ENGINEERS
AUSTRALIA

National Water Reform

Response to Productivity Commission Issues Paper

August 2020

Engineers Australia
11 National Circuit, Barton ACT 2600
Tel: 02 6270 6555
Email: publicaffairs@engineersaustralia.org.au

www.engineersaustralia.org.au

Table of Contents

1. About this submission

1.1 Engineers Australia

Engineers Australia is the peak body for the engineering profession in Australia. With about 100,000 individual members across Australia, we represent individuals from a wide range of disciplines and branches of engineering. Engineers Australia is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community.

Engineers Australia's response is guided by our Charter and Code of Ethics which states that engineers act in the interest of the community, ahead of sectional or personal interests towards a sustainable future. Engineers are members of the community and share the community's aspirations for Australia's future prosperity.

1.2 Introduction

The Intergovernmental Agreement on a National Water Initiative (NWI) recognised the "continuing national imperative to increase the productivity and efficiency of Australia's water use, the need to service rural and urban communities, and to ensure the health of river and groundwater systems by establishing clear pathways to return all systems to environmentally sustainable levels of extraction." The objective of the Agreement was to provide "greater certainty for investment and the environment" and to "underpin the capacity of Australia's water management regimes to deal with change responsively and fairly". (Clause 5, NWI).

With economic, social and environmental shocks coming in rapid succession over recent years, the necessity of providing a robust water management regime that can deal with change responsibly, fairly and sustainably is of even more importance.

This submission has been prepared by Engineers Australia's National Committee on Water Engineering to provide input to the Productivity Commission's Inquiry into progress on National Water Reform, based on the Commission's May 2020 Issues Paper. The Productivity Commission's information requests, drawn from the Issues Paper, are included at the head of the following sections. Where appropriate, we have included key recommendation at the end of each section.

We support the Productivity Commission in its conduct of this inquiry, and trust that the following input will assist in the review of this critical sector for Australia's future wellbeing and prosperity.

1.3 Executive summary

This submission has been prepared by Engineers Australia's National Committee on Water Engineering to provide input to the Productivity Commission's Inquiry into National Water Reform. Based on the Commission's May 2020 Issues Paper, Engineers Australia provides the following recommendations:

1. Engineers Australia recommends that regular assessment of progress against the National Water Initiative (NWI) elements include the formal review of water resource monitoring systems, the fundamental data networks on which Australia's water systems are managed and assessed. This should include the application of a report card approach to the regular review of the nation's stream gauging network.
2. Engineers Australia advocates for strengthening of the NWI to include further guidance and requirements associated with water resource data systems, key water management implications for land use planning and regulation, management of both normal and extreme conditions, and defining allocations for non-consumptive users.
3. To assist in the update of the NWI Engineers Australia advocates for Commission review of water management practice during past emergencies and review of provisions in water plans for future emergencies and for climate change.
4. Engineers Australia recommends the review of water accounting and compliance against existing national guidance, and then an update of applicable regulations and guidance to strengthen the management of this critical NWI element. Consideration of the positives and negatives of moving towards real-time reporting of water diversions against entitlements is also recommended.
5. Engineers Australia recommends continued investment in basic hydrological and ecohydrological research, and the long-term and targeted data monitoring networks that underpin them, to provide a strengthened knowledge base for future water resources development, management and reform.

6. Engineers Australia recommends that the update of the NWI should involve a broadscale co-design process to provide the foundation for effective engagement on indigenous water values and knowledge as the basis for a sustainable and positive future.
7. Engineers Australia advocates for Commission review of the regulations, guidelines and practices associated with directing and guiding the actions of water utilities during extreme conditions and when providing public benefits such as water monitoring networks, firefighting supply, flood mitigation, and source quality management.
8. Engineers Australia recommends that the Commission should evaluate options for improving the technical ability of small regional water suppliers to manage systems in remote areas, especially in terms of the expertise on tap, the availability of water data, and planning for drought.
9. Engineers Australia supports further efforts to break down identified impediments to the application of Water Sensitive Urban Design/Integrated Water Cycle Management (WSUD/IWCM) principles, and emphasises that all urban water engineering options should be evaluated based on their merits and that actual benefits and costs should be assessed post-implementation.
10. Engineers Australia recommends that all water infrastructure projects should be evaluated based on their merits, including input from the engineering, environmental, economic, social and cultural fields, and considering both short term and long term, and direct and indirect, benefits and costs. After implementation, a review/s should be undertaken to evaluate the actual benefits and costs of the implemented project, comparing actual benefits and costs to those projected in the project proposal studies.
11. Engineers Australia requests and recommends that a representative of Engineers Australia's National Committee on Water Engineering is invited to serve as part of the Inquiry's stakeholder working group.

Further information on the above is included in the body of this submission.

1.4 Contact details

To discuss the contents of this submission further, please contact Sybilla Grady, Senior Policy Advisor,

2. Assessing jurisdictional progress

Information request 1

The Commission welcomes feedback on:

- Whether the signatories to the NWI are achieving the agreed objectives and outcomes of the agreement;
- Which elements of the NWI have seen slow progress;
- Whether there are cases where jurisdictions have moved away from the actions, outcomes and objectives of the NWI, and;
- Any other data and information sources that might be useful for assessing progress.

Engineers Australia supports the objectives of the National Water Initiative, and most of the principles outlined in the agreement remain pertinent today. In particular, the conduct of regular reviews on progress, such as this Productivity Commission Inquiry, is supported. Significant progress has been made but, given the criticality of water resources to the future health and prosperity of Australia's population and environment, ongoing national oversight and guidance of water resource development and management is vital.

The Productivity Commission is encouraged to formally review progress against the eight elements of the NWI at the state and catchment/regional scale, and to explicitly report the results of this review at this scale in your report. There is great diversity across Australian catchments and regions, with each area having its own management and development challenges.

It is noted that the Productivity Commission intends to also consider *areas of water management that are not explicit in the actions agreed to in the NWI but are essential to achieving its outcomes*. The issues paper gives the example of *compliance with water access conditions*, which *underpins both the integrity of the entitlement system and public confidence in water management*.

These foundational building blocks are often critical to the effective management of water resources, and it is agreed that the lack of detailed explicit requirements in the NWI should not limit the Productivity Commission's consideration of such fundamental basics to best practice water management.

The implementation of effective compliance mechanisms at the state and catchment/regional level are one such essential building block. Engineers Australia supports the Productivity Commission's review of this area, inclusive of both the passing of regulatory provisions guiding compliance activities and the policing of such provisions. Other areas for consideration include the development and application of education programs on regulatory and compliance requirements for water users, and the level of reporting on compliance related activities in each state/region.

Another critical and fundamental building block, underpinning virtually all the NWI's eight elements, is the collection and management of water resources data. There is a wide range of scientific information that benefits best practice water management, from daily rainfall records to the response of a species to a specific contaminant, but the fundamental numerical data that underpins modelling, assessment and compliance of water resource systems is a key foundational requirement. This data includes rainfall, evaporation and streamflow data, aquifer levels, diversion/usage data, water trading data, and data on losses and operational requirements.

Given the criticality of basic water resource data to effective water management, a formal review of water resource data collection and management systems across Australia by the Productivity Commission is strongly recommended as part of this Inquiry.

Australia's highly variable climate means that long records of local climate data are required. In order to be able to effectively assess extreme events in a locality and spend resources in a balanced and effective manner, long term rainfall and streamflow records (at a fine time step) are required. Often the 1% Annual Exceedance Probability (AEP) event, commonly referred to as the '1 in 100 year' event, is used in public discussion as a rare event that our systems and infrastructure should survive, not without damage perhaps, but without catastrophic impacts. Recent examples of rare events have highlighted the need to plan for more extreme conditions than may have been typical previously. Additionally, assessment of climate change impacts provides a further impetus for long term records.

Rainfall, evaporation and other climate data stations in Australia are typically managed on a national basis by the Bureau of Meteorology (BOM), with data readily accessible to the public through the BOM's website. The spatial coverage of rainfall stations tends to be relatively dense, evaporation stations less so. We expect that the review will find that the management

of climate data is relatively good, but there may be a need for increased spatial coverage of the data required to accurately estimate evaporation from water bodies and landscapes in non-coastal areas.

Streamflow stations are not typically managed at federal or state level. Stream gauging networks have grown organically and tend to be operated by a mix of agencies including councils, water utilities, state government water agencies, and the BOM. The ongoing effectiveness of these stations are subject to budgetary issues, and significant decreases in coverage have occurred in several states over recent decades. The data can be hard to access, being held by different agencies and often not published on-line (although the BOM's Water Data Online is making progress to becoming a one-stop shop for such information).

Different formatting and recording conventions can complicate synthesis of this data. Gauging station data has a higher need for metadata, such as rating curves, cross-sections, quality codes and equipment changes, which increases the need for expert database management. The rating curves at gauging stations, critical to converting the measured level to an estimated flow, are often based on low level flow measurements, with higher flows involving significant extrapolation[1]. Quality codes, critical for understanding the uncertainty associated with a measurement, are often inconsistent[2]. A recent review of urban gauging stations, conducted as part of the update of Australian Rainfall and Runoff, identified a significant lack of gauging stations in small catchments in fringe/developed areas of major urban centres.

It is expected that the Commission's review of stream gauging will uncover a significant need for additional gauging stations in rural and remote areas and in small urban catchments, a need for improved high stage ratings. It may also find issues with the national coordination, guidance and reporting of such data.

Recorded data related to water diversion and trading is often collected for financial purposes, although there may be issues in the reporting of such data. There are valid commercial and privacy issues associated with the reporting of such information but, as a rule, transparency is essential and provides increased trust in the system and simplifies compliance and assessment.

The temporal resolution of diversion data may also be an issue; quarterly usage data may be sufficient for invoicing and compliance evaluation but is of limited benefit for future modelling and planning. Consideration of the appropriate measures to apply to such information (perhaps bulking to a regional total, or releases after a time delay) is recommended. This will provide important information on the use of this public resource and inform future planning and analysis, without causing excessive privacy or commercial issues.

In summary, the primary water resource data type that Engineers Australia has concerns about is the streamflow gauging station network. As such, a report card approach, applied at the state and catchment/regional level, would have significant merit in assessing and improving the nation's streamflow gauging station network. The gauging station network in each area could be assessed and rated as part of the regular Productivity Commission reviews, perhaps using an A to F scale as typically applied in report card approaches. The report card approach should consider issues such as spatial coverage, proximity to key impact areas, quality of the control and rating curves, length of record, relevance to compliance assessment and the potential for future development. It is expected that regular rating of gauging station networks by a national agency would assist in encouraging the range of federal, state, local and corporate agencies involved in streamflow gauging to improve their data quality and spatial and temporal coverage, for the benefit of Australia's current and future generations.

Recommendation 1 - Engineers Australia recommends that regular assessment of progress against the National Water Initiative (NWI) elements include the formal review of water resource monitoring systems, the fundamental data networks on which Australia's water systems are managed and assessed. This should include the application of a report card approach to the regular review of the nation's stream gauging network.

[1] Many stream gauges use simplistic 'straight line' paper-based extrapolation techniques for high flow ratings, while modern hydraulic modelling allows more sophisticated extrapolations to be made. In Victoria, for example, less than 10 of the ~800 stream gauges have high flow ratings determined through hydraulic modelling.

[2] All level and flow measurements should have a code that indicates their quality. Unfortunately, there has been a proliferation of codes between stream gauging organisations. There has been admirable work by the BOM to standardise to a small number of codes but there does not seem to have been significant buy-in by the states and territories. Poor practices in assigning quality codes and inconsistent quality codes increase the difficulty of using the data, adds cost, and may lead to inappropriate design recommendations.

3. Adequacy of the NWI to meet emerging challenges

Information request 2

- Is the NWI adequate to help Governments address the identified challenges?
- Are there any other current or emerging water management challenges where the NWI could be strengthened?

Engineers Australia considers that most of the principles outlined in the NWI remain relevant today, and a range of NWI guidelines have been released providing additional guidance in key areas[3]. However, several current andemerging water management challenges have highlighted areas where further detail would be beneficial. As such, continued strengthening of the NWI into the future is supported. Just as the 2004 NWI effectively strengthened the 1994 COAG water reform framework, a modern update of the NWI would allow further detailed guidance and requirements on emerging issues, as well as an update of the principles and language to reflect current social and cultural mores.

Key current or emerging challenges, which would benefit from increased attention, include:

Basic water resource data networks

As discussed in Sections 2 and 4, a strengthening of requirements, guidelines and review associated with basic water resource monitoring systems is advised. Strengthening the NWI in relation to these fundamental data sets will assist in meeting virtually all eight elements of the current NWI, as well as providing a robust foundation for the management of water resource systems with respect to current and emerging issues such as climate change and extreme events.

Interactions between land use planning and water resource management

Links between water resource management and land use planning and development may benefit from strengthening in relation to some issues in various jurisdictions. Three such issues (Fire Water Supply, Flood Mitigation, Water Supply Catchment Runoff Quality Management) are described below:

Fire Water Supply

- Implementation of the NWI has focused significantly on water for consumptive supply and water for the environment. It appears there has been limited attention on arrangements for meeting other public benefit outcomes associated with water infrastructure such as water for fighting fires.
- Fires may be massive in scale and threaten entire regions, or smaller urban fires that threaten one house and its immediate neighbours.
- Historically water service providers/utilities were primarily run by government, but many have since been separated into government owned corporations or private companies. (Note that the separation of regulators and operators was a key recommendation of the Council of Australian Governments (COAG) and is reflected in s74 of the NWI.)
- There are many drivers placing pressure on the firefighting capacity of urban water supply systems, such as increased infill development, reduced distances between dwellings, and bigger background demands on old buried infrastructure. The capacity of urban water supply systems is often driven by the emergency supply requirement of firefighting; most of the time the extra capacity is not required, so years can go by without the general user realising their service has effectively reduced. Smaller urban fires don't tend to become national news, but the cumulative effect on the economy is significant. Often no one directly pays for firefighting water, and the considerable extra capacity is expensive, and hence corporatised water utilities may not be incentivised to upgrade legacy systems.
- In forest fires, regional water storages can be used as a source of firefighting water, and the need for firefighting supply may coincide with drought conditions where water users are already under stress. The water taken to fight fires may, without clear guidelines, disproportionally affect some user groups over others. While the volumes involved may not be huge, and many would not begrudge the use of water for fighting a fire, it is an important principle of the NWI that all water use is accounted for. With one key focus of this Inquiry on emergencies and extremes, review of arrangements for forest fire water supply would be appropriate.

[3] https://www.agriculture.gov.au/water/policy/nwi/guidelines-water

- It is therefore recommended that the Productivity Commission reviews regulations and practice associated with meeting firefighting water requirements, at both the local residential and regional rural fire levels, as part of arrangements considered for meeting public benefit outcomes associated with water supply.

Flood Mitigation

- Another public benefit often provided by water infrastructure is flood mitigation.
- Development near water infrastructure can have major implications on the safety, performance and cost of operating that infrastructure[4]. It is considered important that new development pays its share of the additional costs imposed on water infrastructure by that development, whether that development becomes a consumptive user of that scheme's water or not. Without an appropriate development charging regime, developers are not seeing a price signal on why development in a certain location is less desirable than in another location where, for example, the property is not at risk from a dam break event. If those in flood prone areas are not paying their fair share of such costs, the bill must then be paid by the general taxpayer.
- Engineers Australia thus recommends that the Productivity Commission reviews regulations and practice associated with providing and maintaining flood mitigation services from water supply dams.

Water Supply Catchment Runoff Quality Management

- Development in the catchment areas feeding water supply dams has direct cost implications for the cost of water treatment on water supplies drawn from that storage. Some catchments around the country have high levels of protection, with only limited development permitted, while others permit a wide range of activities.
- The cost implications may be relatively steady, depending, for example, on the density of stocking allowed, or spikes in poor water quality which may be associated with extreme events (such as a storm after a forest fire). Such events can release pollutant/s that result in closure of the water treatment plan, which in turn limits water supply, or transfers reliance to higher cost sources such as desalination.
- The options are complex: problematic development could be banned, development could pay an appropriate fee to the water utility, or the utility could pay landholders not to develop or to implement runoff quality improvement measures.
- Engineers Australia advocates that the Productivity Commission reviews arrangements associated with protecting source water quality in water supply catchments, with the aim of providing recommendations and guidance on management of this issue in the public interest.

'Normal' conditions and extreme events:

- The 'average' year rarely occurs in Australia. With Australia's significant natural climatic variability, water resource plans, where possible, must explicitly cater for events that are reasonably foreseeable, perhaps up to the 1% AEP ('1 in 100 year') conditions.
- As Australia tends to be in either wetter or drier phases for some periods of years, it may be possible to develop a 'dual mode' system or similar. To better incorporate an explicit consideration of climate variability, the next wave of reforms should examine the potential for alternative planning andgovernance arrangements for typical wet and dry periods (e.g. El Niño/La Niña in the south east of Australia) and the criteria for swapping between these arrangements. This could include leasable access rights to marginal land and water in wet times for both environmental watering and agriculture andurban uses, with more stringent allocations in the dry times. Financial arrangements to allow landholders to wait for the next wet period (and/or diversify their income generating activities) should be considered. This is of particular benefit with the potential increased frequency and severity of weather events associated with climate change.
- Extreme events and climate change disproportionally affect some user groups, so it is prudent to consider the potential effects ahead of time. Where possible systems should be designed so all sectors are positively or adversely affected in a balanced manner by extreme events or long-term shifts in climate patterns. As one example, the traditional 'horizontal' apportionment of stored water in dams means that users with the top compartment are the most vulnerable to drought and climate change effects. A 'vertical' apportionment approach, such as capacity sharing, will typically provide a more equitable framework to deal with such events.
- Emergency provisions should be reserved for unprecedented and unforeseen events, rather than the more predictable variability of the Australian climate. While the nature of extreme events often makes it difficult to develop detailed rules for the operation of water systems during such events, the development of guidelines and

[4] This issue has been referred to as 'Consequence Creep', that is, the consequence of a dam failure when the dam was originally built may have been *Low* but is now *High* owing to increased development downstream. The new *High* rating means a significantly bigger spillway is required, costs for which can run into the hundreds of millions.

adaptive frameworks that provide support to the professionals managing systems during such unprecedented circumstances is essential.

- As discussed in Section 5, the federal government in 2017 released a NWI module providing guidance on considering climate change and extreme events in water planning, which reflects many of the principles outlined above. However, it appears that this guidance has not yet been fully implemented in some localities. It is therefore recommended that the review of jurisdictional progress considers progress against the guidance in this module and assesses methods likely to result in improved outcomes.

Allocation for nonconsumptive users

- There are several non-consumptive users who benefit from water resources but do not 'consume' the water in the traditional sense. Environmental use is perhaps the most obvious, and much of the previous NWI was focused on this area. However, there are several other non-consumptive users of water, including hydropower and recreational, social and cultural uses of water.
- There are certainly challenges associated with defining allocations for non-consumptive users, but there are also opportunities, such as a hydropower company and an irrigator working together to meet both their requirements.
- Review of this area will assist the upgrade of the NWI to meet future challenges.

Recommendation 2 – Engineers Australia advocates for strengthening of the NWI to include further guidance and requirements associated with water resource data systems, key water management implications for land use planning and regulation, management of both normal and extreme conditions, and defining allocations for non-consumptive users.

4. Future reform directions

Information request 3

- The Commission welcomes feedback on the matters that should be considered for inclusion in a renewed NWI.

As stated in Section 3, while most of the principles in the NWI remain highly relevant, a number of current and emerging water management challenges have highlighted areas where further detail would be beneficial. Therefore, the update and renewal of the NWI is supported.

Engineers Australia recommends that the NWI is updated to include the key issues identified in the regular reviews of progress against the NWI made by the National Water Commission (up to 2015) and the Productivity Commission (2015 to date). It is also recommended that the NWI is updated to more explicitly detail guidelines and requirements associated with the issues discussed in Section 3 and the other sections of this submission.

5. Water entitlements and planning

Information request 4

- How effective are water plans at managing extreme events such as severe drought?
- Are NWI principles being applied at these times?
- What steps have been undertaken – or should be undertaken – to plan for long term changes in climate?
- What lessons have recent extreme events (bushfires and COVID-19) provided for planning?

Managing unusual and extreme events such as drought, fires and floods is a challenging task. As discussed in Section 3, the 'average' year rarely occurs in Australia. With Australia's significant natural climatic variability, water resource plans, where possible, must explicitly define rules for events that are reasonably foreseeable, perhaps up to the ~1% AEP ('1 in 100 year') drought conditions. These rules could be categorised into several response tiers. Each tier requires a specific trigger (related to total volume in storage and/or aquifer level, river flow, SOI, population, etc.) and associated water sharing rules. Providing explicit rules for most situations has several benefits: it allows users to effectively plan, provides a foundation for valuation of allocations and water trading, etc. Usually, the rules would move from being definitive statements to guiding principles, descriptions of options and implications, reflecting the likely unprecedented nature of such extreme conditions.

It is noted that a module to the NWI has been released[5] providing guidance to support water planners and managers in managing severe droughts and climate change. The Productivity Commission should consider the actions of various jurisdictions in managing extreme events over the past three years in reference to this guideline. However, this guideline is relatively recent, with most 'in force' plans were developed prior to release of this information.

There is a human tendency to suspend normal procedure in response to extreme events, sometimes opting for reactive implementation of actions thought to directly address the event. For example, during the recent drought in NSW four water sharing plans were suspended and emergency legislation was implemented to allow the construction of emergency town water supply works outside of water sharing plan requirements in drought affected areas. These actions indicate that the existing water plans, at least, did not accurately reflect societal expectations for water sharing during such a severe drought event.

Emergencies are generally stressful and there is typically insufficient time 'in-event' to rigorously assess the benefits and costs of various options. Following pre-set rules may not be favoured by the public in the heat of an emergency. Also, emergencies often have unique features and rules written 10 years earlier may not appropriately cater for the reality of the event.

Similarly, perspective may shift after the event. Any review of emergency water management actions must carefully consider the knowledge and systems in place at the time of the event, as well as the social, technical and time pressures on the elected official, employed professional or volunteer citizen making decisions in such an event.

Notwithstanding the difficulties of making decisions in such circumstances (or in fact because of that) good planning for emergencies is critical, and part of this is learning from past events. Review of operations during unusual circumstances or emergencies is recommended (with the focus on learning how to do better rather than assigning blame). Lessons learned, relevant to water management, should be documented after such events and the NWI, Water Plans and jurisdictional water management arrangements updated based on those learned lessons.

Lastly, it is important that the risks and trade-offs associated with water management in extreme events are clearly communicated to the public. With an improved understanding of the probability and consequences of extreme events, resilience will be improved and individuals and the community can take appropriate actions to plan for such events. It is difficult to completely remove the shock and impact of an extreme event but good communication of the risks, and the actions taken by water authorities to prepare for and manage the emergency, provides the best opportunity for a shared understanding, reduced impacts, and a quick recovery.

Recommendation 3 – To assist in the update of the NWI Engineers Australia advocates for Commission review of water management practice during past emergencies and review of provisions in water plans for future emergencies and for climate change.

6. Water accounting and compliance

Information request 5

- How could the NWI be amended to support best practice monitoring and compliance across jurisdictions?

Engineers Australia agrees with the Productivity Commission that water use accounting and compliance underpins the integrity of the entitlement system and contributes to public and investor confidence in water resource management. Clearly water use compliance should be part of the NWI and there is a need for consistency between the states on how this is achieved.

Water Accounting is one of the eight key elements specified in the 2004 NWI, and the NWI includes several clauses specifying water accounting requirements, notably Section 80 to 89 and Schedule F. The Productivity Commission should focus on these requirements in the review of jurisdictional progress against the existing NWI requirements. Water accounting is the foundation of compliance, and thus the procedures and systems in place for water accounting are a critical requirement for compliance.

As identified by the Productivity Commission, the NWI provides less guidance on compliance requirements, but s89 includes a brief mention of requirements for compliance and enforcement actions, indicating that a national guideline is required. The national guideline on metering, including associated compliance and enforcement actions, required by s89 has been

[5] https://www.agriculture.gov.au/water/policy/nwi/climate-change

prepared[6]. Again, particular attention should be paid to this guideline in the review of jurisdictional progress against the existing NWI requirements, for example, how the jurisdictions have met the requirement for open reporting of audit reports. As an example, one independent review conducted in the past three years was located online[7], which found a high level of performance in developing and establishing Water Plans but deficiencies in metering, water accounting, and compliance and enforcement activities.

Once the Productivity Commission has assessed water accounting and compliance and enforcement practice in the jurisdictions against the existing guidance, the Commission will be in a good position to develop the additional regulations, guidance and procedures necessary to improve performance in this critical area.

Existing reporting generally focusses on annual reporting of water take at the basin, aquifer or scheme level. It is recommended that the Productivity Commission reviews existing annual water use reporting around the nation, such as the Victorian Water Accounts[8] or the MDBA transitional SDL water take reports[9], identify the best elements and use this to formulate updated guidance for all jurisdictions. A key element is to ensure that actual take is clearly and simply presented next to the permitted take.

Many water users have their diversions directly metered. However, in some circumstances direct metering is impractical, such as capture of overland flow via gravity diversion systems, or diversion by very small users where the cost of a meter is excessive. It is recommended that the Productivity Commission request that each jurisdiction advise their procedures for regulating and 'metering' (estimating) all types of water diversion, analyse the responses, and use this to inform development of the updated national regulations and guidance[10].

Historically, some jurisdictions have focused on regulating diversion from surface flow, and then found that issues were caused because opportunistic users move to take from groundwater. When groundwater is regulated, opportunistic users then move to take from overland flow. If the Productivity Commission identifies that some jurisdictions are not adequately regulating and monitoring overland flow, for example, action would be prudent.

Digital and communications technology has advanced significantly over recent years, and meters that report in real time to the web are now available, with costs coming down as the technology matures. Consideration should be given to reporting diversions against water entitlements publicly, in real time, and metered diversions against permitted take. Such an option is not without issues: cost, data accuracy, privacy and commercial interests would all need to be considered. However, this would increase transparency, simplify compliance and reporting requirements, and provide a detailed database for later assessments.

Live reporting would be particularly beneficial for water harvesting diversions, where the timing of the take is a critical element of the entitlement to divert. As discussed in Section 2, issues associated with privacy or commercial interests might be addressed through bulking to daily totals or by publishing data after a time delay. Data accuracy issues might be addressed in a similar manner to the live publishing of climate data, with the latest data published in real time, but if issues are identified then corrections can be made later. The evaluation of where the public interest lies with this issue is not straightforward, and hence careful consideration of this option is recommended.

Even without the implementation of a national public system for real time water use reporting, there are emerging issues with privacy and safety related to water management. What is likely needed in future reforms are statements of principles and guidelines around the responsible use of monitoring technologies for understanding system function, changes and compliance. It is increasingly evident (with recent attempts to use remote sensing to identify water 'theft', and the detailed personal information inferable from urban smart metering systems) that considerations of data privacy, security and guidelines for responsible collection of data and public release are necessary.

Under Engineers Australia's code of ethics, all members have the responsibility to *Practise engineering to foster the health, safety and wellbeing of the community and the environment*. Current connected information systems, data privacy and cyber-security concerns mean that there are increasing debates on what forms of technological surveillance are in fact beneficial or pose a risk to individuals. For example, there is a risk of community backlash and associated safety concerns over accusations of misappropriating water that need to be appropriately investigated; or increased dangers for victims of domestic violence due to the misuse of proxy activity logs that are available from home water use and associated data

[6] https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/water/national-framework-non-urban-water-metering.pdf
[7] https://www.dnrme.qld.gov.au/__data/assets/pdf_file/0010/1396756/independent-audit-water.pdf
[8] https://waterregister.vic.gov.au/about/news/279-victorian-water-accounts-2017-18-now-available
[9] https://www.mdba.gov.au/publications/mdba-reports/transitional-sdl-water-take-reports
[10] In some cases, the Productivity Commission may wish to recommend another party to develop the updated technical guidance, for example the Australian Department of Agriculture, Water and the Environment.

streams (e.g. electricity/gas). New technology often brings both benefits and challenges. As a society, it is important to weigh up the benefits and impacts and develop appropriate guardrails before the emerging issues are too difficult to manage.

Recommendation 4 – Engineers Australia recommends the review of water accounting and compliance against existing national guidance, and then an update of applicable regulations and guidance to strengthen the management of this critical NWI element. Consideration of the positives and negatives of moving towards real-time reporting of water diversions against entitlements is also recommended.

7. Environmental water management

Information request 6

- Are environmental outcomes specified clearly enough in water plans to guide management actions, monitoring and accountability?
- Are institutional and administrative settings effective in supporting these outcomes? Do environmental water managers have the necessary authority, resources and tools to achieve agreed outcomes?
- Is environmental water management (including planning for use of held water, delivery of held water, use of markets and compliance with planned environmental water) sufficiently integrated with complementary natural resource planning and management frameworks?
- Can environmental outcomes be more cost-effectively achieved with greater and more innovative use of water markets and market-like mechanisms?
- Is the monitoring and assessment of environmental outcomes sufficient?
- How effective has adaptive management and planning decision-making been during the recent drought?
- Do environmental water managers maximise opportunities to achieve social or cultural outcomes alongside environmental watering? How could this be improved?

Environmental water management is particularly dependent on what is both feasible and societally desirable. Many communities in Australia have undertaken considerable work to define these outcomes and underpinning environmental values at both local and basin levels. Some desired outcomes, like integrated natural resources management, have been more difficult with implementation of the NWI policy to separate water entitlements from land rights and ownership. However, seeking very specific environmental watering outcomes has become easier due to the opportunities to move water from lower to higher value ecological environments. This ability to engineer our environment has both significantly positive outcomes in some regions and significantly negative outcomes in others. Specifically, there is a growing body of evidence and practices that demonstrate some local successes in delivering environmental water for specific outcomes. Achieving basin-level benefits and outcomes of broader environmental watering policies remain challenging, due to a range of policy, practice and climate change impacts.

Globally the paradigm of efficiency (economic and hydrological) as an objective of basin-level management is being questioned[11], as is the apparent gap between environmental water policy and effective implementation[12]. The maturity of Australia's water infrastructure efficiency programs put us at the forefront of that debate. Our hydrology, water engineering and water management community has been working hard to evaluate the effectiveness of these systems. The scientific understanding of these hydrological processes and how to effectively model and empirically test the results remains at the frontier of scientific knowledge and is creating interest due to the uncertainties around reasonable extrapolation and assumptions underpinning results (see recent volumes of the Australasian Journal of Water Resources for some of the most recent debates).

Media coverage of this area has been heated, and current methods to 'secure' additional environmental water are still contested by some stakeholders, including scientists, and are leading to diminished trust in the legitimacy of some parts of the recent water reform portfolio. This is causing tensions in the professional water community. Part of the tension is that it is easier to 'see' and directly 'identify' some forms of direct water buybacks than others, such as irrigation system upgrades. And although there are some studies in the Murray-Darling Basin, there is currently insufficient research across different Australian regions to effectively understand the hydrological and cumulative environmental effects of environmental watering facilitated through the market, as well as infrastructure investments and associated development programs, on both relatively natural and highly modified river basin ecologies and the communities that rely on them.

An operational issue facing environmental water managers is the issue of 'shepherding', where water released for the environment from upstream storages needs to be protected from extraction as it travels downstream to where it is required. Review of the success of such practices is recommended. Transparent, real time reporting of the environmental releases and coincident streamflow, water harvesting and overland flow extractions, as discussed in Section 6, would significantly benefit the management and review of such releases.

[11] Perry, C., Steduto, P. and Karajeh, F., 2017. Does improved irrigation technology save water? A review of the evidence, Food and Agricultural organisation of the United Nations, http://www.fao.org/3/I7090EN/i7090en.pdf

[12] Horne, A.C., O'Donnell, E.L., Acreman, M., McClain, M.E., Poff, N.L., Webb, J.A., Stewardson, M.J., Bond, N.R., Richter, B., Arthington, A.H. and Tharme, R.E., 2017. Moving forward: The implementation challenge for environmental water management. In *Water for the Environment* (pp. 649-673). Academic Press.

In summary, continued investment in basic hydrological and ecohydrological research and the data monitoring networks that underpin these investigations is essential and will ensure a strengthened knowledge base for future water resources development, management and reform.

Recommendation 5 – Engineers Australia recommends continued investment in basic hydrological and ecohydrological research, and the long-term and targeted data monitoring networks that underpin them, to provide a strengthened knowledge base for future water resources development, management and reform.

8. Indigenous water use

Information request 7

- What progress are States and Territories making on including indigenous cultural values in water plans, and how are they reporting progress?
- How could a refreshed NWI help Indigenous Australians realise their aspirations for access to water, including cultural and economic uses?

In recent years, collaboration with Indigenous communities and leaders, and development of more appropriate acknowledgements and recognition of this continent's first engineers, technologists and Country custodians have increased. This includes supporting and celebrating the Engineering Heritage and UNESCO Heritage listing of the Budj Bim aquacultural engineering cultural landscape[13] in Victoria, highlighting the exceptional contributions of Indigenous people to managing Australia's water and environment sustainably for millennia. This increase in recognition has had a significant impact on our membership and the communities they serve, including Australia's future engineers.

Engineers Australia's code of ethics focuses on four key areas: 1) demonstrate integrity, 2) practise competently, 3) exercise leadership, and 4) promote sustainability. Here we highlight the sustainability areas of this code:

> ***4.1 Engage responsibly with the community and other stakeholders*** *(a) be sensitive to public concerns (b) inform employers or clients of the likely consequences of proposed activities on the community and the environment (c) promote the involvement of all stakeholders and the community in decisions and processes that may impact upon them and the environment;*
>
> ***4.2 Practise engineering to foster the health, safety and wellbeing of the community and the environment*** *(a) incorporate social, cultural, health, safety, environmental and economic considerations into the engineering task*
>
> ***4.3 Balance the needs of the present with the needs of future generations*** *(a) in identifying sustainable outcomes consider all options in terms of their economic, environmental and social consequences (b) aim to deliver outcomes that do not compromise the ability of future life to enjoy the same or better environment, health, wellbeing and safety as currently enjoyed.*

The current version of the NWI (Clauses 52-54) could be renewed in language and intent through greater engagement with First Nations. This is necessary in order to foster the health, safety and wellbeing of Indigenous Peoples and Country across the continent for current and future generations.

Discussion on Indigenous perspectives on water and its relationships to the responsibilities of caring for Country, as well as to Indigenous law and people's aspirations to develop their own futures based on multi-generational responsibilities, would be beneficial. This could be included in the renewed NWI, or in co-released support documents such as an updated module on engaging Indigenous People[14]. An update of the NWI has the potential to restart discussions and to overcome significant failures in acknowledging Indigenous water policy[15]. An update of the NWI has the potential to protect Indigenous water knowledge and key Indigenous sites and improve trust in our water governance regime. The reworked NWI needs to be one we can all be proud to work towards together.

Progressive development of a broadscale co-design process, led by Indigenous water management leaders, to reform the language and underlying intent of the NWI, and develop a basis for a more appropriate partnership on water futures should

[13] https://whc.unesco.org/en/list/1577/
[14] https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/water/indigenous-engagement.pdf
[15] Taylor, K.S., Moggridge, B.J. and Poelina, A., 2016. Australian Indigenous Water Policy and the impacts of the ever-changing political cycle. *Australasian Journal of Water Resources*, *20*(2), pp.132-147.

be considered. The recent CSIRO publication 'Our Knowledge: Our Way Guidelines'[16] provides an excellent place to start for developing this rework.

Across the country, values and aspirations for Indigenous peoples will likely look very different depending on the degree to which the waterscapes and landscapes are already modified, and it is recommended that the NWI considers other global approaches to managing different levels of modified water systems (like the European Water Framework Directive[17]), so that in each system we *aim to deliver outcomes that do not compromise the ability of future life to enjoy the same or better environment, health, wellbeing and safety as currently enjoyed (EA code of ethics).*

Co-design would have significant merits in delivering a strong platform for engagement on Indigenous water-related values and knowledge in the planning of major new water infrastructure projects, such as developing the north. As discussed in Section 12, such projects must be robustly and transparently assessed by multi-disciplinary teams with input from people with engineering, environmental, economic, social and cultural expertise. Short and long term, direct and indirect, benefits and impacts must be assessed. The close involvement of Indigenous Australians in this process, following processes they have been involved in co-designing, will provide the best chance of developing a sustainable and positive collective future.

Our next generation of engineers and water managers, including those working with Engineers Without Borders, are excited about their work with Indigenous communities to develop appropriate viable and alternative economies based on a range of elements including eco-tourism, clean energy and carbon farming, new technologies, cultural and sustainable production and primary industries. The provisions of the updated NWI will impact Indigenous and non-Indigenous peoples for generations, and thus we recommend a broadscale co-design process for its renewal.

Recommendation 6 – Engineers Australia recommends that the update of the NWI should involve a broadscale co-design process to provide the foundation for effective engagement on indigenous water values and knowledge as the basis for a sustainable and positive future.

9. Water services

Information request 8

- Are the institutional arrangements for metropolitan water service providers fit-for-purpose?
- Is there evidence of inefficient pricing or investment decisions?

While the benefits of institutional separation between regulators and infrastructure operators are recognised, whether the current arrangements provide sufficient clarity, institutional accountability and identification of planning pathways for key water resource decisions is unclear. This is especially with regard to the setting of standards and management of risks to metropolitan water supplies associated with drought. Clarity is required to identify which agency or agencies are responsible for:

- defining the acceptable risk of water shortage during drought;
- infrastructure planning to manage the risk of water shortage during drought;
- the setting of standards for water restriction policies;
- the setting of minimum basic water supply requirements in an extreme drought emergency, and;
- the planning, funding and approval for emergency water supply schemes in an extreme drought emergency.

Secondly, while the corporatisation of metropolitan water utilities has had several advantages, there are concerns regarding a number of public benefit outcomes associated with water supply. These include the issues discussed in Section 3: maintenance and enhancement of foundation water monitoring networks, provision of water for firefighting, provision of flood mitigation services, management of the quality of runoff in water supply catchments, and managing other 'non-fee paying' services which provide public benefits.

Recommendation 7 – Engineers Australia advocates for Commission review of the regulations, guidelines and practices associated with directing and guiding the actions of water utilities during extreme conditions and when providing public benefits such as water monitoring networks, firefighting supply, flood mitigation, and source quality management.

[16] https://www.csiro.au/en/Research/LWF/Areas/Pathways/Sustainable-Indigenous/Our-Knowledge-Our-Way
[17] https://ec.europa.eu/environment/water/water-framework/index_en.html

10.Small regional suppliers

Information request 9

- How can small regional providers best balance affordability with longer-term service quality?
- Are there barriers to effective local planning?
- Is there scope for greater collaboration between small providers?
- When might government support be warranted, and how should it be provided?

And:

Information request 10

- Do water service providers supply high-quality water services in regional and remote areas?
- Are there examples of poor water quality, service interruptions, or other issues?
- Have regional water service providers adequately planned for extreme events?
- Are there sources of data that could be used to benchmark smaller providers' water service levels (with fewer than 10, 000 connections)?

The provision of safe and reliable water supplies with cost reflective pricing can be enormously challenging for regional communities. Major challenges include:

- lack of skilled staff with local expertise;
- lack of data regarding locally available water resources (see discussion on inland and remote gauging station networks in Section 2);
- affordability of solutions that meet acceptable water quality and service reliability standards, and;
- for towns on regulated river systems, lack of transparency regarding their level of exposure to water supply shortage in the event of drought. A high security water access licence doesn't mean zero risk of water shortage.

The Productivity Commission should investigate ways to provide regional centres with access to data and expertise to enable them to make informed decisions regarding the safety and reliability of their water supply schemes. Methods such as the formation or enhancement of national or state-based organisations to provide oversight, guidance and support to small regional water service providers, or the amalgamation of water service providers to achieve the benefits of scale, could be considered. The significant development of remote sensing systems and digital communication technologies is increasing the ability of national, state or large regional based expert bodies to provide specialist professional assistance to water supply system managers in remote communities. However, the de-engineering of many government departments may mean there is only currently a limited body of accessible central expertise. If central support is deemed desirable, there will likely be a need to resource that requirement.

Many smaller local water service providers struggle with issues associated with distance, aging infrastructure, and low population bases. The cost to provide a particular level of service can be vastly different in different localities, a factor that must be considered when setting standards for regional areas. Creating regional water grids may be a solution in some areas, significant synergies could be gained by having sources with different climatic exposure. 'Portable' options, such a trucking water or portable desalination and water recycling plants, may be appropriate for those smaller remote centres with limited local sources, although the tendency of drought conditions to simultaneously hit wide areas of the country complicates the sharing of the required resources.

Regarding benchmarking performance, there is a lot of smaller water service providers. While great care must be taken to consider local conditions, it is expected that smaller water service providers would have sufficient information to enable a reasonable level of peer benchmarking to identify those communities struggling to provide basic levels of supply for health, safety and wellbeing.

Recommendation 8 – Engineers Australia recommends that the Commission should evaluate options for improving the technical ability of small regional water suppliers to manage systems in remote areas, especially in terms of the expertise on tap, the availability of water data, and planning for drought.

11.Integrated water cycle management

Information request 11

- What steps have been undertaken to address the priority areas for urban water reform identified in 2017?
- Is further guidance on implementing an integrated water cycle management approach for delivering water supply, wastewater and stormwater management services required?
- How does jurisdictional urban water service planning interface with urban land-use planning at different scales? Are the roles and responsibilities clearly set out?
- Is the role of water in delivering amenity and liveability outcomes clear? How are the trade-offs with other NWI outcomes considered? Is it clear how the level and type of amenity delivered by urban water services will be funded?

Integrated Water Cycle Management (IWCM)/Water Sensitive Urban Design (WSUD), and particularly its adequate implementation, is a vexed issue. Indeed many papers, including papers from the Productivity Commission, Water Services Association of Australia, Infrastructure Australia, state and territory water departments, and from water utilities and local government bodies, have been written over the past couple of decades regarding the advantages and disadvantages of IWCM/WSUD implementation.

Engineers Australia recommends continued effort to break down impediments to the implementation of IWCM/WSUD principles, such as cost, data deficits, lack of knowledge and training, lack of coordination, maintenance requirements, institutional issues and inadequate regulation. IWCM focused solutions are a valid part of the solution space and should be carefully considered as part of the evaluation of all available options.

To support holistic assessments of our water cycle futures, focus should be put on clearly articulating water management objectives, be they about liveability, water supply resilience, drought performance, drinking water quality, stormwater management or environmental outcomes and cost effectiveness. When water planning is undertaken in this context, all options for management can be considered and appropriately evaluated against these objectives. This will allow IWCM focused solutions and alternatives to be pursued where appropriate to these objectives. The future measure of success, in this context, will be whether IWCM focused opportunities are being fairly considered, and that schemes are implemented as per the design and maintained appropriately to ensure the designed functionality is monitored and realised.

From the perspective of potential scalability, cost and applicability to existing built environments, one of the more promising large scale IWCM opportunities is the treatment of wastewater and stormwater to produce purified recycled water (PRW). PRW can then be supplied back to water users for various purposes, be it irrigation, industrial or household use. Uses of PRW may depend on levels of community acceptability and cost. Consideration of strategies that allow for the investigation of this option alongside other options is advised.

As discussed in Section 2, there is a distinct lack of good quality stream gauging data at the urban scale. The detailed assessment of IWCM options requires good long-term data series in a range of topographic and development density locations in each of our major cities. Additionally, asset management and water quality data are required to assist in the evaluation of the success of IWCM options.

In terms of urban land use planning, consideration must also be given to the land use planning issues raised in Section 3, including fire water supply, provision of flood mitigation services, and management of source catchment water quality.

In terms of core urban water management objectives, one that has been receiving increasing interest is ‘liveability’, which in relation to climate change includes the use of urban greening and adequate green and blue infrastructure planning and zoning, often with the necessary input of additional irrigation in times of low (or no) rainfall. This is needed to reduce the impacts of ‘heat-island effects’ of large areas of impermeable or non-vegetated land, so that communities and businesses can thrive. Interesting examples of experimentation to reduce temperatures by a few degrees on, for example, Adelaide Airport’s greening program using recycled wastewater[18], could be used to inform urban water requirements under the NWI as climate change impacts in our cities become more visible and acute.

In summary, the principles of WSUD/IWCM are supported, but, as discussed in Section 12, all water engineering options should be evaluated based on their merits, including input from the engineering, environmental, economic, social and

[18] See https://www.sawater.com.au/__data/assets/pdf_file/0005/424724/Adelaide-Airport-Stormwater-Irrigation-Trial.pdf

cultural fields, and considering both short term and long term, direct and indirect, benefits and costs. After implementation a review/s should be undertaken to evaluate the actual benefits and costs of the implemented project, comparing actual benefits and costs to those projected in the project proposal studies.

Recommendation 9 – Engineers Australia supports further efforts to break down identified impediments to the application of Water Sensitive Urban Design/Integrated Water Cycle Management (WSUD/IWCM) principles, and emphasises that all urban water engineering options should be evaluated based on their merits and that actual benefits and costs should be assessed post-implementation.

12.Investment in new water infrastructure

Information request 12

- Are there examples of projects that have not met the NWI criteria for new water infrastructure investment?
- What principles should inform government funding or financing of new water infrastructure?

Australia is a land *of droughts and flooding rains* and thus water infrastructure will continue to be a key area for investment. With the high variability of Australia's climate, the effects of climate change, and our growing population, strategic planning and management of our water resources, rivers, groundwater systems and water-dependent ecosystems is critical to the safety and wellbeing of current and future generations. Long lead times are often required, with secure water supply as a pre-requisite for community, agricultural, urban and industrial development.

As highlighted in the Engineers Australia 2017 submission to the Productivity Commission, some past water infrastructure projects have been built on limited business cases. It is essential that we learn from the past and improve the planning, management and review of water infrastructure investment in the future. Engineers Australia strongly supports the Productivity Commission's intention to assess water infrastructure investment since the 2017 review, including assessment of how water infrastructure projects have demonstrated environmental sustainability and economic viability, and how they have demonstrated their ability to provide for extreme events.

We suggest that the following principles for the review of previous water infrastructure projects and for the evaluation of future projects:

- The design, evaluation and review of water engineering projects requires a professional, multi-disciplinary and team-based approach, including engagement with engineering, environmental, economic, social and cultural experts.
- Both short and long-term, and direct and indirect, benefits and costs should be considered. Major water resources development projects typically return the majority of their benefits distributed across society in the long term, and thus a long-term planning and evaluation horizon is essential.
- Initially, proposals should be supported by effective business cases and impact studies, that include a professional assessment of the direct and indirect, short and long term, engineering, environmental, economic, social and cultural benefits and costs.
- After implementation, a review/s should be undertaken to evaluate the actual benefits and costs of the implemented project, comparing actual benefits and costs to those projected in the project proposal studies. Such reviews should be made public, to allow review by interested parties and to inform the evaluation of future proposals.
- Water resources infrastructure planning should be undertaken in the context that all options should be considered. These may include stormwater harvesting, purified recycled water, IWCM/WSUD, desalination, dams, pipelines, demand management, bores, aquifer storage and recovery, etc.
- Wherever possible, benefits from water infrastructure should be sought across multiple sectors. A water supply dam, for example, may be able to provide flood mitigation, aquaculture, tourism or power generation benefits. An urban stormwater harvesting project could provide amenity and water quality benefits. Greater longer-term gains usually occur from infrastructure that has been holistically designed, rather than just focusing on the latest hot issue.
- Land acquisition is a significant cost for dams, pipelines and water treatment works. Where possible land required for future water infrastructure should be acquired well ahead of time.

- For high security users, such as urban centres, the balance between constructed infrastructure, in place and able to supply, and contingency projects, to be constructed at a particular trigger level during a drought, needs to be considered. Planning allows the balanced evaluation of contingency projects, providing the information needed by water supply managers when the extreme drought arrives.
- The review of planning and performance of water infrastructure for extreme events should include events that are currently in the public consciousness but should also include other extreme events or emergencies which are not front-page news at present. The review of planning and performance of water infrastructure in extreme events and emergencies must include consideration of a wide range of extreme events including fire, flood, drought, cyclone, disease, pollution, earthquake, tsunami, volcanic action, and malicious action, as well as climate, technological and economic change.
- Catchments and aquifers don't always follow state borders, and neither do water users such as population centres or irrigation areas. National guidance and support are required for water infrastructure developments involving cross-border issues.
- There is a critical need to establish foundation data collection networks in areas where development may occur in future. One example might be the development of northern Australia, an area with current low levels of development and limited data collection networks. Stream gauging networks in some northern areas, such as the Northern Territory, have seen substantial reductions in recent decades. The effectiveness and efficiency of future investment in water resources in remote areas of Australia will be vastly enhanced if good quality baseline information is available, hence the recommendation for formal review of water resource data networks in Section 2.

Recommendation 10 – Engineers Australia recommends that all water infrastructure projects should be evaluated based on their merits, including input from the engineering, environmental, economic, social and cultural fields, and considering both short term and long term, and direct and indirect, benefits and costs. After implementation, a review/s should be undertaken to evaluate the actual benefits and costs of the implemented project, comparing actual benefits and costs to those projected in the project proposal studies.

13.Stakeholder working group

It is noted that the Productivity Commission intends to form a stakeholder working group to provide a forum to *exchange information and views on issues relevant to this inquiry.* S89 of the Water Act 2007 (Cth) indicates that the stakeholder working group *is to consist of such persons as the Chair of the Productivity Commission thinks fit who are representative of any: (a) agricultural, environmental, industry, Indigenous or urban water body; or (b) other body with an interest in the referred matter.*

Many of the issues raised in the Issues Paper are complex to address, requiring a high level of technical knowledge and an integrated response. Engineers Australia therefore requests and recommends that a representative of Engineers Australia's National Committee on Water Engineering is invited to serve as part of the Inquiry's stakeholder working group.

Recommendation 11 – Engineers Australia requests and recommends that a representative of Engineers Australia's National Committee on Water Engineering is invited to serve as part of the Inquiry's stakeholder working group.

ENGINEERS
AUSTRALIA