the NWI is updated to include the concepts and recommendations as outlined and the new NWI is implemented by state governments through regulated entities established to manage water holistically and at the catchment or regional level.

The regulated entities should be a combination of structures as there is no one size fits all approach but should be a combination of state and local government ownership. These governance structures should be collectively accountable for implementing the NWI.

Other comments

Clear and nationally compatible characteristics for secure water access entitlements

The objective of clear and nationally compatible characteristics for secure water access entitlements is supported by Engineers Australia.

Whole of system water resource management must aim to achieve effectiveness and efficiency of:

- Water allocation between competing interests (e.g. environment, communities, agriculture, and mining);
- Water transmission and distribution; and
- Water use and value.

Engineers Australia supports the adoption of principles which ensure water is managed sustainably and a 'multiple use and fit for purpose' agenda is considered in the allocation of water. Integrated water management means that water may be used multiple times and from different sources. A hierarchical strategy should be adopted and integrated into multiple use regimes.

For example, water may be allocated to the environment for critical/high value ecosystems, but such water can be used after fulfilling environmental needs, by agriculture or recharging aquifers or to reconnect the water cycle. Similarly, environmental flows can be delivered more efficiently by piggy-backing the flows. It is understood and accepted that some will be consumed or lost through various system losses, but the objective remains the same. Recycled water can be used the same way, for multiple uses. These adaptive processes need to be included in access entitlements. Given the increasing effects of climate change, environmental concerns and industrial needs these regimes need to be adaptive and based on science accepted by stakeholders. They should also always seek low evaporation multiple use outcomes.

Transparent, statutory-based water planning

Engineers Australia supports transparent, statutory-based water planning. However, there are instances of conflicting and contradictory advice, either from different departments or from within the same department. Having an overarching set of principles for universal adoption, and coordination between departments to translate into objectives and actions, is needed.

Statutory provision for environmental and other public benefit outcomes, and improved environmental management practices

Planning instruments need to be linked together, with water planning a central aspect. Where objectives are not articulated well enough, conflicts in catchment priorities can occur, resulting in confusion and delaying decisions.

Complete the return of all currently overallocated or overused systems to environmentally sustainable levels of extraction

Using the integrated water management approach will assist with the correct allocation and management of water to return overallocated systems to environmentally sustainable levels. It would also assist with the opposite where under allocated systems which can be used for regional development are not used. Catchment based water authorities given responsibility to meet regional priorities would prevent or address these problems.

Clarify the assignment of risk arising from future changes in the availability of water for the consumptive pool

Increase in the use of data will support decisions looking at the availability of water for the consumptive pool. The use of new technologies (such as AI) will assist in making sure decisions are made with more certainty. Making conservative decisions because of a lack of data may impact the prosperity of regional communities.

Engineers Australia recommends giving increased priority and greater investment toward developing commonly available information to support those who need inputs to their modelling and analysis.

Water accounting which is able to meet the information needs of different water systems in respect to planning, monitoring, trading, environmental management and on-farm management

Engineers Australia recommends the NWI include best practice processes for the sustainable use of water and not just the measurement mechanisms.

Flood management and community protection

Previously outlined in Engineers Australia's interim response to the findings of the 2020 review, we are concerned that flood management is not adequately addressed. Engineers Australia believe that catchment management (in relation to waterway health) and flood management need greater focus within the NWI. With the impacts extreme weather events are having on the environment, these need to be better reflected in the NWI objectives.

Engineers Australia recommends the NWI should require responsible entities to examine their flood risks and take steps to proactively protect communities. Just as is the case with drought security we need to address flood security.

Comments on the Terms of Reference

We agree with the Terms of Reference, however we also recommended the following are considered for review.

- Progress and achievements made on initiatives (including legislative, jurisdiction, governance, and the provision of guidelines and tools) towards better-integrated water management and circular economy.
- Progress and achievements in ensuring all water related policies and regulations are integrated and aligned.
- Progress and achievements made on using purified recycled water (PRW) and stormwater for potable reuse. This includes the required legislative changes. It appears not much progress has been made in two decades since the National Water Initiative (NWI) was signed in 2004. Refer two examples provided in the Appendix.
- The allowance of stormwater discharge into rivers. Consideration should be given to following some leading organisations to establish KPIs for stormwater capture and discharge.
- Whether carbon neutral is adequate due to Australia's late response to tackling climate changes. The aim should be achieving positive environmental outcomes.
- Government and industry efficiency in making water infrastructure investment decisions and the delivering water infrastructure projects.
- Should a standard be established, and legislative requirements be implemented, for improving the water infrastructure system's resilience against known and unknown risks (including natural disasters).
- Progress and achievements made on water security plans for the big and small regions. It is recommended that flood security plans be developed as well.
- Progress and achievements made on data sharing and digital transformation for better decision making.
- Progress and achievements made in initiatives to provide the necessary support including engineering to the smaller regions.
- Progress and achievements made on initiatives to support research and development.

Appendix

Details specific to Queensland:

- Holistic management of water resources by regional entities

The application of consistent governance principles adapted at scale from catchments to Basins. For example, a very large basin such as the Murray Darling has a complex and multi government ownership and management model. Large river catchment(s) could be managed by a State and/or Local government owned entity/entities such in South East Queensland. This model could be adapted for other areas such as the Burdekin Catchment. Other catchments could be agglomerated under a regional authority - for example, a Gulf Water Authority for the Flinders, Gilbert, Norman, Staaten, Settlement Creek, Nicholson, Leichardt and Morning Inlet Catchments. The entity size will depend on stakeholder support, institutional viability, resource sustainability and economic feasibility criteria.

- Purified Recycled Water for potable use:

Queensland has a Western Corridor Recycled Water Scheme in place but no effort or resources have been allocated to improve the community's acceptance of PRW. Sydney Water has opened its [PRW demo plant](#) in Nov 2023, however the Qld Government seems hesitant to promote PRW.

- Stormwater harvesting scheme for potable use:

A major development 'Aura' in Queensland has a [proposed stormwater harvesting scheme for potable use](#). This is a significant opportunity in Australia for stormwater harvesting of 2 GL/year for potable use. This opportunity could almost be lost unless there is prompt action from the Queensland Government to offer stronger support and incentives to make this scheme viable and acceptable to local government and service providers. The success of this initiative has the potential to pave the way for similar schemes in other major developments, such as Beerwah East and Caboolture West, making a more significant contribution to the water cycle and water security.