



ARUP

Urban water regulation reform

A REPORT PREPARED FOR INFRASTRUCTURE AUSTRALIA

December 2017

Urban water regulation reform

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Executive summary

Infrastructure Australia (IA) plays a key role in providing advice, and advocating for, reforms to improve the financing, delivery and operation of infrastructure. IA has commissioned Frontier Economics and Arup to prepare this report to inform IA's views on the optimal settings required for economic, environmental and health regulation in the Australian urban water sector, and the opportunities for regulatory improvement.

It is important to recognise that jurisdictions have made significant progress in implementing far-reaching reforms to the economic, environmental and health regulatory frameworks governing urban water over several decades. The National Water Initiative and related measures were key drivers of change, although national approaches to health regulation pre-dated these microeconomic reforms.

The way in which States and Territories have implemented these reforms has also varied considerably, reflecting different views by State Governments on appropriate policy settings and other factors.

In order to assess progress to date and identify what more needs to be done, this report identifies the elements of minimum standard and best practice economic, environmental and public health regulation of the urban water sector. It then assesses the extent to which each jurisdiction meets these standards.

In doing so, we have interpreted 'minimum standards' as being the minimum acceptable regulatory framework to address the objectives of economic, environmental and public health regulation respectively. Most fundamentally this requires that a regulatory framework exists and applies to the urban water sector across each jurisdiction, and is effectively enforced in practice. In contrast, a 'best practice' regulatory framework sets a higher (and evolving) bar—it represents an ideal regulatory framework encompassing all of the features which are considered to reflect current best practice. In this regard, 'best practice' regulation does not necessarily mean a regulatory framework which require the highest possible service standards, if attaining these standards would cost more than the value of the benefits these higher standards would generate for society. Rather best practice regulation should mean more effective and effective regulation that results in more flexible, customer-orientated and lower cost outcomes for the community.

As shown in Figure 1, while many of the jurisdictions are generally achieving key elements of the minimum standard for economic, environmental and public health regulation, there is significant variability within and between the jurisdictions. In addition, while the minimum standards are generally being achieved with respect to environmental regulation, there are some instances where economic and health regulation is not deemed to meet minimum standards—for example, the complete absence of urban retail water price regulation in Queensland and the absence of independent economic regulation in regional urban centres in NSW (i.e. IPART's

remit does not include regulation of regional urban water suppliers) means there are opportunities for improvements to ensure economic regulation in these states meet minimum standards.

As best practice represents a higher bar, fewer regulatory frameworks have been assessed as meeting best practice in most respects. This highlights that even where many regulatory frameworks have improved over time to meet minimum standards, there is considerable scope for further improvement.

Figure 1: Overview of our findings



Source: Frontier Economics and Arup

While recognising that urban water is constitutionally a State responsibility, it is critical to the productivity of cities and an enabler of economic activity, with the structure and performance of economic, environmental and health regulation significantly influencing the performance of the urban water sector and thereby economic activity. For this reason, any national productivity agenda requires the

urban water sector reform to be included, as noted in the recent review of National Competition Policy (the Harper review).

A recommitment to the National Water Initiative (NWI) for reform of the economic, environmental and health regulation of the urban water sector and greater consistency across jurisdictions in no way derogates from the key ongoing roles States will continue to play in water policy and management in their jurisdictions, nor does it necessarily require the additional step of creating a national economic regulator.

The Commonwealth and the States, via the Council of Australian Governments (CoAG), should develop an expanded National Water Initiative (NWI), providing for the medium and longer-term steps necessary to ensure that economic, environmental and health regulation of the urban water sector meets minimum standards and moves towards best practice over time.

This recommitment to urban sector water reform must recognise the critical interaction between economic, environmental and health regulation. Importantly, these different types of regulation should clearly interact when determining the efficient and prudent costs—and ultimately the prices required to recover the costs of service provision. Reform to only one element of the regulatory framework—say economic regulation—without the others risks materially diminishing the benefits in terms of productivity gains that can be achieved in the sector. Value and risk mitigation need to be balanced with effective cross-regulatory frameworks.

1 Introduction

Infrastructure Australia (IA) plays a key role in providing advice, and advocating for, reforms to improve the financing, delivery and operation of infrastructure. In this context, Frontier Economics and Arup are pleased to provide this Final Report to IA on the optimal settings required for economic, environmental and health regulation in the Australian urban water sector, and the opportunities for regulatory improvement.

1.1 Scope of this report

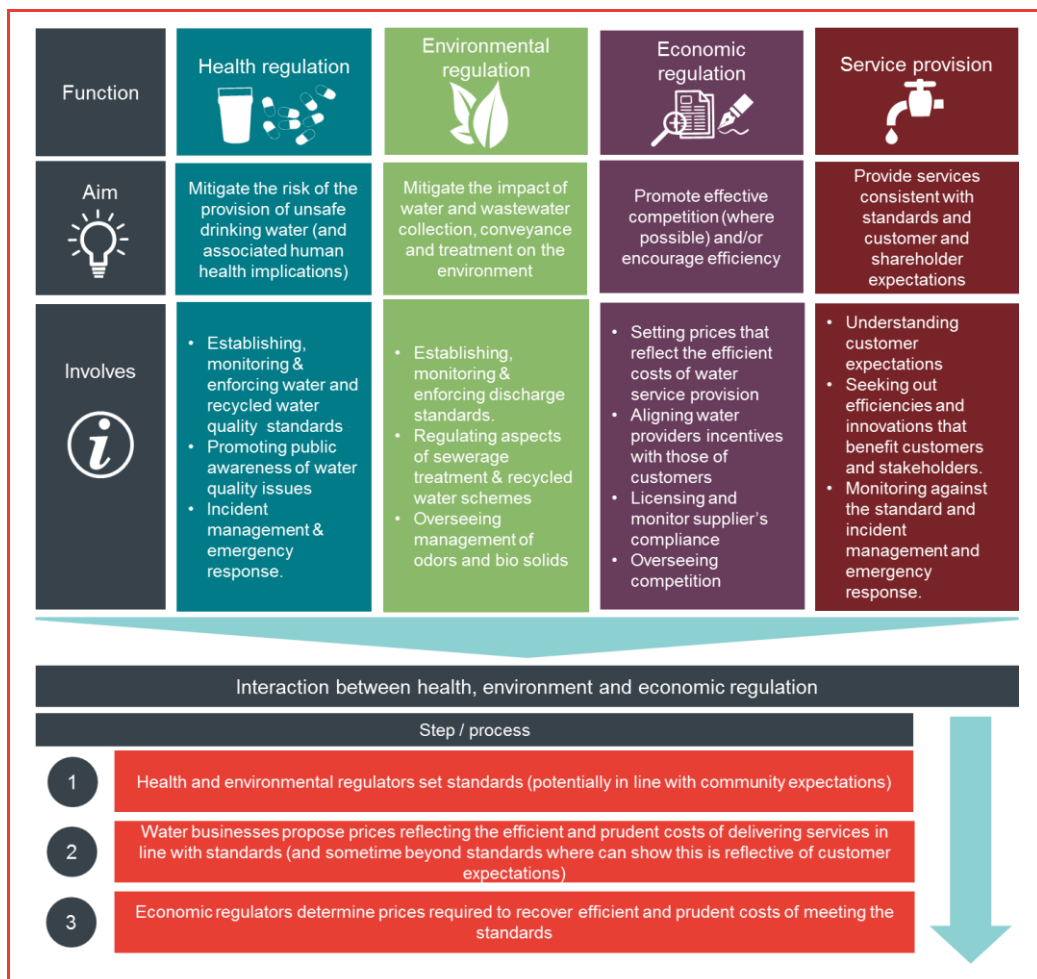
This report covers economic regulation, environmental regulation, and health regulation—and importantly, the interaction between them—as they apply to the urban water sector in Australia. A brief overview of what these types of regulation encompass is provided in Sections 1.2.1 to 1.2.3. Other aspects of urban water regulation (e.g. dam safety) are outside the scope of this report.

1.2 Overview of regulation in the urban water sector

The urban water sector in Australia is responsible for providing water, wastewater, recycled water and stormwater services to a range of diverse customers —although the specific mix of services provided by urban water utilities varies across the states and territories of Australia.

As outlined in Figure 2 and sections 1.2.1 to 1.2.3 each of these services is governed to some extent by state and territory based economic, environmental, and health regulation. Importantly, these different types of regulation interact when determining the efficient and prudent costs — and ultimately when determining the prices required to recover these costs of service provision.

Figure 2: Overview and interaction between economic regulation, environmental regulation, and health regulation



Source: Frontier Economics and Arup

1.2.1 Economic regulation

Economic regulation aims to promote effective competition where this is possible or otherwise to reproduce the disciplines of competition by encouraging efficiency and innovation in service and cost performance over time. This ensures that monopoly businesses do not earn monopoly profits or provide sub-standard services while ensuring that they are able to recover the efficient costs of operating and maintaining their networks.

Well-developed and independent regulatory frameworks will also protect investors and their investments from arbitrary policy making of government and can go some way to providing certainty to investors by addressing regulatory risk (such as government imposed pricing and billing outcomes). A robust regulatory framework provides investors with some surety that they will be able to recoup their investment and earn a normal return.

In the context of utility industries, such as water, economic regulatory functions typically entail:

- Determination or oversight of the prices and service levels provided by monopoly suppliers.
- Licensing of suppliers as a means of monitoring and enforcing compliance with these service levels/prices.
- Overseeing competition in contestable elements of these industries (e.g. via regulation of third party access to essential facilities).

Importantly, the last point above highlights that for the purposes of this report we have interpreted the term ‘economic regulation’ as including regulatory settings designed to promote effective competition in the market (rather than a narrower interpretation of regulation of the prices and services of monopoly suppliers).

We also note that economic pricing has been explicitly excluded from the scope of this report as it is the subject of a separate report commissioned by IA.

1.2.2 Environmental regulation

Urban water services involve several elements, notably: the capture, treatment and delivery of water, the collection, treatment, and disposal of wastewater, and the management of stormwater and flooding.

A number of aspects of these services impact on the environment including:

- The impacts of treated and untreated wastewater discharges on the receiving environment including waterways, groundwater and land from irrigation.
- The impact of diffuse source pollution including stormwater.
- Odour and noise emissions primarily associated with treatment infrastructure, and
- The management of solid and other waste by-products of treatment processes.

Environmental regulation seeks to manage these potential impacts and so typically encompasses:

- Establishing the health of receiving waterways and then determining, monitoring and enforcing associated discharge licence conditions/standards for sewage treatment plants discharging into receiving environments including rivers, oceans, groundwater and land.
- The establishment of guidelines for the management of stormwater.
- Monitoring the management of chemicals used in drinking water, wastewater and recycled water schemes (including transport, receipt, storage and management of hazardous chemicals)

- Establishing and managing an approval processes for infrastructure work which impact on the environment (i.e. treatment plants and recycled water schemes).
- Overseeing the management and monitoring of odours, noise, waste and biosolids emanating from water sector processes.

A growing emphasis on a whole-of-water cycle approach to managing the ultimate impact of the urban water cycle on the environment is occurring with integrated water cycle management program and catchment to tap protection. This can incorporate environmental flow requirements to meet the needs of the environment for biodiversity protection.

1.2.3 Health regulation

The provision of unsafe drinking water for human consumption could have major impacts on public health. There are broadly two groups of health-related aspects associated with drinking water provision:

- Microbiological aspects cover all pathogens, which includes bacteria, viruses and protozoan. Microbial risk in drinking water is identified by the ADWG as being the greatest risk to public health.
- Chemical/physical aspects of drinking water cover all chemicals (including pesticides) that are both man made & naturally occurring.

Drinking water quality regulation seeks to manage these risks in order to protect public health. It typically encompasses:

- Establishing, monitoring and enforcing compliance with drinking water standards.
- Promoting public awareness of drinking water quality issues.
- Defining roles in incident management and emergency response.
- Defining process steps and treatment technologies including their validation and verification.
- Establishing risk management and multiple barrier mitigation for public health protection.
- Encouraging ‘catchment to tap’ responsibilities.

1.2.4 Interaction between different regulations in the urban water sector

As outlined in Figure 2, there is critical interaction between these different regulatory functions. Importantly, these different types of regulation interact when determining the efficient and prudent costs—and ultimately the prices required to recover the costs of service provision.

Economic regulators typically set prices that provide service providers with a reasonable opportunity to recover the efficient and prudent costs of providing urban water services and meeting regulatory obligations.

As noted by the Independent Pricing and Regulatory Tribunal of NSW (IPART)—the economic regulator in NSW—in its Final Report on Sydney Water’s maximum prices for the July 2016-June 2020 period:

We have set prices based on [an]... assessment of the efficient costs Sydney Water will incur in meeting all of its service and performance standards over the 2016 determination period. This includes its environmental obligations and licence requirements, as set by the Environmental Protection Authority (EPA). In meeting its environmental obligations, Sydney Water has undertaken, and plans to continue to undertake, a number of environment-specific projects... We have assessed the reasonableness of Sydney Water’s proposed Environment Protection Licences (EPL) expenditure and the basis upon which it has developed this proposal. We are satisfied that our determination will not negatively affect Sydney Water’s ability to implement these programs.¹

Some economic regulators have expressed concern about the impact of changing community expectations and the potential for ‘inefficient’ environmental and health regulation to unnecessarily inflate the costs of service provision and the prices charged by urban water providers. For example, IPART has used a ‘stick and carrot’ approach by:

- Encouraging service providers to engage “in the regulatory process and work together with the regulator to develop the best possible outcome”² in terms of how environmental or health standards are determined and applied.
- ‘Threatening’ not to allow for the recovery through regulated prices of the prudent and efficient costs of meeting “inefficient regulation”.³ In this regard IPART recently declined to include a mechanism in the 2016 Sydney Water Final Determination to pass through the efficient costs associated with *changes* to regulatory obligations⁴ noting its preference for Sydney Water to be exposed to risk such that it is provided with incentives to ensure

¹ IPART, *Review of prices for Sydney Water Corporation: From 1 July 2016 to 30 June 2020* – Final Report, June 2016, p238-9.

² IPART Submission to the Environment Protection Authority review of Sydney Water Corporation’s environmental protection licences, May 2015, p 5.

³ IPART Submission to the Environment Protection Authority review of Sydney Water Corporation’s environmental protection licences, May 2015, p 5.

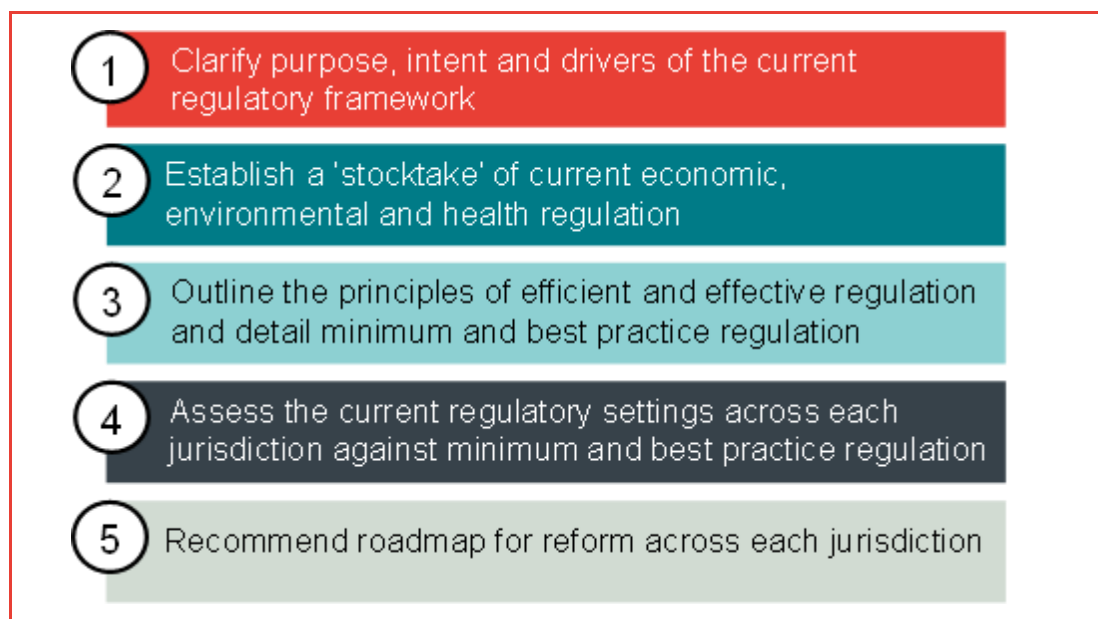
⁴ Despite cost pass through mechanisms for regulatory changes being considered efficient mechanisms for allocating risks between service providers and customers and being part of many regulatory frameworks governing infrastructure sectors.

engage with regulators to “advocate for the most effective and efficient solutions.”⁵

1.3 Our approach to the review

In developing this report our approach has been to undertake five steps as they apply to the urban water sector across Australia as at August 2017 (as outlined in Figure 3). We have not reviewed potential changes to the regulatory framework that have been proposed subsequent to this date—such as proposed changes to the framework for economic regulation in Tasmania.

Figure 3: Our approach to the review



Source: Frontier Economics and Arup

Within each of these steps we have:

- Utilised our knowledge of the urban water sector in Australia and drawn on the framework developed for WSAA and Infrastructure Partnerships Australia on best practice economic regulation.
- Utilised the learnings from the long-history of regulatory reform across the urban water and other sectors in Australia, UK, Europe and North America.
- Drawn on our experience advising:

⁵ IPART, *Review of prices for Sydney Water Corporation: From 1 July 2016 to 30 June 2020* – Final Report, June 2016, p63.

- policymakers, regulators and regulated businesses on the purpose, intent and appropriate structure of regulatory regimes in Australia and overseas; and
- regulated water businesses operating within regulatory regimes in Australia and overseas.
- Drawn on practical frontline experience of developing and operating within the various regulatory regimes operating across Australia.
- Drawn on the views and knowledge of some key stakeholders.
- Sought to detail the key reform opportunities– where possible, supported by a decision-making framework – and the resulting processes and pathways that may be required to implement these reforms.

In our view, this approach will ensure IA is well placed to articulate a broader urban water regulatory reform program.

1.4 Structure of this report

The remainder of this report is structured as follows:

- Section 2 provides a detailed explanation of what past regulatory reforms have been agreed to, and how they inform our current regulatory framework.
- Section 3 provides a detailed exploration and comparison of existing urban water regulatory settings and structures across Australian jurisdictions and a detailed description of how each state and territory developed their regulatory frameworks.
- Section 4 outlines the principles of efficient and effective regulation and defines a set of national minimum standards and best practice regulation for urban water regulation in Australia
- Section 5 compares each state and territories' current regulatory settings against this minimum standard and best practice regulation
- Section 6 outlines the next steps to implementing regulatory reform.

2 What regulation has previously been agreed to?

The first step in our approach is to clarify the purpose, intent and drivers of the current regulatory framework. This involves outlining past regulatory reforms and the intent and drivers behind these reforms. We have focussed on a number of key Australia wide initiatives that have influenced the evolution of the regulatory frameworks.

2.1 The early days: pre-conditions for urban water sector reform

Apart from several unsuccessful early attempts at private provision of water in Melbourne and Perth, the industry has been under the ownership and control of government since its inception with services provided by integrated, publicly owned, water authorities.

Given the emphasis was very much on the development of new infrastructure to meet growing water needs, these works were financed by State Governments with the establishment of large integrated statutory authorities, which had taxing powers. The Melbourne Metropolitan Board of Works (MMBW) in Melbourne and the Metropolitan Water Sewerage and Drainage Board in Sydney were both established in the late 19th century, taking over from the civic authorities. In regional towns, water supplies tended to be provided by local government, although in some States individual town water supplies were subsequently subsumed into the relevant State Government water authorities.

These water utilities typically managed all aspects of the water supply chain from the dams to taps and from sewers to sewerage treatment plants and disposal. These authorities had wide-ranging powers and undertook long-term planning, almost as an arm of government. There was no consultation with customers/stakeholders and little external scrutiny or regulation over their activities. Planning was demand-driven and the prevailing mentality was that the ‘engineers knew best’– to build whatever was required to meet growing public demands. Water supply augmentation was also a highly political issue with many investments following drought events or preceding elections.

There was no independent regulation of prices or service standards, which were not well defined. Reflecting their status as government entities, water authorities typically levied charges to fund their activities in the form of land valuation based rates, with little or no usage charges applying to water volumes used that aligned rates or charges with the cost of provision. There were therefore weak price signals provided to customers or suppliers regarding the cost of consumption or provision of water services.

Given the ‘development’ imperatives of the time, this phase of the urban water industry was undoubtedly successful in managing public health and in providing secure, low-cost supplies for growing urban populations. There were virtually no water quality public health incidents and while there was almost exclusive reliance on inherently variable surface water sources, restrictions were very infrequent because of the significant buffers in-built to the supply system. There was a significant investment in infrastructure assets, such as dams and pipelines, during this period. Population growth and water consumption paralleled each other until the mid-1980s.

However, these outcomes came at a cost. By the mid-1980s there was increasing scrutiny on the cost and service performance of public utilities and a new national competition policy was emerging. There were growing public concerns about the environmental impacts of dam construction, water abstraction, and wastewater disposal, and technologies for treatment of water and wastewater and their impact on the environment were better understood and recognised. This heralded a new era for management of public utilities (including water) in Australia.

2.2 Institutional and regulatory reform of Australia’s urban water sector

The subsequent two decades were characterised by reforms across Australia that focussed on both the efficiency with which public utilities provided their services, and the efficient and sustainable allocation and use of increasingly scarce water resources. Water reforms were, in common with reforms in electricity and gas, driven by the need to improve economic efficiency and service provision. In addition, they were also driven, to a greater degree than other utilities, by the need to improve environmental outcomes. This nationally-driven reform agenda was a key milestone in the evolution of water management in Australia and encapsulated the paradigm shift away from a ‘development’ focus to a ‘sustainable management’ paradigm that emphasised a balancing of economic, social and environmental objectives.

2.2.1 The 1994 Strategic Framework for Water Reform

As part of a broader micro-economic reform agenda, in 1992 the Council of Australian Governments (CoAG) commissioned a report chaired by Sir Eric Neal. The report found that while progress was being made on several fronts, reforms of the water industry were needed.

- Approaches to charging often resulted in commercial and industrial users of water services paying more than the costs of service provision.
- There were major asset refurbishment needs in rural areas for which adequate financial provision had not been made.

- There were impediments to irrigation water being transferred from low value to high value uses.
- There were service delivery inefficiencies.
- There was a lack of clear definition concerning the role and responsibilities of a number of institutions involved in the industry.

Following on from the Neal report, in 1994 the Commonwealth and State Governments agreed to a national water reform package as part of a broader national competition policy (NCP). This integrated package of reforms (see Box 1) included five key elements: cost recovery and pricing reform; institutional reform; water allocation and trade; the environment and water quality; and public consultation.

One of the key elements of the 1994 COAG reforms was that:

...as far as possible, the roles of water resource management, standard setting and regulatory enforcement, and service provision are to be separated institutionally.

As outlined in Section 4.1 of this report, some of the key principles of efficient and effective regulation are clarity on the roles and responsibilities, enhanced transparency and accountability, minimising conflicts of interest (such as where prices are set by the owner/shareholder or service standards set by the supplier), improving regulation by effective and professional regulators, and determining prices transparently and independently.

Independent regulation of other aspects of urban water authorities' activities also developed around this time. In particular, there was more stringent regulation of the environment (e.g. effluent discharges) and public health (drinking water quality).

Box 1: The 1994 Strategic Framework for Water Reform

Cost recovery and pricing reform

- Restructure water tariffs based on the principles of consumption-based pricing, full cost recovery (including a rate of return on assets and pricing of externalities), cross-subsidies between customer classes being reduced or eliminated, and remaining subsidies made transparent
- Introduce two-part tariffs for urban water services consisting of an access fee plus a volumetric fee based on usage (with the volumetric charge reflecting the long run cost to the business of supplying additional units of water, to send appropriate signals to customers to conserve water).

Institutional reform

- An integrated catchment management approach to water resource management
- The roles of resources management, standard-setting and regulatory enforcement and service provision to be separated institutionally
- Deliver water services as efficiently as possible and further develop performance comparisons of service providers seeking to achieve international best practice

What regulation has previously been agreed to?

Final

- Particularly in metropolitan areas, service delivery organisations to have a commercial focus, via contracting out, corporatised entities or privatised bodies
- Water allocation and trade*
- Jurisdiction to implement comprehensive systems of water allocations/entitlements, and separate water property rights from land title
 - Facilitate trading so water is used to maximise its contribution to national income and welfare within the social, physical and ecological constraints of catchments
- The environment and water quality*
- Allocation systems to provide for the environment as a legitimate user of water, so substantial progress on allocations for the environment on stressed or over-allocated rivers required by 1998
- Public consultation and consultation*
- The principle of public consultation by government agencies and service deliverers when change and/or new initiatives are contemplated involving water resources
 - Jurisdictions individually and jointly develop public education programs in relation to water use and the need for, and benefits from, reform
 - Water agencies develop public education programs illustrating the cause and effect relationship between infrastructure performance, standards of service and related costs, with a view to promoting levels of service that represent best value for money to the community

In 1995 the Strategic Framework was incorporated into the National Competition Policy (NCP) reform agenda. Under the NCP agenda, utility industries were being subject to competitive reforms including the disaggregation of integrated monopolies into their monopoly and contestable components. Originally CoAG required the reforms to be substantially complete by 2001. Substantial financial payments from the Commonwealth Government were linked to achievement of the NCP reforms, including water, by the States and Territories.

The development of the NCP agenda was heavily influenced by the 1993 Hilmer report to COAG, which raised significant concerns about the performance and efficiency of government owned utility-based industries (e.g. electricity, gas, water) and the impact of these inefficiencies on overall national productivity. The Hilmer report established general principles for pricing and institutional reform of government-dominated and network monopoly industries to enhance economic efficiency, in addition to a range of other reforms.

2.2.2 Intergovernmental agreement on the environment 1992

In parallel with the national micro-economic reforms affecting the sector, broader national reforms to environmental regulation were also emerging.

In 1992 Commonwealth and the states signed the Intergovernmental Agreement on the Environment (IGA). It clarified the environmental responsibilities between different levels of government; and outlined an agreed set of principles and considerations that would guide the development and implementation of

environmental policy and programs at all levels of Government (see Box 2). These are reflected, with other principles, in the primary environmental protection acts of each state.

Box 2: Principles of Environmental Policy under the Intergovernmental Agreement on the Environment

- The effective integration of economic and environmental considerations in decision-making processes, in order to improve community well-being and to benefit future generations.
- In order to achieve sustainable economic development, there is a need for a country's international competitiveness to be maintained and enhanced in an environmentally sound manner.
- Environmental considerations will be integrated into Government decision making processes at all levels by, among other things:
 - (i) ensuring that environmental issues associated with a proposed project, program or policy will be taken into consideration in the decision making process;
 - (ii) ensuring that there is a proper examination of matters which significantly affect the environment; and
 - (iii) ensuring that measures adopted should be cost effective and not be disproportionate to the significance of the environmental problems being addressed.

In order to promote the above approach, the principles set out below should inform policy making and program implementation.

- Precautionary principle— Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and (ii) an assessment of the risk-weighted consequences of various options.
- Intergenerational equity— the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- Conservation of biological diversity and ecological integrity— conservation of biological diversity and ecological integrity should be a fundamental consideration.
- Improved valuation, pricing and incentive mechanisms—
 - environmental factors should be included in the valuation of assets and services;
 - polluter pays i.e. those who generate pollution and waste should bear the cost of containment, avoidance, or abatement;
 - the users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes;
 - environment goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.

Source: IGA 1992

What regulation has previously been agreed to?

Final

The IGA was ultimately brought into legislation through the Commonwealth *National Environment Protection Council Act 1994* and complementary State and Territory legislation. These Acts created the National Environment Protection Council whose objective was to ensure consistency in environmental protection (including relating to air, water, soil pollution and noise) across Australia, by eliminating differences in the adoption or implementation of major environment protection measures.

2.2.3 National Water Quality Management Strategy

In 1994 the National Water Quality Management Strategy was developed by the Australian and New Zealand Environment and Conservation Council (ANZECC)⁶ and the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) to provide a national, strategic direction for the management of Australia's surface, groundwater and coastal waters. The Strategy's objective is "to achieve sustainable use of the nation's water resources by protecting and enhancing their quality while maintaining economic and social development".

The strategy is based on nationally agreed policies and principles for water quality management. This strategic direction forms the basis for programs to manage water quality in particular catchment areas, while allowing for local conditions and the needs of the local community.

The strategy has also driven the production of a range of guidelines covering key elements of the water cycle. In particular, the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality" (ANZECC Guidelines) establishes water quality indicators and objectives for the protection of a range of environmental values for water resources, such as drinking water, recreation and ecological values.

The ANZECC Guidelines⁷ outline conservative generic trigger values for ambient water quality based on the type and use of a water body. They also suggest more locally specific water quality objectives should be developed.

As discussed further in section 3, the states have adopted different approaches to bringing legislative force to the ANZECC guidelines and developing more locally specific environmental quality objectives for jurisdictional waters.

⁶ The Australian and New Zealand Environment and Conservation Council (ANZECC) is the peak Ministerial Council for inter-governmental consultation and co-ordination on environmental and nature conservation matters.

⁷ Apparently a revised version of the Guidelines is due to be released in July 2017. The main change was the inclusion of updated default guidelines for toxicants.

2.2.4 Drinking Water and Recycled Water Quality Guidelines

Since 1972 the National Health and Medical Research Council (NHMRC) has developed drinking water guidelines, appropriate for local conditions, to ensure that the health of all Australians is not threatened by poor quality drinking water. The Australian Drinking Water Guidelines (ADWG) are updated regularly and combine the results of local and international research with appropriate information from other sources, such as the World Health Organization. Although the ADWG are not legally enforceable in some jurisdictions, they provide recommended guideline values for constituents that affect water quality and safety, which state and territory governments use to set regulatory standards or licence conditions.

In 2006, the risk-based framework of the ADWG was adapted and instituted for recycled water via the Australian Guidelines for Water Recycling (AGWR). The series was introduced steadily over a number of years, further protecting environmental and public health.

2.2.5 The National Water Initiative

Despite the considerable achievements in the decade following the initial COAG Strategic Framework for Water Reform, there was growing recognition that more needed to be done, and that the original CoAG agenda required reinvigoration. This partly reflected the variation in progress between jurisdictions and regions and an increased understanding of the extent of over-allocation in some catchments and the need to return to sustainable levels of extraction while managing the impacts of doing so on water users.

This led to agreement to the National Water Initiative (NWI) in June 2004. The NWI recommitted signatory governments to continue, and in some areas extend, the NCP reforms. The NWI also signalled a greater Commonwealth Government role in water.

The agreed outcomes for urban water reform articulated in the NWI were to:

- Provide healthy, safe and reliable water supplies;
- Increase water use efficiency in domestic and commercial settings;
- Encourage the re-use and recycling of wastewater where cost-effective;
- Facilitate water trading between and within the urban and rural sectors;
- Encourage innovation in water supply sourcing, treatment, storage and discharge; and
- Achieve improved pricing for metropolitan water.

Much of the focus of the NWI is on rural water issues, such as full cost recovery and trading, which represented most of the perceived “unfinished business” from

the CoAG Strategic Framework reforms. In the case of the urban water sector, much of the NWI simply required continuation of the reforms that had already been adopted. Specific NWI urban reform actions include demand management, innovation and capacity building to create water sensitive Australian cities and metropolitan pricing reform. Importantly the NWI included a specific requirement relating to independent economic regulation whereby the parties agreed to use independent bodies to:

- set or review prices, or price setting processes, for water storage and delivery by government water service providers, on a case-by-case basis
- publicly review and report on pricing in government and private water service providers.

As discussed further in section 3, the States have adopted different approaches to implementing these requirements.

2.3 Recent (post NWI) reform initiatives

The dominant influence on subsequent regulatory reform initiatives (post the NWI) was the millennium drought and responses to it.

In January 2007, the Australian Government released “A National Plan for Water Security” (NPWS), which later evolved into the *Water for the Future* program. While this program provided significant funding for urban water security through recycling and stormwater projects, it focused on integrated water management in the Murray-Darling Basin. Key measures included the development of the Basin Plan to set scientifically based sustainable limits on water use; buyback of water for rivers and wetlands from irrigators; and extensive investment in more efficient irrigation systems.

These major changes to water management in the Murray-Darling Basin were subject to several interstate agreements and given effect in the *Commonwealth Water Act (2007)*. The Act built on the earlier reforms and incorporated the overarching objectives of the NWI.

While the focus of these reforms was on rural rather than urban water, the associated regulatory reforms are instructive in considering potential moves to more nationally consistent approaches.

Under the Water Act 2007, the ACCC assumed a role in advising on and administering water charge rules applying to irrigation infrastructure operators in the Murray–Darling Basin across the Basin under a common regulatory framework designed to ensure more consistent pricing practices across water-trading regions. Notably, the Act provided for the ACCC to accredit state regulators to undertake some regulatory functions on its behalf (initially the ESC was accredited while IPART was not).

In relation to irrigation infrastructure operators, the ACCC adopted a three-tiered system of regulation, ranging from greater transparency around pricing in Tier 1 (small member owned operators) to full price determinations for government owned monopoly water businesses in Tier 3 (large infrastructure operators).

Following an independent review of the *Water Act* in 2014 in which consistency of water charging regimes between Basin States was raised by stakeholders as a key concern, the ACCC undertook a review of the Water Charge Rules. The terms of reference for the review included looking at the process for accreditation of Basin States' regulators, the effectiveness in applying water charging regimes by different regulators, and the form and content of charge determinations by all regulators and opportunities for advancing consistent application of the water charging objectives and principles, including options to rank objectives and define terms. One of the outcomes of this review has been the return of regulatory decision-making powers back to state regulators, such as IPART.

As a response to the drought the industry began to move further towards integrated urban water planning approaches which attempt to balance supply and demand options, make use of all potential sources of water and better optimise economic, social and environmental outcomes. This included moves to more decentralised supply and treatment solutions. This requires changes to access and pricing regimes to enable these options to compete on an equal footing (discussed further in section 3). In NSW, the *Water Industry Competition Act (WICA)* was introduced with the stated objective of encouraging new sources of water supply, rather than promoting competition.

In general, however no new agreements were reached relating to urban water regulatory reform beyond those already set out in the NWI. While some jurisdictions made progress towards more fully implementing their NWI commitments, responses to the drought often entailed direct government interventions which undermined previous commitments to separate policy, regulatory and service delivery roles. For example, major urban supply investments worth billions were made directly by governments with little or no scrutiny by economic regulators. Such blurring of institutional roles and responsibilities embedded in the COAG agreement and the NWI can distort and reduce incentives for water businesses to plan and invest efficiently and create expectations that lobbying will be fruitful in the future. It can also create uncertainty and undermine the confidence of private sector investors.

Many reports (e.g. NWC assessments, IA, WSAA/IPA) identified the need for renewed commitment to regulatory and broader institutional reform in the urban water sector. The Harper Competition Review Panel proposed a new national competition body be established to provide leadership and drive implementation of the evolving competition policy agenda. This would include independent monitoring of progress in implementing agreed reforms and publicly reporting on progress. It stated that:

All governments should progress implementation of the principles of the National Water Initiative, with a view to national consistency. Governments should focus on strengthening economic regulation in urban water and creating incentives for increased private participation in the sector through improved pricing practices.

State and territory regulators should collectively develop best practice pricing guidelines for urban water, with the capacity to reflect necessary jurisdictional differences. To ensure consistency, the Australian Council for Competition Policy should oversee this work.

State and territory governments should develop clear timelines for fully implementing the National Water Initiative, once pricing guidelines are developed. The Australian Council for Competition Policy should assist states and territories to do so.

Where water regulation is made national, the responsible body should be the proposed national Access and Pricing Regulator or a suitably accredited state body.

In its response to the Harper Review, the Government supported these recommendations and noted that it was willing to consider payments to states and territories for reforms that improve productivity and lead to economic growth. To date, however, these initiatives have not been adopted.

2.3.1 COAG Environmental Regulatory Practice Principles

Building on the intergovernmental agreement the COAG Standing Council on Environment and Water developed a common set of principles of environmental regulatory practice (see Box 3). These are aimed at pursuing consistent environmental regulation and regulatory practice across jurisdictions.

Box 3: Environmental Regulatory Practice Principles: COAG Standing Council on Environment and Water

The following regulatory principles, released by Council on 11 April 2013, have been developed to guide environmental regulators. The principles provide a useful reference for jurisdictions when developing and applying regulation. They consolidate standard principles for good regulatory development and administration which are common in most, if not all, jurisdictions. The adoption of these principles will:

- assist agencies to develop and apply regulation in an effective and accountable way
- provide certainty to businesses that agencies across Australia will apply similar regulatory approaches in a consistent and transparent regulatory manner.

Through the adoption of these principles, regulatory requirements, policies and standards will be harmonised where possible, with the aim of improving environmental outcomes, making it easier for businesses to comply and reducing administrative burden for both business and government.

Overarching Principles

1. Harmonised regulation: Maximising the opportunities for harmonisation by communicating with other jurisdictions and organisations about regulatory frameworks and adopting and learning from agreed best practice.

2. Strategic and outcome based: Anticipating, finding and solving important regulatory problems in a strategic manner to maximise our regulatory impact and effectiveness.

3. Adaptive and innovative: Using an adaptive and innovative management approach recognises that there is no “one size fits all” response.

- 4. Working collaboratively:** Working together within an organisation and with external stakeholders will deliver better environmental, social and economic outcomes.
- 5. Reviewed and evaluated:** Measuring and reporting our success in undertaking regulatory activities using a broad mix of indicators and quality summaries to encourage others to improve their performance.
- 6. Ethical and Fair:** Behaving ethically and fairly to maintain a proficient and sustainable regulatory system.
- Principles to apply when developing regulation***
- 7. Required:** Establishing the need for government action, ensuring our objectives are clear and targeted; and considering the costs and benefits of a range of options including the simplification, repeal, reform or consolidation of existing regulations.
- 8. Transparent:** Ensuring those interested have the best possible opportunity to participate in the development and review of regulations by providing detailed background and rationale for proposals, a mix of engagement initiatives and the consideration of comments and feedback in an appropriate and timely manner.
- 9. Enforceable:** Ensuring the options for enforcement action are clearly defined, appropriate and linked to achievable objectives.
- Principles to apply when undertaking regulation***
- 10. Risk based and proportional:** Compliance and enforcement actions reflect the level of environmental risk. Responses are targeted, proportional achievable, measurable and cost effective.
- 11. Discretion is applied where appropriate:** Discretion is applied, where appropriate, in a rational and demonstrably justifiable way.
- 12. Decisions and actions are documented:** Accountability for decisions and, actions, considering only relevant facts, supported by adequate documentation, data and information.
- 13. Communicated effectively:** Communication is clear and concise so that all stakeholders are aware of their statutory responsibilities and requirements.

2.3.2 National Review of Environmental Regulation

In April 2014 Environment Ministers agreed to build on existing reform efforts and identify unworkable, contradictory or incompatible regulation and seek opportunities to harmonise and simplify regulations.

Seven thematic areas were identified for assessment of potential reform opportunities which included opportunities for better practice regulation.

The Interim report of the National Review of Environmental Regulation (March 2015) examined trends across jurisdictions towards the adoption of better practice approaches to regulation and identified examples including:

- Adoption of risk-based regulation focussed on proportionate interventions
- Policy harmonisation between jurisdictions
- Removal of regulatory duplication
- Implementation of one-stop shop approaches
- Strategic and landscape scale approaches
- Market-based instruments and other innovative approaches.

What regulation has previously been agreed to?

Final

3 Where are the states and territories up to?

This section provides an overview of how each state and territory developed their regulatory frameworks and the state of play of current economic, environmental and health regulation. In doing so, it provides a high-level comparison of existing urban water regulatory settings and structures across Australia.

Appendix B provides more details on the regulatory arrangements in each State.

3.1 Economic regulation

The NWI requirements for independent economic regulation of urban water suppliers have been largely fulfilled. Urban water providers, supplying large urban areas in Australia, are now overwhelmingly subject to some form of economic regulation of maximum revenues and/or prices that can be levied, with the regulation of service standards and performance managed through the monitoring and enforcement of urban water licences. Figure 4 provides a high-level overview of the frameworks governing economic regulation of the urban water sector in Australia.

Where economic regulators have been given a substantive role in the price determination process—typically when regulating large predominantly State-owned water monopolies—the Government has often set detailed rules or a framework to guide regulators' decisions (see Box 4).

Box 4: Common regulatory framework or guidance provided to economic regulators

In making decisions on revenues and/or prices that can be recovered from customers, regulators typically set revenues and/or prices for a fixed period (or a process to update prices within the period). Businesses are provided with an incentive to pursue efficiency gains by being able to retain (for a period) cost savings over and above that assumed by the regulator (while absorbing any over-runs).

In making these decisions on revenues and prices, economic regulators typically operate within a regulatory framework established by Government that sets out:

- The high-level objectives for the sector that the government directs the regulators to pursue, and the matters to be considered in making decisions (such as the efficiency of the service provider, or the impact of the decision on vulnerable customers).
- The particular services to be regulated, and the nature of regulation to be applied to different services (e.g. CPI-X, compliance with pricing principles etc).
- Regulatory methodologies to be adopted (e.g. CPI-X regulation).
- Initial regulatory asset values.
- Consultation and other processes to be adopted.

Figure 4: Overview of framework governing economic regulation in Australia



Source: Frontier Economics and Arup

However, the approach to implementing economic regulation has varied significantly across the States, reflecting different views by State Governments as to the appropriate coverage, powers and functions assigned to economic regulators and the regulatory approaches and processes which economic regulators should adopt:

- NSW was the first jurisdiction to establish independent economic regulation of its urban water sector, and in fact did so in 1992 prior to the national micro-economic reform initiatives which required this. Rather, the objective was to de-politicise pricing decisions and make pricing more 'rational'. IPART played a key role in overseeing a shift away from property based charges to a user pays system. IPART was given a full range of price determination functions for the urban water sector and recommends licensing guidelines to the Minister. IPART undertakes a detailed public review to determine maximum prices to apply for the major urban water authorities, but does not regulate local government regional urban water suppliers. While an early mover, one consequence is that IPART's governing legislation is now several decades old. However, New South Wales was also the first jurisdiction to implement a state-based access regime to support the emergence of new suppliers and technologies for the provision of water and wastewater services. The Water Industry Competition Act (WICA) establishes an access regime for the storage and transportation of water and sewage using existing significant water and sewerage networks in the areas covered by Sydney and Hunter Water.
- The Victorian Essential Services Commission (ESC) commenced operations as Victoria's independent economic regulator on 1 January 2002, subsuming the Office of the Regulator-General Victoria which had been in operation since 1995. The ESC now regulates all of the state's 19 water businesses and has determinative powers to regulate prices. To date the ESC and water businesses have participated in five separate price reviews. In 2015 the Government commissioned an independent review of economic regulation, governance and efficiency in the Victorian water sector, which proposed far-reaching changes to the current regulatory and governance arrangements for the sector (including relieving the ESC from responsibility for determining prices). While this report was subsequently shelved, it did highlight the need to examine opportunities to enhance the current regulatory and governance frameworks. Following an extensive review in 2015, the ESC adopted a new 'PREMO' incentive model which links the returns earned by a water business to its ambition in relation to proposed service outcomes (informed by customer engagement), the extent to which the ESC concurs with the business's self-assessment, and to how well it delivers on its performance commitments.
- In Queensland, the Queensland Competition Authority Act 1997 established the QCA whose general functions include ensuring competition in respect of government business activities, price monitoring of monopoly services and determining third party access applications. For the urban water sector, the QCA was given an oversight role. Through the prices oversight process, the QCA investigated the pricing practices of declared government monopolies or simply monitored the prices charged by them when directed by the Government. The QCA has undertaken pricing investigations and monitoring on matters referred to it by the Premier or Treasurer since 1999 (e.g. Burdekin

Pricing Review and Gladstone Area Water Board) (QCA 2010). However, the QCA currently has no role in urban retail water. In 2014 it recommended a long-term regulatory framework for SEQ to improve the effectiveness of price monitoring but this has not to date been accepted by the Queensland Government.

- In South Australia, water prices have always been set by Government which has had a long-standing policy of postage stamp pricing for water and sewerage services across the State. ESCOSA was established under the Essential Services Commission Act 2002. Initially the SA Government met the NWI requirement for independent economic regulation by giving ESCOSA a very limited ex post review role rather than ESCOSA undertaking a formal price review itself⁸. In June 2009 the SA Government released the *Water for Good* plan which announced that it would appoint ESCOSA as the independent economic regulator for monopoly suppliers of urban and regional water and wastewater services in South Australia. Its role however remains recommendatory, with final decisions made by the SA Government. ESCOSA has since undertaken several reviews of SA Water's prices. At present ESCOSA determines the maximum amount of revenue SA Water is permitted to earn over each regulatory period for its regulated services (based on its assessment of the efficient costs of SA Water meeting its obligations and service standards). However, individual tariffs to recover this maximum revenue are determined by SA Water consistent with Government policy. A significant recent extension to the regulatory framework was the introduction of a third party access regime which came into effect on 1 July 2016.
- In Western Australia, the ERA Act 2003 provided for the establishment of the ERA with inquiry, reporting, access regulation, licensing and other functions to be administered in respect of utility companies in Western Australia. While the State Government remained responsible for setting the prices paid by households and businesses for water, wastewater and drainage services, the ERA was subsequently assigned the role of reviewing prices and services for the Water Corporation and Busselton and Bunbury authorities under terms of reference on a regular basis. The ERA can undertake an inquiry only at the direction of the Treasurer. When undertaking an inquiry, the ERA recommends water prices to the Treasurer, taking into account the efficient costs of supplying water services. The Government decides whether to accept those recommendations and may implement different prices. The ERA is

⁸ Specifically, a so-called Transparency Statement which documented the South Australian Government's water and wastewater pricing decisions, the processes undertaken and the matters considered by Government in reaching those decisions was prepared. The Transparency Statement was then referred by the Treasurer to ESCOSA, which was required to provide an independent review of the pricing processes and the adequacy of the application of the 1994 CoAG water reform framework. The full Transparency Statement, including ESCOSA's report and the Government's response was published.

currently commencing its fourth major review of Western Australia's three largest water corporations. The ERA also licenses providers of water, wastewater, drainage and irrigation services. This involves issuing licences, monitoring a licensee's compliance with licence conditions, including ensuring they meet standards of water quality and ensuring appropriate customer service mechanisms are in place. The ERA has also provided advice to the Government on a variety of other issues, such as competition in the State's water sector.

- In Tasmania, water and sewerage services in Tasmania have traditionally been provided by many local councils. The Government Price Oversight Commission (GPOC) was the first independent body responsible for conducting pricing investigations on the pricing policies of Government monopoly providers of goods and services. In January 1998 Tasmania's three metropolitan bulk water suppliers were declared monopoly services for the purposes of the Act. The Tasmanian water sector has been subject to major institutional, legislative and regulatory reform in recent years. The main drivers for reform were the non-compliance of many drinking water schemes and wastewater treatment plants and underfunding of capital works more generally. The 2008 Water and Sewerage Industry Act and the Water and Sewerage Corporations Act removed the responsibility for water and sewerage provision from 29 local councils and divested it into three new regionally based corporations, supported by a common services corporation (subsequently amalgamated into a single State-wide business, TasWater). As a key part of this reform, a new water and sewerage regulatory framework was designed and came into effect on 1 July 2009, to be administered by the independent Tasmanian Economic Regulator (OTTER). OTTER's powers include deterministic powers to approve or set prices for TasWater.
- In the ACT, the Independent Competition and Regulatory Commission (ICRC) and its predecessors have been independently regulating water prices since 1997. It has also undertaken the licensing of water utility services and associated compliance functions since 2000.
- In the Northern Territory, the Utilities Commission was initially established to play a regulatory role in the Territory's electricity supply industry market. In 2001 the Commission was also assigned a regulatory role in the water and sewerage industries with the passage of the Water Supply and Sewerage Services Act, but its role in the water and sewerage industry is confined mainly to licensing. The Utilities Commission has no direct role in regulating water prices as water and sewerage service prices are regulated directly by the Regulatory Minister via a Water and Sewerage Pricing Order (WSPO).

Reflecting the different approaches described above, while establishing independent economic regulation was a key requirement under the NWI, the

extent (and quality) of independent economic regulation varies considerably across Australia.

Box 5: Overview of key differences in the application of economic regulation in the urban water sector between Australian jurisdictions

The extent (and quality) of independent economic regulation varies considerably across Australian jurisdictions covering:

- **Governance and pricing functions.** In New South Wales, Victoria, and the ACT, independent economic regulators determine water prices charged by water businesses—that is, they make a binding price determination through an independent price-setting process. In contrast, other jurisdictions (such as South Australia and the Northern Territory) have independent bodies with pricing functions that are largely limited to providing advice to governments (which ultimately sets or approves prices), or reviewing the price setting processes.
- **Guidance provided to the regulatory decision making process.** In NSW and Victoria independent economic regulators determine water prices under standing legislation and do not require a request from the Minister to conduct a pricing investigation. In contrast, QCA, ERA and ICRC rely on the Minister requesting a pricing investigation with the scope of the investigation and discretion provided to the regulator changing through time.
- **Coverage or extent of economic regulation.** Urban water providers in metropolitan areas tend to be regulated by well-resourced and skilled regulators relative to non-metropolitan areas where water services are predominantly provided local councils and regulated by a mixture of state and local government agencies
- **Independent and consultative regulatory decision making processes:** While most jurisdictions encourage and facilitate customer and stakeholder engagement in regulatory decision making, to date Victoria is the only jurisdiction that actively incentivises businesses to offer opportunities for customers and stakeholders to provide input to the proposed prices submitted by the businesses.
- **Broad approaches and methodologies for regulation.** Typically, regulators apply a 'building blocks' methodology whereby the overall revenue requirement is based on key components comprising (efficient) operating expenditure, an appropriate return on assets, and a return of assets (regulatory depreciation). Regulators come to judgements as to what is an efficient revenue requirement to deliver the nominated outputs, based on the regulated business's submission, engineering advice, public input via extensive public consultation processes, and their own analysis. Prices for individual services are then set in a way designed to yield these revenues given forecasts of demand. Generally, prices are set for a fixed period and businesses are provided with an incentive for efficiency by being able to retain (for a period) any cost saving over and above that assumed by the regulator (while absorbing any over-runs).
- **Access regimes.** To date NSW and SA are the only jurisdictions which have implemented a state-based access regime to support the emergence of new suppliers for providing water and wastewater services. However similar reforms are now being contemplated in other jurisdictions.

Source: Frontier Economics and Arup

Section 4 sets out the characteristics of best practice regulation and Section 5 assesses how each of the jurisdictions against these characteristics.

3.2 Environmental regulation

Urban water providers covering large urban areas in Australia are also overwhelmingly subject to some form of environmental regulation reflecting the developments and initiatives outlined in Section 2.2. This is predominantly undertaken by State based environmental protection agencies whose role it is to:

- Issue and monitor compliance with licences — which are typically required for discharging wastewater and other activities. They aim to control the operation of the plant and premises to limit any adverse effect on the direct and surrounding environment. These mechanisms are applied to control the quality of discharge and elements of the operation of water, sewage and recycled water plants. Licences generally have controls associated with water discharge (surface, groundwater), waste discharges, hazardous substances management, air, odour, noise, vibration, traffic, visual & aesthetic and at times to protect biodiversity and heritage & aboriginal values.
- Issue works approvals — that enable constructed type works, plant or equipment to be installed. These must generally be obtained as part of developing a water, sewage or recycled water plant or associated infrastructure.
- Respond to pollution incidents and emergencies — In each state the environmental protection agency's role includes responding to pollution incidents and emergencies. This includes ensuring the responsible person takes appropriate action to minimise the effects of incidents such as sewage overflows from reticulation. Environmental regulation and monitoring also pertains to noise, air, odour and biosolids.

The extent (and quality) of environmental regulation varies considerably between jurisdictions given:

- Specific National Environment Protection Measures (NEPMs) for water quality do not exist. Rather, in each state, environmental water quality guidelines are developed under the frameworks outlined in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council – ANZECC, 2000 prepared as part of Australia's National Water Quality Management Strategy (NWQMS). Instead state-based mechanisms typically applied by the state's EPA form the primary regulation applied to water providers.
- Local government planning controls can also impose environmental requirements on businesses through the planning schemes administered, and permits issued which can restrict land-use under these planning

schemes. The extent (and quality) of these locally imposed controls vary significantly.

Section 4 sets out the characteristics of best practice regulation and Section 5 assesses each of the jurisdictions against these characteristics.

Figure 5: Overview of environmental regulation in Australia



Source: Frontier Economics and Arup

3.3 Health regulation

Regulation of the quality of urban water in Australia is governed by a complex set of regulatory and non-regulatory arrangements which vary state to state. While the states and territories have constitutional responsibility for the management of water resources, requirements for maintaining urban water quality are developed and administered by all three levels of government (Federal, state or territory, and local) as shown in Figure 6.

Some regulatory requirements are longstanding and others relatively new. For example, water recycling guidelines have been introduced recently whereas drinking water guidelines have been in place for many years.

In respect to drinking water quality all states have a Water Act, Public Health Act or Drinking Water Act that references the Australian Drinking Water Guidelines 2011 (ADWG)⁹. These Guidelines provide a framework for the management of water supplies from the catchment to the consumer's tap and set health-related and aesthetic guideline limits for safe drinking water. The ADWG were developed by the National Health and Medical Research Council (NHMRC) and undergo rolling revision to ensure they represent the latest scientific evidence on good quality drinking water. Even though described as 'guidelines', many states and territories make the ADWGs a deemed requirement, however, some are stricter than others and have exceptions.

The relevant Department of Health in each State monitors and regulates the water quality and health issues (in some cases solely and in some cases in partnership with the relevant Department of Water).

Regulation of effluent and recycled water also varies state to state. In some states this is managed by the Department of Health and in some by the EPA. Guidelines vary, but most states refer to the Australian Guidelines for Water Recycling 2006 (AGWR)¹⁰. The AGWR was developed by the Environment Protection and Heritage Council and the Natural Resource Management Ministerial Council. The guidelines incorporate several documents which cover:

- Augmentation of drinking water supplies.
- Stormwater harvesting and reuse
- Managed aquifer recharge.

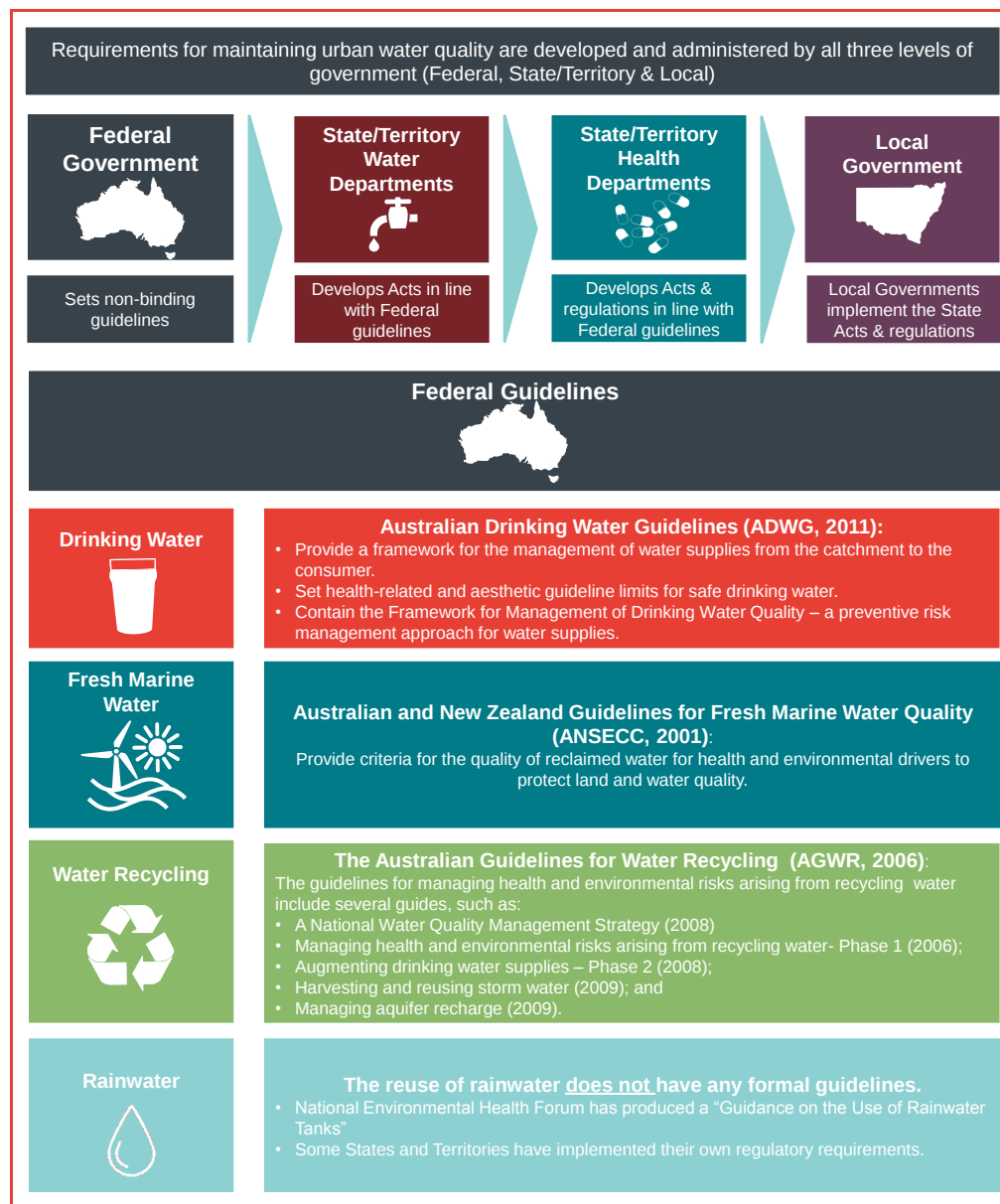
⁹ The ADWG were published in December 2004 with the incorporation of the Framework for Management of Drinking Water Quality - a preventive risk management approach for water supplies. An updated version of the ADWG was released in 2011. The key updates were new microbial indicators, resulting in utilities being required to update tertiary treatment.

¹⁰ The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2001) also provide criteria for the quality of reclaimed water for health and environmental drivers, to protect land and water quality.

Some jurisdictions have implemented the AGWR and have developed specific validation requirements for recycled water schemes, while others are still in the process of implementing them. They are currently inconsistently applied.

The reuse of rainwater does not have any formal guidelines however the National Environmental Health Forum has produced “Guidance on the Use of Rainwater Tanks.” Some States and Territories implement their own regulatory requirements.

Figure 6: Overview of health regulation in Australia



Source: Frontier Economics and Arup

4 What is the minimal and best practice standard for urban water regulation?

This section set out the elements of the minimum standard and best practice economic, environmental and public health regulation of the urban water sector. This includes:

- Outlining the principles of efficient and effective regulation.
- Specifying how these principles may be reflected in the minimum and best practice standard for economic, environmental and public health regulation.

4.1 Principles of efficient and effective regulation

Table 1 sets out principles of efficient and effective regulation. These have been derived from our experience, the literature and recent policy reviews of best practice regulatory regimes.

Table 1: High-level principles/characteristics of efficient and effective regulation

Principle	Implication for regulatory framework
Clarity of objectives/focus	Regulators should have clearly specified and prioritised objectives
Efficiency/cost-effectiveness	- Regulatory interventions should be proportionate and cost-effective to ensure that the benefits from regulation outweigh the costs - Compliance costs should be minimised through avoiding delays and excessive information requirements and undertaking regulatory reviews in a timely manner - Unnecessary duplication between regulators should be eliminated
Consistency/predictability	- The framework for regulation should provide a stable and objective environment (e.g. well-defined decision making criteria and clear timetables) enabling all those affected to anticipate the context for future decisions and to make long-term investment decisions with confidence - Ensure consistency of treatment of participants across service sectors, over time and across jurisdictions
Accountability	Roles and responsibilities between Government and economic regulators should be allocated in such a way as to ensure that regulatory decisions are taken by the body that has the legitimacy, expertise and capability to arbitrate between the required trade-offs

	Regulatory decisions should be subject to appropriate scrutiny and challenge including effective appeal mechanisms
Transparency	- Decision-making powers of regulators should be exercised transparently (e.g. reasons for decisions clearly articulated and publicly available) and with procedural fairness - Explain rules about the treatment of confidential information
Adaptability/flexibility	- The framework of regulation needs can evolve to respond to changing circumstances and continue to be relevant and effective over time - Where possible use a goals-based approach, giving businesses flexibility to decide how best to achieve clear targets
Independence	- The regulator should ideally be free of conflicting objectives and independent of both the policy processes of government and stakeholders and the operational activities of businesses - Ensure regulatory decisions are free from undue influences that could compromise regulatory outcomes
Capability	Ensure regulators have appropriate expertise and resources to effectively undertake their functions
Coherence	- Regulatory frameworks should form a logical part of the Government's broader policy context, consistent with established priorities - Regulatory frameworks should enable cross-sector delivery of policy goals where appropriate

4.2 Defining minimum standard and best practice regulation

Drawing on the principles set out in Table 1, this section establishes minimum standard and best practice economic, environmental and public health regulation as it applies to the urban water sector.

4.2.1 Our approach to establishing these standards

We have interpreted 'minimum standards' as being the minimum acceptable regulatory framework to address the objectives of economic, health and environmental regulation respectively (as opposed to the level of minimum standards – such as water quality standards – themselves). Most fundamentally this requires that a regulatory framework exists and applies to the urban water sector across each jurisdiction, and is effectively enforced in practice. However, a

What is the minimal and best practice standard for urban water regulation?

Final

‘minimum standard’ framework requires more than just the existence of a regulatory framework, but also that it possesses defined characteristics which in our view represent the minimum acceptable features of an effective regulatory framework.

In contrast, a ‘best practice’ regulatory framework sets a higher bar – it represents an ideal regulatory framework encompassing all the features which are considered to reflect current best practice.

Our approach to defining minimum standard and best practice regulation is to use a consistent framework for economic, environmental and public health regulation, is summarised in Box 6.

Box 6: Our approach to defining minimum standard and best practice regulation

There are several elements of regulation that will influence the efficiency and effectiveness of regulation and the performance and outcomes of the urban water sector. Some of these elements will be within regulators’ control (say regulatory decision-making processes), while others may be outside their control (say, governance arrangements).

Our approach to defining minimum standard and best practice regulation is to use a consistent framework for economic, environmental and public health regulation covering:

- **Governance arrangements**—including regulatory objectives and principles; institutional form, structure and organisational capacity; powers and functions (including extent of jurisdiction) and review and appeals mechanisms. These matters are typically defined in legislation and subsidiary instruments.
- **Approaches, methodologies and instruments for regulation**—including use of traditional and alternative approaches and forms of regulation and associated instruments such as incentive and risk sharing mechanisms and compliance monitoring and enforcement.
- **Regulatory decision-making processes**—including processes for setting prices/standards, stakeholder engagement and interaction between regulators.

Source: Source: Frontier Economics and Arup

The precise nature of each of these elements of a regulatory framework will determine the extent to which it achieves the principles of efficient and effective regulation as set out in Table 1 above. While a ‘minimum standard’ framework encompasses a basic level of independence, accountability and transparency, it may not necessarily achieve the regulatory outcomes in the most flexible and efficient manner. A ‘best practice’ framework with some additional or differently defined features is more likely to achieve the principles in an effective and efficient manner.

As summarised in Figure 7, in broad terms, the key differences between minimum standard and best practice regulation reflects the extent to which regulation:

- Achieves outcomes at least cost (e.g. by adopting risk-based and outcomes-focused rather than prescriptive approaches, recognising the costs associated with regulation).

- Provides incentives to improve outcomes over time (with outcomes aligning to customer preferences and expectations).
- Is flexible to efficiently and effectively manage emerging challenges and developments (e.g. integrated water cycle management) in the sector, rather than being tied to previous paradigms around industry structure and traditional service delivery models.
- Is transparent – both in expectations (what is required) and regulatory decision-making (how decisions have been made) – and consultative.

Ultimately these differences mean that best practice regulation should mean more efficient and effective regulation that results in more flexible, customer-orientated and lower cost outcomes for the community. In recent years, economic regulators have placed increasing emphasis on the importance of businesses genuinely engaging with customers in developing their regulatory proposals.

In this regard, ‘best practice’ regulation does not necessarily mean a regulatory framework which require the highest possible service standards, if attaining these standards would cost more than the value of the benefits these higher standards would generate for society.

Appendix A provides a more detailed specification of minimal standards and best practice urban water regulation. Many of the elements of ‘best practice’ regulation are in addition to those in the minimum standards¹¹, however, this is not always the case.

¹¹ For example, the minimum standard for review and appeals mechanisms as part of the governance arrangements is for judicial review of decision-making. The best practice standard is for independent merits review in addition to judicial review.

Figure 7: Broad differences between minimum standard and best practice regulation of the urban water sector



Source: Frontier Economics and Arup

5 Assessment of whether states and territories conform to standards

This section assesses the current regulatory settings across each jurisdiction against the minimum standard and best practice economic, environmental and public health regulation as defined in Section 4 and Appendix B.

5.1 Our approach to assessing the jurisdictions

Our first step in assessing the jurisdictions against the national minimum standard and best practice (as defined in Section 4 and Appendix B) was to do this at granular level by considering each element within the respective:

- Governance arrangements¹².
- Approaches and methodologies for regulation and associated instruments.
- Regulatory decision making processes.

This detailed granular assessment is set out in Appendix B.

Our second step was to aggregate this assessment, as set out in Sections 5.2 and 5.3, into a set of ‘traffic light’ indicators. For the purposes of this report, we have adopted a set of ‘traffic light’ indicators which provide an overall assessment as follows:

- **Green** – where the regulatory framework meets the *vast majority* of the elements for minimum or best practice standards.
- **Amber** – where the regulatory framework meets *many* of the elements of minimum or best practice standards, but does not meet some important elements.
- **Red** – where the regulatory framework does not meet many of the elements of minimum or best practice standards (including where there are major gaps in coverage or application of the standards across the relevant jurisdiction).

In aggregating the assessment across each element of minimum and best practice standards, we have not weighted these elements in a deterministic or prescriptive manner. As such there are elements of subjectivity in these assessments. However, we consider the ‘traffic light’ indicators play a useful role in highlighting key areas where urgent improvements are needed to the regulatory frameworks for urban water.

¹² For example, the regulatory objectives and principles; institutional form, structure and organisational capacity; powers and functions etc.

5.2 Assessment of the jurisdictions against minimum standards

5.2.1 Overview

This section summarises our assessment of each of the jurisdictions against the minimum standards for economic, environmental and public health regulation set out in Section 4.

As shown in Table 2, while many of the jurisdictions are generally achieving key elements of the minimum standard for economic, environmental and public health regulation, there is some variability within and between the jurisdictions—particularly in relation to economic regulation.

Table 2: Assessment of jurisdictions against minimum standards of economic, environmental and public health regulation of the urban water sector

	Economic regulation	Environmental regulation	Public health regulation
NSW	Metro  Regional 		
Victoria			
Queensland			
South Australia			
Western Australia			
Tasmania			
Australian Capital Territory			
Northern Territory			

Source: Frontier Economics and Arup

While the minimum standards are generally being achieved with respect to environmental regulation, there are some instances where economic and health regulation is not deemed to meet minimum standards—for example, the complete

absence of urban retail water price regulation in Queensland and the absence of independent economic regulation in the Northern Territory and in regional urban centres in NSW (i.e. IPART's remit does not include regulation of regional urban water suppliers) means there are opportunities for improvements to ensure economic regulation in these states meet minimum standards.

5.2.2 Economic regulation

As indicated in Table 2, most states are meeting most or many of the key elements of minimum standard economic regulation, including independent economic regulation by appropriately resourced independent agencies subject to objectives enshrined in legislation.

The most fully independent and comprehensive regimes apply in Victoria and Tasmania, reflected in a rating of meeting the vast majority of the requirements for minimum standard economic regulation across the jurisdictions. Where coverage is incomplete (e.g. regional urban businesses are not subject to independent economic regulation as outlined in Box 7), and where regulators are not fully independent (i.e. regulators' decisions are recommendatory only – see Box 8), we have assessed the jurisdictions as not achieving the highest rating. In addition, in some jurisdictions, unclear or conflicting remits are given to regulators, and inadequate rights of review apply to regulatory decisions.

Box 7: Economic regulation of urban water providers in metropolitan vs non-metropolitan areas

The extent or coverage (and resulting quality) of economic regulation varies considerably across Australia—particularly in smaller regional areas—where water services are predominantly provided and regulated by local councils. For example, in NSW, the Regulator determines prices for declared monopoly services including the metropolitan businesses (such as Sydney Water), bulk water services provided by State Water and water planning and management charges, but not for local water utilities in non-metropolitan areas where water services are predominantly provided and regulated by local councils. There is also limited effective price regulation and oversight in regional Queensland where local councils still provide water services. In contrast, the economic regulator in Victoria (the Essential Services Commission) determines prices for all metropolitan, regional and rural water services.

The costs of inadequacies in price setting and institutional arrangements are beginning to be recognised, but a key lesson from reform experience in other places is that the costs of underinvestment and poor service quality are unlikely to be fully understood until reform begins and transparency increases. For example, the 2008 Inquiry into secure and sustainable urban water supply and sewerage services for non-metropolitan NSW recommended improving the economic regulation of the 105 non-metropolitan local water utilities in NSW (none of which are regulated by IPART as monopoly service providers) by:

- Strengthening regulatory management: Strengthen the regulation of local water utilities to require implementation of all relevant plans, guidelines and standards, including the designation of a regulator with adequate enforcement powers.
- Improving pricing regulation: The regulation of local water utilities' pricing should be strengthened to require utilities to establish prices in accordance with approved business

plans and financial plans. Local water utility prices must be approved by an independent body.¹³

Source: Frontier Economics and Arup

Box 8: Independent economic regulation to resolve any conflicts between ownership of and setting prices for urban water businesses

As the ACT's economic regulator for utility services, the ICRC's role includes setting the maximum prices that may be charged by ACTEW for the provision of water and sewerage services. In 2013 the ICRC undertook a price review of prices charged by ACTEW (now Icon Water). The price review process was strongly contested and was the subject of an ACT Auditor-Generals' review, which found that:

"There are conflicts in the roles of the Treasurer in the setting of water and sewerage prices in the ACT. The Treasurer is a voting shareholder of ACTEW and is also the Minister responsible for water and sewerage price setting policy. As part of the 2013 water and sewerage price setting process, the Treasurer set the terms of reference for the investigation and provided submissions to the ICRC on behalf of the ACT Government. While there are practices that mitigate the risk of adverse effects due to conflicts in roles, such conflicts remain. Given the importance of the roles it would be prudent to further mitigate (and if possible) eliminate the conflicts in roles."

In similar terms, the 2013 Queensland Commission of Audit observed that:

"There has been a tendency for governments to use price regulation as a mechanism to protect consumers from 'price shocks', where prices or price increases are considered to be excessive. This type of government intervention may provide some temporary or short-term price relief for consumers.

However, it creates regulatory uncertainty and inconsistency for existing and potential industry participants, which can discourage investment. Over time, it is unsustainable to have a situation in which prices do not reflect the actual cost to deliver services."

In the past, the QCA monitored water prices in south east Queensland (SEQ) to assess whether households and businesses are paying a price that is comparable with the costs of providing the relevant services, but the QCA did not set or recommend prices. However, the QCA currently has no role in urban retail water.

The National Water Commission has observed that in Western Australia the independent economic regulator's assessments are advisory only, with government making pricing decisions. It noted that it is likely that such decisions, when taken by governments, will consider matters relevant to their multiple roles, potentially distorting pricing decisions.

Source: ACT Auditor-Generals' report, Adelaide Advertiser, Queensland Commission of Audit 2013, National Water Commission (2014), <http://www.qca.org.au/Water> (July 2017).

5.2.3 Environmental regulation

As indicated in Table 2, all states and territories are assessed as meeting most or many of the key elements of minimum standard environmental regulation, including independent regulation by appropriately resourced and independent agencies subject to objectives enshrined in legislation. Environmental regulation

¹³ Report of the Independent Inquiry into Secure and Sustainable Urban Water Supply and Sewerage Services for Non-Metropolitan NSW, December 2008.

has been in place for some time due to the governments' and communities' drives towards environmental protection for many decades. This holds true for the water sector, however integrated regulation and mitigation of conflicts with other forms of regulation remains difficult in each jurisdiction.

5.2.4 Health regulation

As outlined in Table 2, most states are assessed as meeting the key elements of minimum standard health regulation, generally through appropriately resourced independent agencies which are subject to objectives provided for in legislation. The ADWG and AGWR are generally strongly legislated or represent a deemed required in most jurisdictions, although implementation can be limited for smaller scale, deemed lower risk schemes, and in some rural/regional settings.

There is concern in rural remote areas, particularly indigenous communities, that minimum health standards are not implemented, even if required in regulations.

Health regulation is more strongly defined and regulated for drinking water as compared to recycled water, with some jurisdictions not necessarily requiring through regulation that the AGWR be complied with. In these jurisdictions, they are still used as a reference and guidance document.

For Western Australia and the Northern Territory there is a lesser regulatory regime associated with recycled water. There is an MOU between Water Corporation and the WA Department of Health addressing drinking water. The implementation of the ADWG and AGWR for smaller and remote communities is an ongoing difficulty.

5.3 Assessment of the jurisdictions against best practice

5.3.1 Overview

This section assesses each of the jurisdictions against best practice economic, environmental and public health regulation as set out in Section 4.

As best practice represents a higher bar, fewer regulatory frameworks have been assessed as meeting best practice in most respects. This highlights that even where regulatory frameworks meet minimum standards, there is considerable scope for further improvement.

Table 3: Assessment of jurisdictions against best practice economic, environmental and public health regulation of the urban water sector

	Economic regulation	Environmental regulation	Public health regulation
NSW			
Victoria			
Queensland			
South Australia			
Western Australia			
Tasmania			
Australian Capital Territory			
Northern Territory			

Source: Frontier Economics and Arup

5.3.2 Economic regulation

This report generally confirms the findings of a report commissioned by WSAA in 2014 which found that the current arrangements for economic regulation of the urban water industry in Australia have some significant shortcomings when compared to best practice. While there is minimal private sector investment in the urban water sector, these fundamental problems have the potential to dampen incentives for innovation and investment in typically long-lived infrastructure assets.

One notable exception is Victoria, which we have assessed as meeting most of the conditions for best practice economic regulation, with the main shortcoming being that it does not yet have a third party access regime in place.

While NSW is achieving many of elements of best practice economic regulation in metropolitan urban areas (i.e. utilities within IPART's remit), there are opportunities to move towards best practice through reviewing the legislation governing the regulators to ensure it remains fit for purpose, improving

accountability in decision-making through merits review, greater use of incentive mechanisms to encourage service and cost improvements valued by customers and use of efficient risk-sharing mechanisms. There are also significant opportunities to implement many of the findings from the 2008 Inquiry (see Box 7) to ensure a robust framework of independent economic regulation applies to the (now) 92 non-metropolitan local water utilities in NSW (none of which are regulated by IPART as monopoly service providers).

There are also significant opportunities in Queensland, South Australia, Western Australia, Tasmania, the Northern Territory and the ACT to bring aspects of their economic regulation towards best practice. In particular, some frameworks do not include:

- Best practice customer-led consultation processes.
- Clearly prioritised legislative objectives to guide regulatory decision-making.
- The use of service and cost improvements valued by customers and use of efficient risk-sharing mechanisms.
- Merits review frameworks, limiting accounting ability to judicial review only (only Victoria and the ACT have merits review processes).
- Formal access regimes to provide a formal framework for competition as part of their economic regulatory frameworks (only NSW and SA have access regimes).

5.3.3 Environmental regulation

Table 3 indicates that most jurisdictions are deemed to meet environmental best practice regulation at times or in part but none do so fully. Some core elements to this assessment include the widespread lack of risk-based environmental determination and monitoring and non-use of offsets and other mechanisms to drive environmental objectives. Compliance to predetermined parameter-based points in time and space are commonplace. Regulators do not regularly consult or seek feedback on costs and efficiencies nor engage with stakeholders openly and transparently to the degree expected by today's community.

Few jurisdictions have adopted load-based or other similar licensing as representing offsets or catchment wide environmental outcomes. There is little integration with economic and health regulation and little effort to determine value and effort for environmental risk mitigation. Cross-parameter determination is also highly limited, where for instance, improvements in nutrient generation may be mitigated but at a high cost for energy use, waste generation and greenhouse gas production.

For the Northern Territory, environmental regulation is assessed as being below that for best practice most notably due to the lack of holistic determination and powers, with distribution apparent across Acts, Departments and Ministers. It is

not clear that all appropriate environmental parameters are subject to compliance aspects including environmental impacting activities.

5.3.4 Health regulation

Table 3 indicates that most jurisdictions are deemed to meet public health regulation best practice at times or in part, with no jurisdiction fully achieving best practice. A limiting aspect of note is the lack of full and complete legislative adoption of the ADWG and AGWR which together enable the protection of health and the environment through a risk-based framework across most of the urban water cycle. Whilst the ADWG are almost universally legislated, the implementation clauses mean that smaller communities, smaller scale and other exemptions can apply. Some jurisdictions also do not independently audit compliance, nor to a similar and complete standard. This is particularly true for elements 5 and 9 being verification and validation respectively.

Health regulation is often not under the remit of the Health Department and Health Minister, as is the case for the Northern Territory and Western Australia, although an MOU does exist between the West Australian Health Department and the Water Corporation. In many jurisdictions, the funding and resourcing commitment to urban water is not apparent within the relevant Health Department, which is required to meet a very broad and large remit (such as hospitals, mental health, swimming pools, workplace, well-being to name a few).

In most jurisdictions, not all schemes and entities associated with the urban water cycle are covered by the remit of the Health Department and health regulation. Independent audit by qualified and independent auditors is not always required.

In the case of Western Australia and the Northern Territory, compliance and adoption of the AGWR is not prevalent. In most other jurisdictions, uptake of the AGWR is highly variable in implementation.

5.3.5 Interaction between regulatory frameworks

Best practice in each category of economic, environmental and health regulation is an appropriate objective. An advanced outcome would be to achieve a high level of interactive and integrated, risk-based, value-outcome regulation that aspires to mitigate cost and maximise outcomes. This requires an advanced level of coordination across regulatory frameworks, regulatory bodies, regulators, industries and levels of government.

There is no jurisdiction that achieves a strong sense of integrated regulation across economic, environment and health. The closest might be IPART in NSW where economic pricing, environmental and health outcomes, via operational licences for water utilities is mandated against the ADWG and AGWR. IPART then coordinates findings and outcomes with the state environment and health agencies through a referral mechanism, although misalignment can still occur.

6 What are the recommended steps to reform?

The fifth and last step in our approach is to set out the recommended roadmap or pathway for reform.

6.1 The case for action

Like many other infrastructure services water is constitutionally a State responsibility and trade in urban water does not occur on a large scale across state borders. This has led some policymakers at the Commonwealth and state level to suggest that urban water reform should be left to individual jurisdictions.¹⁴

However urban water is a nationally significant industry: it is critical to the productivity of cities and an enabler of economic activity, with the structure and performance of economic, environmental and health regulation significantly influencing the performance of the urban water sector and thereby economic activity. For this reason, any national productivity agenda requires the urban water sector reform to be included, as noted in the recent review of National Competition Policy (the Harper review).

It is also unlikely that in urban water an ad hoc approach will deliver the necessary reforms. There are a range of practical considerations that mean there is a valuable role for a collaborative national approach to reform. Previous water reforms were underpinned by national coordination. The 1994 COAG water reform framework and concurrent competition reforms prompted substantial institutional change. The Commonwealth recognised that securing the benefits of micro-economic reform extended to reform of areas of state responsibility. It also recognised that all governments should share in the benefits of reform. Fiscal incentives were provided to the states to undertake reform. This rationale for Commonwealth leadership is as valid now as it was in the previous reform era.

A recommitment to the National Water Initiative (NWI) for reform of the economic, environmental and health regulation of the urban water sector and greater consistency across jurisdictions in no way derogates from the key ongoing roles States will continue to play in water policy and management in their jurisdictions, nor does it necessarily require the additional step of creating a national economic regulator.

The Commonwealth and the States, via the Council of Australian Governments (CoAG), should develop an expanded National Water Initiative (NWI), medium

¹⁴ Further, some see an advantage of state-based reform as providing for maximum policy experimentation, and a form of competitive federalism.

and longer-term steps necessary to ensure that economic, environmental and health regulation of the urban water sector meets minimum standards and moves towards best practice over time.

This recommitment to urban sector water reform must recognise the critical interaction between economic, environmental and health regulation. Importantly, these different types of regulation interact when determining the efficient and prudent costs—and ultimately the prices required to recover the costs of service provision. Reform to only one element of the regulatory framework—say economic regulation—without the others risks materially diminishing the benefits in terms of productivity gains that can be achieved in the sector.

The core elements underpinning an expanded NWI covering economic, environmental and health regulation reform are set out below.

6.2 Economic regulation: Recommended steps to reform

The urban water component of a new NWI should be framed around the following pillars:

- The enhanced NWI should set out national minimum standards for efficient economic regulation in urban water, for adoption by states and territories. As a minimum, the standards should require jurisdictions to put in place independent economic regulation of the urban water sector through appropriately resourced and funded independent agencies subject to objectives enshrined in legislation. This is critical for:
 - Overcoming the potential conflicts which can arise where Governments are responsible for or have ultimate control over setting prices charged by the monopoly water businesses which they own.
 - Promoting certainty and investment in the urban water sector.
 - Encouraging efficient cost recovery in water prices.
 - Incentivising efficient water use.
- The enhanced NWI should set a ‘stretch target’ for efficient economic regulation in urban water, for adoption by states and territories. This target would be updated through time as circumstances change (including the role of urban water providers in the community) and best practice economic regulation evolves and learnings can be taken from new and innovative regulatory models (including from overseas). This could include best practice standards that require:

- Fully independent regulation subject to clearly articulated and prioritised objectives enshrined in legislation, including an overall objective for regulators to act in the long-term interests of customers.
- Comprehensive coverage of economic regulation across all regions in a jurisdiction (even if the precise form of regulation may appropriately differ).
- Incentive mechanisms to improve outcomes over time (with outcomes aligning to customer preferences and expectations).
- A test of financial viability to ensure water businesses can meet the efficient costs of operating and maintaining their networks and hence protect the long-term interests of customers.
- Embedding innovative customer and stakeholder engagement.
- Merit review and appeal mechanisms for water businesses and other stakeholders.
- A clear framework for competition.
- Financial payments to the States should be linked to meeting each of the standards including the coverage or extent of economic regulation across the state given the significant discrepancy between regulatory arrangements in major urban water centres and regional centres.

6.3 Environmental regulation: Recommended steps to reform

The urban water component of a new NWI should be framed around the following pillars:

- The enhanced NWI should require adoption of the AGWR in full and for all schemes and aspects of the urban water cycle.
- Environmental aspects need to move away from point source and single parameter and towards catchment/load-based/multi-source and multi-parameter, supported by strong data analytics and machine learning technology.
- Environmental regulation needs to be applied across the full urban water cycle including catchments, stormwater, flooding and diffuse sources.
- The NWI should consider environmental outcomes holistically – such as determining best overall environmental outcome across aspects (e.g. nutrient reduction, energy efficiency, water and resource recovery, waste minimisation and gas emissions).

- The NWI should require environmental outcomes to be generated for catchments and environments that serve broad objectives.
- The NWI should require the fast track use of digital and data analytics to observe and monitor environmental outcomes, mitigated risk and best value costing's. This can seek to limit the burden costs. New technology can also be used and deployed for 3D and 5D modelling, real-time decision making and adaptation of performance to meet the environmental conditions (e.g. adapting to drought/fire/flood).
- Load-based licensing and other offset mechanisms should be explored and required for most parameters, and enable cross-catchment, cross-border and cross-entity development of best for catchment outcomes.
- The NWI should better enable inter-district environmental assessment and review including mandatory feedback and stakeholder engagement. Independent audit and compliance frameworks and schemes should sit nationally to assist and support inter-district learning and consistency.
- The NWI should consider market based offset and other schemes to promote best overall outcomes for the environment (including health and economic regulation).
- The NWI should adopt parameters and approaches that systemise the sustainable development goals being positively impacted by the urban water sector.

6.4 Health regulation: Recommended steps to reform

The urban water component of a new NWI should be framed around the following pillars:

- The enhanced NWI should require adoption of the ADWG and the AGWR in full, for all schemes and all aspects of the urban water cycle.
- Health regulation should be a key and core well-resourced component of the respective Health Departments in each jurisdiction, enabling cross-fertilisation of knowledge and monitoring outcomes.
- The NWI should enable national registers of data including performance outcomes for technology being validated and verified. The NWI should require the fast track use of digital and data analytics to observe and monitor health outcomes, mitigated risk and best value costs. New technology can also be used and deployed for Bayesian modelling, real-time decision support and adaptation of performance to meet the given local conditions (for example, adapting to epidemiology events).
- The NWI should require regulators to have implicit and deterministic powers associated with health outcomes across the full water cycle including

stormwater, catchments, flooding, drinking water, recycled water and all other sources and forms.

- The NWI should enable and empower independent certification and compliance auditing at a national level. Incentive based regulation should be supported to particularly improve the outcomes for small, rural, regional and remote communities.
- The NWI should demand and require indigenous communities, small remote and rural regional settings to be resourced sufficiently and appropriately over the long term to achieve the same standards and levels of service and health outcomes as the major urban centres in Australia.
- The NWI should adopt parameters and approaches that systemise the sustainable development goals being positively impacted by the urban water sector.
- The NWI should seek to deploy legislation instruments that are flexible to meet the changing technology approaches available, whilst maintaining health outcomes.
- The NWI should mandate water plans for all schemes, regardless of size, location and aspect of the water cycle.
- The enhanced NWI should put customers at the heart of the legislated outcomes, for all communities.
- The NWI should require ongoing and persistent review of legislation, frameworks, data, monitoring, performance and outcomes to ensure best value outcomes.

Appendix A: Detailed specification of minimal standard and best practice urban water regulation

This section provides detail on the minimum standard and best practice economic, environmental and public health regulation of the urban water sector.

Economic regulation

Governance arrangements

Table 4 sets out a set of minimum standard and best practice governance arrangements as they apply to economic regulation of the urban water sector.

Table 4: Economic regulation: Governance arrangements

Area	Minimum standard	Best practice
Regulatory objectives and principles	Regulatory objectives and principles are clearly specified and as far as possible, are non-conflicting.	- Regulatory objectives and principles are clearly specified in legislation or regulation and as far as possible, are non-conflicting. Where objectives are potentially conflicting, there should be some formal direction to guide the regulator in how to make trade-offs between objectives. Give primacy to the long-term interests of customers and efficient investment. - Legislation and regulation is reviewed periodically (consistent with better regulation guidelines) to ensure they remain fit for purpose

Area	Minimum standard	Best practice
		Government provides a clear policy framework for competition in the water sector.
Institutional form, structure and organisational capacity	- The economic regulator should have a separate board (commission/tribunal) for decision making - The economic regulator should have adequate resourcing and staffing levels including staff trained in economics	- The economic regulator should be an independent body clearly at arms-length from government, should be governed under its own Act and report to a Minister not responsible for the sectors they are regulating - The economic regulator should have a separate board (commission/tribunal) for decision making - The economic regulator should have adequate resourcing and staffing levels including staff trained in economics
Powers and functions	Economic regulators should have powers to regulate activities which are supplied under conditions of market power but decisions on the scope of the regulator's jurisdiction should be made by policymakers (i.e. government). Regulator should not determine scope of its powers/ authority (such as 'where to regulate' or coverage) consistent with 'separation of powers' principle.	- Economic regulators should have deterministic powers rather than being a recommendatory body - Economic regulators should have powers to regulate activities which are supplied under conditions of market power but decisions on the scope of the regulator's jurisdiction should be made by policymakers (i.e. government). - Regulator should not determine scope of its powers/ authority (such as 'where to regulate' or coverage) consistent with 'separation of powers' principle. - The jurisdiction of the economic regulator should be sufficiently broad to allow for comprehensive and consistent regulation of the services being provided. - Clearly defined powers and functions necessary to undertake their role and achieve the regulatory objectives should be set out in legislation and should typically include:

Area	Minimum standard	Best practice
		□ determination or oversight of the prices and service levels provided by monopoly suppliers □ licensing of suppliers as a means of monitoring and enforcing compliance with these service levels/prices □ overseeing competition in contestable elements of these industries (e.g. via regulation of third party access to essential facilities).
Review and appeals mechanisms	• Judicial review in considering whether a decision was unlawfully made	• Independent merits review (based on a re-hearing) on clearly specified grounds should be available to both businesses and customers • The appeal body should be independent from the regulator and government and be drawn from a panel of experts when required
Congruence with broader government policy	• There should be regular reviews of the economic regulatory framework itself.	• All regulators should be explicitly empowered and required to cooperate with other bodies where this will assist in meeting their common objectives • There should be regular reviews of the economic regulatory framework itself.

Broad approaches, methodologies and instruments of regulation

Table 5 sets out a set of minimum standard and best practice approaches, methodologies and instruments of regulation as they apply to economic regulation of the urban water sector.

Table 5: Economic regulation: Broad approaches, methodologies and instruments

Area	Minimum standard	Best practice
Approaches and forms of regulation	• Economic regulators should ensure forms of regulation provide opportunity to recover the efficient cost of service provision • Forecasts of the efficient cost of service provision should make use of best available information (including 'revealed costs')	• Economic regulators should apply a financeability test as a sense check on proposed prices. • Well integrated use of robust benchmarking to complement bottom-up cost forecasts of the efficient cost of service provision
Alternative approaches and forms of regulation	• Economic regulators periodically seek feedback on and review their broad approaches to regulation with a view to identifying ways to improving it, and in particular to: □ minimise the level of prescription wherever possible (utilising a risk based assessment) □ minimise the regulatory burden by ensuring benefits of regulation outweigh the costs □ look to incorporate learnings from other industries/sectors and move towards best practice over time • Economic regulations should consider where regulation of revenues/prices and/or service	• The framework within which the economic regulator operates should not preclude the adoption of alternative approaches to regulation which are most likely to achieve the regulatory objectives and incentivise innovation and new ways of promoting customers' long-term interests • Economic regulators should look to innovative: □ Risk/cost sharing mechanisms (such as Thames Tideway Tunnel use of risk sharing to lower cost of capital) that allocate risk efficiency and lower costs/prices □ Approaches to setting 'funding costs' ('trailing average' debt costs) □ Means of addressing cost recovery risk, ensure financeability and promote smoother price paths such as 'flexible depreciation'

Area	Minimum standard	Best practice
	outcomes can be governed by alternative approaches – □ Lighter handed forms of regulation incl. weighted average price caps. □ Greater role for/reliance on competition	□ Use of total expenditure (totex) in cost assessment to provide more balanced incentives
Form of price control	• Economic regulators apply appropriate and well-defined forms of price control are applied to meet the relevant circumstances (with a strong case for revenue caps where there is significant uncertainty over demand)	• Businesses should be given scope to propose appropriate and well-defined forms of price control consistent with the promotion of efficiency and other regulatory, commercial and customer interests.
Regulation of tariff structure	• Economic regulators should set tariff structures that seek to promote efficiency as well as balance other regulatory, commercial and customer interests.	• Economic regulators should take a light-handed approach that allows businesses the flexibility to design tariff structures consistent with the promotion of efficiency and other regulatory, commercial and customer interests.
Incentive and risk sharing mechanisms	• Economic regulators should promote efficient risk/cost sharing between water providers and customers (i.e. risks/costs are allocated to parties best able to manage the risk) including through well-defined cost pass through mechanisms for uncontrollable and unanticipated events (such as regulatory and/or taxation change events).	• Clearly specified incentive mechanisms that promote symmetrical ('stick and carrot') and continuous/ongoing incentives for cost/service improvements over the regulatory period. • Businesses should be given scope to propose incentive mechanisms where they reflect customer expectations for cost/service improvements • Economic regulators should look to innovative risk/cost sharing mechanisms that allocate risk efficiency and lower costs/prices (such as Thames Tideway Tunnel use of risk sharing to lower cost of capital)

Area	Minimum standard	Best practice
Operating licences	- Clearly specifies the obligations and performance targets imposed on the business - Is subject to periodic review	- Clearly specifies the obligations and performance targets imposed on the business, adopts a risk-based approach. - Is subject to periodic review
Compliance monitoring and enforcement	Monthly and annual monitoring and reporting mechanisms.	Monitoring frameworks should: - Seek to limit the burden on businesses by being consistent with existing reporting requirements, adopting a risk based approach, and allowing for some degree of self-review and audit. - Be subject to periodic review to ensure suitability to changes in circumstance and to try and minimise burdens on businesses Enforcement frameworks should: - Be simple and easily understood and enforced consistently in a predictable and non-discriminatory manner through decision making processes and decisions which are transparent to the both businesses and customers - Be proportional — use a risk-based approach as far as possible.

Regulatory decision making processes

Table 6 sets out a set of minimum standard and best practice decision-making processes as they apply to economic regulation of the urban water sector.

Table 6: Economic regulation: Decision making processes

Area	Minimum standard	Best practice
Price review and other decision making processes	- The economic regulator should undertake a transparent process including clear specification of the rationale underlying any regulatory decisions - Economic regulators should propose and consult on draft decisions.	- Regulators should periodically provide guidance on how they have interpreted any legislative/regulatory guidance, how they have made trade-offs and how these trade-offs best promote the objectives (i.e. long term interests of customers) - The regulatory process should show consideration for cost-effectiveness, including cost reporting by the regulator. - Economic regulators should utilise approve/reject (or 'propose – respond') framework - Economic regulators should take risk-based assessments of these proposals/business plans - The level of consultation undertaken during the review process should be adequate and inclusive
Setting service standards	- Service standards should be clearly specified/well defined, measurable, and meaningful - Changes in customer service standards overseen by economic regulators should be subject to willingness to pay assessments	- Service standards should be clearly specified/well defined, measurable, and meaningful - Changes in customer service standards overseen by economic regulators should be subject to willingness to pay assessments (i.e. reflect customer or community expectations) - Regulators or agencies making decisions on standards to apply to water and related services should fully comply with RIS requirements.

Area	Minimum standard	Best practice
Stakeholder engagement	Regulators should seek and offer opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums etc.).	- Procedures and mechanisms for engagement with regulated entities and other stakeholders should be institutionalised as consistent transparent practices - Economic regulators should clearly articulate their expectations for water businesses' consultation in developing their pricing submissions. - Economic regulators should encourage businesses to take ownership of prices and their customer engagement.
Interaction between regulators	Recognition of interaction between different regulator's decision-making	- Formalised and transparent procedures for consultation between economic regulators and regulators responsible for other matters including protection of the environment, public health, and safety - Recognition from other regulators of the regulatory cycle (regulatory periods and price reviews)

Environmental regulation

Governance arrangements

Table 7 sets out a set of minimum standard and best practice governance arrangements as they apply to environmental regulation of the urban water sector.

Table 7: Environmental regulation: Governance arrangements

Area	Minimum standard	Best practice
Regulatory objectives and principles	Regulatory objectives and principles are clearly specified in environmental act and as far as possible, are non-conflicting	- Clearly specified in legislation or regulation and as far as possible, are non-conflicting. Where objectives are potentially conflicting, there should be some formal direction to guide the regulator in how to make trade-offs between objectives. - These objectives that: - Can be applied to the entire urban water cycle including point and diffuse source pollution, stormwater, flooding - Include supporting more resource, carbon and energy efficiency including objectives around greenhouse gas emissions - Encourage long term decision making - Enable outcomes based regulation that is risk based and proportionate. i.e. take account of the economic, social and environmental costs and benefits of pollution abatement - Principles and objectives developed in broader collaboration with affected stakeholders

Area	Minimum standard	Best practice
Institutional form, structure and organisational capacity	- The regulator should be a body under the relevant environment department, should be governed under its own Act and report to a Minister - The environmental regulator should understand the legislative objectives - The environmental regulator should have adequate resources and funding to drive the necessary change	- The environmental regulator should be an independent body at arms-length from government, should be governed under its own Act and report to a Minister not responsible for the sectors they are regulating - The environmental regulator should have a strong mission where core mission and specified legislative objectives are well known within the organisation. - The environmental regulator should have adequate resources and funding to drive the necessary change - Ability to effectively track the regulator's current ability and capacity relative to regulatory needs - Clearly defined powers and functions necessary to undertake their role and achieve the regulatory objectives should be set out in legislation.
Powers and functions	- Regulators to provide recommendations to environment and related relevant government departments - The regulatory staff should understand specific legislative objectives - Ability for regulatory staff to ensure legislation is applied to all water service providers with no exceptions	- Regulators should have deterministic powers rather than being a recommending body - The regulatory staff should understand mission and specific legislative objectives - Ability to support incentive and outcome based regulation as opposed to command based legislation - Actively collaborates with relevant water bodies to help achieve desired outcomes in a collaborative manner - Ability and resources to be flexible and creative in problem solving
Review and appeals mechanisms	Review by environment department to be undertaken on clearly specified grounds should be available to water service providers and shared across jurisdictions to enable consistency and lessons	- Independent merits review (based on a re-hearing) on clearly specified grounds should be available to both businesses and customers - The appeal body should be independent from the regulator and government and be drawn from a panel of experts when required

Area	Minimum standard	Best practice
Congruence with broader government policy	Regulators have been shown to cooperate with other bodies where required	- All regulators should be explicitly empowered and required to cooperate with other bodies with a clear documented process for feeding into other regulatory processes where this will assist in meeting their common objectives - There should be regular reviews of the environmental regulatory framework itself.

Broad approaches, methodologies and instruments of regulation

Table 8 sets out a set of minimum standard and best practice approaches, methodologies and instruments of regulation as they apply to environmental regulation of the urban water sector.

Table 8: Environmental regulation: Broad approaches, methodologies and instruments

Area	Minimum standard	Best practice
Alternative approaches and forms of regulation	Definition and control approach to implementation of regulation where penalties are applied	- The framework within which the environmental regulator operates should enable the adoption of risk and market based approaches to regulation which are most likely to achieve the regulatory objectives - Environmental regulators periodically seek feedback on and review their broad approaches to regulation with a view to identifying ways to improving it, and in particular to: - minimise the level of prescription wherever possible and support an incentive based regulation approach - minimise the regulatory burden by ensuring benefits of regulation outweigh the costs - ensure that the regulatory framework is flexible enough to take account of local context - encourage whole of life-cycle thinking and an integrated approach to water management - Compliance and enforcement is targeted to preventing non-compliances – seek to be more proactive than reactive.
Issuing licences and permits	Setting explicit licence conditions for point source discharges	Clearly specifies the obligations and performance targets imposed on the business,

Area	Minimum standard	Best practice
	Load based licensing for pollutants of concern	- adopts a risk-based approach to setting conditions which transparently takes into account the full range of costs and benefits of pollution abatement which setting licence conditions - licences subject to periodic review - offset and market based arrangements enabled where feasible
Setting Catchment or waterway water quality and environmental health objectives	Regional objectives or jurisdictional water quality based plans prepared	- Develop localised objectives based on classifying water bodies by beneficial use (e.g. recreational use, protection of the aquatic ecology etc.) and which outline relevant parameters for testing water quality - Objectives are sufficiently clear so that they can be monitored through a set of appropriate indicators. - Objective recognised/referenced in other enforceable environmental control laws or policies
Incentive and market based mechanisms	Load based licensing of some form	- Adoption of market based instruments including offset schemes, effects based licencing and load based regulatory mechanisms or trading schemes to achieve environmental outcomes more cost effectively - Other financial incentives, such as charges, levies or reverse auctions used to generate creative solutions to achieving environmental outcomes
Compliance monitoring and enforcement	- Monthly and annual monitoring and reporting mechanisms. - These are centrally database managed and can be interrogated.	Monitoring frameworks: - Seek to limit the burden on businesses by being consistent with existing reporting requirements, adopting a risk based approach, and allowing for some degree of self-review and audit. - subject to periodic review to ensure suitability to changes in circumstance and to try and minimise burdens on businesses

Area	Minimum standard	Best practice
		Enforcement frameworks should: • Be simple and easily understood and enforced consistently in a predictable and non-discriminatory manner through decision making processes and decisions which are transparent to the both businesses and customers • Be proportional — use a risk-based approach as far as possible.

Regulatory decision making processes

Table 9 sets out a set of minimum standard and best practice decision-making processes as they apply to environmental regulation of the urban water sector.

Table 9: Environmental regulation: Decision making processes

Area	Minimum standard	Best practice
Understanding ambient environmental conditions	• Bi-annual surveillance of health of catchments and waterways and development of index of waterway condition • Monitoring of noise, air, odour and other environmental attributes where appropriate.	• Comprehensive process for monitoring health of waterways including index or rating system at the sub-catchment level that is reported on annually • Management intervention monitoring is required to evaluate the expected changes that can be attributed to the delivery of management activities and regulation
Environmental Modelling of waterways and catchments	• Potential availability of 1D / 2D models. • Centralised databases to which licensed entities and activities submit data.	• Develop up to date 2D/3D waterway and catchment models that have been well calibrated to understand behaviour of system which is used in developing licence conditions and support decision making processes • Development of real-time systems to manage water quality non-compliance and support action and decision making (e.g. Recreational waters in Copenhagen) • Development of robust decision making tools to understand how system might respond to certain environmental changes and to identify future vulnerabilities and develop appropriate actions
Monitoring compliance	• Annual reporting and reporting monthly via electronic databases and submissions.	• Proactively monitor compliance and seek to understand patterns of non-compliance.

Area	Minimum standard	Best practice
	Compliance auditing.	- Independent auditor by panel of accredited auditors. - Data analytics applied to database to note and advise trends and outcomes.
Stakeholder engagement	- Procedures and mechanisms for engagement with regulated entities and other stakeholders should be undertaken on an as needs basis - Encourage increased transparency	- Procedures and mechanisms for engagement with regulated entities and other stakeholders should be institutionalised as consistent transparent practices - Encourage increased transparency, sharing of data and public involvement - Engage with public to make clear what regulator is trying to accomplish (the why, how, progress on objectives and what adjustments are being made to better achieve objectives) - Be proactive in giving horizontal guidance to industry to allow facilitate change and help deliver on objectives in a collaborative manner.
Interaction between regulators	Informal and ad hoc procedures for consultation regulators responsible for other matters such as health	- Effective documented processes for integrating environmental, health and economic regulation - Help communicate objectives and support the development of objectives that are consistent between agencies

Health regulation

Governance arrangements

Table 10 sets out a set of minimum standard and best practice governance arrangements as they apply to health regulation of the urban water sector.

Table 10: Health regulation: Governance arrangements

Area	Minimum standard	Best practice
Regulatory objectives and principles	The Australian Drinking Water Guidelines and the Australian Guidelines for Water Recycling referred to in legislation	- The Australian Drinking Water Guidelines and the Australian Guidelines for Water Recycling to be clearly specified in legislation and not conflict with other guidelines - Guidelines applied to all providers with no exceptions - Give primacy to the long-term interests of customers - Planning practices aligned with early involvement of utilities
Institutional form, structure and organisational capacity	- The health regulator should be a body under the relevant health department, should be governed under its own Act and report to a Minister - The health regulator should understand the legislative objectives - The health regulator should have adequate resources and funding to drive the necessary change	- The health regulator should be a body under the relevant health department, should be governed under its own Act and report to a Minister - The health regulator should have a strong mission where core mission and specified legislative objectives are well known. - The health regulator should have adequate resources and funding to drive the necessary change - Ability to effectively track the regulator's current ability and capacity relative to regulatory need

Area	Minimum standard	Best practice
Powers and functions	The regulatory staff should understand specific legislative objectives	- Regulators should have deterministic powers rather than being a recommendatory body - The regulatory staff should understand mission and specific legislative objectives - Ability for regulatory staff to ensure legislation is applied to all water service providers with no exceptions - Ability to support incentive based regulation as opposed to command based legislation - Involvement of utilities and water providers from early stages to support the incentive based regulation
Congruence with broader government policy	All regulators to cooperate with other bodies where required	- All regulators should be explicitly empowered and required to cooperate with other bodies where this will assist in meeting their common objectives - There should be regular reviews of the health regulatory framework itself.

Broad approaches, methodologies and instruments of regulation

Table 11 sets out a set of minimum standard and best practice approaches, methodologies and instruments of regulation as they apply to health regulation of the urban water sector.

Table 11: Health: Broad approaches, methodologies and instruments

Area	Minimum standard	Best practice
Alternative approaches and forms of regulation	- The framework should not preclude the adoption of alternative approaches to regulation which are most likely to achieve the regulatory objectives. Noting that water quality health regulation will require a level of prescription due to the level of consequence - Health regulators seek feedback on an ad hoc basis to review their broad approaches to regulation with a view to identifying ways to improve it	- The framework within which the health regulator operates should not preclude the adoption of alternative approaches to regulation which are most likely to achieve the regulatory objectives. Noting that water quality health regulation will require a level of prescription due to the level of consequence - Health regulators regularly seek feedback on and review their broad approaches to regulation with a view to identifying ways to improving it, and in particular to: - minimise the regulatory burden by ensuring benefits of regulation outweigh the costs - ensure that the regulatory framework is flexible enough to take account of local context
Water quality plans	Water quality plans prepared and send to regulator on a jurisdiction basis	- All water service providers (licensees) to ensure a water quality plan is prepared and sent to the regulator, meeting national standards, specifying: - if the water so supplied is drinking water, how the 12 elements of the framework for the management of drinking water quality, as detailed in the Australian Drinking Water Guidelines, have been addressed and will be implemented, and

		□ if the water so supplied is non-potable water, how the 12 elements of the framework for the management of recycled water quality and use, as detailed in the Australian Guidelines for Water Recycling, have been addressed and will be implemented and, having regard to those guidelines, the purposes for which the water may be used and the purpose for which the water may not be used. • A water quality plan in relation to water infrastructure for drinking water must be consistent with the Australian Drinking Water Guidelines. • A water quality plan in relation to water infrastructure for non-potable water must be consistent with the Australian Guidelines for Water Recycling. • If required by the regulator, or if any significant change is made to its water quality plan, the licensee must provide the regulator with a report, prepared by an approved auditor
Incentive and risk sharing mechanisms	• Not currently deployed	• Clearly specified incentive mechanisms based on observable/measurable outcomes that provide for increased service standards • Clearly specified and appropriately defined re-opening mechanisms for unanticipated events
Operating licences	• Clearly specifies the obligations and performance targets imposed on the water service providers, adopts a risk-based approach, and is subject to annual review	• Clearly specifies the obligations and performance targets imposed on the water service providers, adopts a risk-based approach, and is subject to annual review • The licensee: □ must ensure that its water quality plan is fully implemented and kept under regular review and, in particular, that all of its activities are carried out in accordance with that plan, and

		□ if the regulator directs, amend its water quality plan in accordance with direction provided
Compliance monitoring and enforcement	Monitoring frameworks should: • Existing reporting requirements • Involve audits as per the regulators discretion • Be subject to ad hoc review to ensure suitability to changes in circumstance Enforcement frameworks should: • Be simple and easily understood	Monitoring frameworks should: • Seek to limit the burden on water service providers by being consistent with existing reporting requirements, adopting a risk based approach, and allowing for some degree of self-review • Involve audits at clearly specified intervals by approved auditors selected by relevant regulatory bodies under specific audit guidelines • Be subject to periodic review to ensure suitability to changes in circumstance and to try and minimise burdens on water service suppliers Enforcement frameworks should: • Be simple and easily understood and enforced consistently in a predictable and non-discriminatory manner through decision making processes and decisions which are transparent • Be proportional — use a risk-based approach as far as possible.

Regulatory decision making processes

Table 12 sets out a set of minimum standard and best practice decision-making processes as they apply to health regulation of the urban water sector.

Table 12: Health regulation: Decision making processes

Area	Minimum standard	Best practice
Regulatory review and other decision making processes	- The health regulator should adopt an appropriate decision making framework - The health regulator should undertake a transparent process including clear specification of the rationale underlying any regulatory decisions - Health regulators should be involved in draft decisions.	- The regulatory process should show highest consideration for water quality - The level of consultation undertaken during the review process should be adequate and inclusive - The health regulator should undertake a transparent process including clear specification of the rationale underlying any regulatory decisions - Health regulators should propose and consult on draft decisions.
Setting service standards	Service standards should mention the ADWG and AGWR	- Service standards should clearly legislate the ADWG and AGWR and be well defined, measurable, and meaningful - Service standards to reduce duplication of effort for both regulators and industry - Regulators or agencies making decisions on standards to apply to water and related services should fully comply with ADWG and AGWR requirements. - Jurisdictions to implement a two-tiered regulatory system based on exposure scenario

Area	Minimum standard	Best practice
		• A national approach to the validation of treatment processes for low risk and high risk schemes
Stakeholder engagement	• Procedures and mechanisms for engagement with regulated entities and other stakeholders should be undertaken on an as needs basis • Encourage increased transparency	• Procedures and mechanisms for engagement with regulated entities and other stakeholders should be institutionalised as consistent transparent practices • Encourage increased transparency, sharing of data and public involvement • Health regulators should clearly articulate their expectations for water businesses' consultation in reviewing water quality standards • Stakeholders to be engaged at an early stage of reviews and planning practices to ensure any new processes are implemented from an early stage • Training to be undertaken for water suppliers for the implementation of the AGWR and the ADWG
Interaction between regulators	• Informal and ad hoc procedures for consultation between health regulators and regulators responsible for other matters including protection of the environment, economics, and safety	• Formalised and transparent procedures for consultation between health regulators and regulators responsible for other matters including protection of the environment, economics, and safety • Recognition from other regulators of the regulatory cycle (regulatory periods and price reviews)

Appendix B: Detailed assessment of the jurisdictions against minimum standards and best practice regulation

This section provides a detailed assessment each of the jurisdictions against the minimum standards and best practice economic, environmental and public health of the urban water sector, as set out in Section 4 and Appendix A.

New South Wales

Table 13: Assessment of economic, environmental and public health regulation of the urban water sector in NSW

	Current state of play	Assessment against minimum standards & best practice regulation
<i>Economic regulation</i>		
<i>Governance arrangements</i>	- IPART is an independent regulator with powers to determine prices for the urban water sector (under the <i>Independent Pricing and Regulatory Tribunal Act 1992</i> (IPART Act)) and can recommend licensing guidelines to the Minister. - Minister can issue Pricing Orders and can direct IPART (with the Premier's approval) under section 16A of the IPART Act to include the efficient costs of complying with the specified requirement in prices. <i>The Water Industry Competition Act</i> (WICA) establishes an access regime for the storage and transportation of water and sewage using	- Clearly meets minimum standards for governance but falls short of best practice as: - Coverage limited to major urban suppliers - IPART Act has not been reviewed periodically in line with better regulation guidelines - Although IPART must consider and balance a broad range of matters when determining prices, matters for IPART's consideration under the IPART Act can be conflicting, with no formal direction to guide the regulator in how to make trade-offs between objectives

	Current state of play	Assessment against minimum standards & best practice regulation
	existing significant water and sewerage networks in the areas covered by Sydney and Hunter Water. • IPART must consider and balance a broad range of matters when determining prices. • IPART's remit does not include regional urban water suppliers • Judicial review of decision-making is available; however, merits review of decision-making is not available	○ Does not provide for merits review.
<i>Regulatory decision making processes</i>	• Regulator undertakes a detailed, transparent public review (including clear specification of the rationale underlying any regulatory decisions)—with opportunities for external consultation to determine maximum prices and operating licences to apply for the major urban water authorities. • Regulator recognises interaction between different regulator's decision-making	• Clearly meets minimum standards for transparency but has not yet adopted best practice consultation techniques emerging elsewhere
<i>Instruments or form of regulation</i>	• Regulator typically ensures forms of regulation provide opportunity to recover the efficient cost of service provision (however see risk sharing point under 'instruments of regulation') • Regulator typically uses incentive form of economic regulation • Regulator typically utilises prescriptive approach to price setting with minimal use of light-handed regulatory frameworks (such as weighted average price cap) where appropriate - continued regulation of all tariffs and all segments of the supply chain in the	• Clearly meets minimum standards for regulatory approaches and methodologies • While the regulator has discretion to implement a range of regulatory options—including forms of price control, tariff structures, incentive mechanisms: ○ There is limited investigation of alternative risk-sharing mechanisms that may be more efficient in managing risk and offer lower cost/prices for customers.

	Current state of play	Assessment against minimum standards & best practice regulation
	presence of competition can increase the scope and impacts of regulatory error. Regulator makes some use of standard risk-sharing mechanisms such as cost pass through to manage uncontrollable and unforeseen cost changes (such as changes in regulatory and/or taxation events)	- There is limited use of clearly specified incentive mechanisms based on observable/measurable outcomes that provide for increased service standards - Limited use of robust benchmarking to complement bottom-up cost forecasts
Environmental regulation		
Governance arrangements	- The EPA is an independent regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objective and provide recommendations to the Minister on licence approvals, operating under its own Act/s. Key Acts include: <i>Protection of the Environment Administration Act 1991</i> (NSW) – establishes the EPA, the Board of the EPA (including Chairperson), two community consultation forums, and the NSW Council on Environmental Education and requires the EPA to make a report on the state of the environment every three years. The overriding objective of the EPA is to protect, restore and enhance the quality of the environment in NSW, having regard to the need to maintain ecologically sustainable development. <i>Environmentally Hazardous Chemicals Act 1985</i> (NSW) - sets up the Hazardous Chemicals Advisory Committee who advises the EPA on the assessment and control of chemicals that are environmentally hazardous. The EPA may assess chemicals and declare substances to be chemical wastes under the Act. <i>National Environment Protection Council Act 1995</i> (NSW) - establishes the National Environment Protection Council (NEPC),	- Clearly meets minimum standards as has independent regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objectives, operating under its own Act/s. - Falls short of best practice as IPART, NSW Office of Water, DPI Water, Dept. of Environment can be in conflict with administering their Acts and in setting objectives

	Current state of play	Assessment against minimum standards & best practice regulation
	which comprises a Minister from the Commonwealth and each state and territory. The objective of NEPC is to ensure people are equally protected from air, water and soil pollution and from noise, no matter where they live in Australia. By eliminating differences between participating states in the adoption or implementation of major environment protection measures, distortion of decisions made by the business community and potential fragmentation of markets will be prevented. A similar Act is in place for each state and territory.	
<i>Regulatory decision making processes</i>	• The Regulator generally seeks inputs and consultation with established procedures and mechanisms for engaging with regulated entities and other stakeholders. • However, the Regulator does not regularly seek feedback to mitigate costs and inefficiencies • Judicial review of decision-making is available • The License is subject to regular review and licence holders can make cases for change • Annual reporting and reporting monthly via electronic centralised databases (to which licensed entities and activities submit data) and submissions.	• Meets minimum standards but not best practice as: ○ The Regulator generally seeks input and consultation with stakeholders and regulated entities, however, the Regulator does not regularly seek feedback to mitigate costs and efficiencies. ○ Robust decision making tools are not necessarily in place and there is often inconsistency in application and outcomes across regions
<i>Instruments or form of regulation</i>	• Regulator takes some risk-based approaches (although they are not deployed consistently), but generally operates as definition and control where penalties are applied.	• Meets minimum standards but falls short of best practice as: ○ Regulator takes some risk-based approaches (although not deployed consistently)

	Current state of play	Assessment against minimum standards & best practice regulation
	- For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. - There is a comprehensive approach to monitoring water, waste, noise, air, odour and other environmental attributes where appropriate (with a bi-annual surveillance of health of catchments and waterways and the development of an index of waterway condition), although does not necessarily adapt quickly to changing technologies and techniques. - Potential availability of 1D / 2D models. However, data analytics not heavily deployed but developing and use of modelling and 3D is variable - Setting explicit licence conditions for point source discharges - Load based licensing for pollutants of concern - Regional objectives or jurisdictional water quality based plans prepared - Offsets and market based approaches not used - Localised objectives for environmental catchment based outcomes are often determined - Compliance auditing seeks to mitigate the risk of non-compliance and poor environmental outcomes	Limiting burden on compliance and monitoring is not well developed
Public health regulation		

	Current state of play	Assessment against minimum standards & best practice regulation
Governance arrangements	- Public health in NSW in relation to urban water, is governed by the NSW Department of Primary Industries – Office of Water and the NSW Health Department. - The NSW Office of Water controls the key governing legislation for the 105 water utilities exercising drinking supply functions under the following: <i>Water Act 1912 / Water Management Act 2000</i>: The objective of the Act is the sustainable and integrated management of the state's water for the benefit of both present and future generations. <i>Local Government Act 1993</i>: The Act prescribes the water supply functions to Local Governments (Local Water Utilities) in non-metropolitan urban communities. - NSW Health monitor and enforce compliance with drinking water standards, issue guidelines, undertake water quality monitoring and promote public awareness of drinking water quality issues. On-site waste management systems are required to have a NSW Health Accreditation. NSW Health also provide guidelines for stormwater and greywater to regulate local council's management under Section 68 of the <i>Local Government Act 1993</i>. - Water quality issues potentially impacting on public health are the responsibility of NSW Health, under their key act/regulations: <i>Public Health Act 2010</i> and the <i>Public Health Regulation 2012</i> require drinking water suppliers to develop and adhere to a 'quality assurance program' (or drinking water management system). This requirement applies to water suppliers defined in the Act, including	- Meets minimum standards but falls short of best practice as: - The Regulator has deterministic powers and retains a core mission and clearly stated objectives and principles - IPART, NSW Office of Water, DPI Water, Dept. of Environment and Dept. of Health can be in conflict with administering their Acts and in setting objectives and compliance outcomes.

	Current state of play	Assessment against minimum standards & best practice regulation
	water utilities, private water suppliers and water carters. (NSW Health, 2013). ○ <i>Water Industry Competition Act 2006</i> - requires compliance to the ADWG and the AGWR and this is audited via operating licences and audit schedules. WICA specifies that for licensees, all drinking water must ensure compliance with the Public Health Act. • Together the Office of Water and NSW Health legislate the Australian Drinking Water Guidelines and the Australian Guidelines for Water Recycling via their combined guideline, NSW Guidelines for Drinking Water Management Systems 2013 to be used by water suppliers (Utilities and Local Government). • Independent regulator with powers to determine public health outcomes and provide recommendations to the Minister on licence approvals, under specified objectives of the ADWG and AGWR. • The Regulator has deterministic powers and retains a core mission and clearly stated objectives and principles • Major water utilities (Sydney Water and Hunter Water) and a handful of local water utilities exercise water supply functions under the <i>Water Management Act 2000</i>. Majority of Local Governments exercise water supply functions under Division 2 Part 3 Chapter 6 <i>Local Government Act 1993</i>. • Major and minor water utilities are subject to different Acts and Regulations, but all underpinned by the ADWG and AGWR • Local water utilities must also comply with the NSW Best-Practice Management of Water Supply and Sewerage Framework and Best	

	Current state of play	Assessment against minimum standards & best practice regulation
	Practice Management of Water Supply and Sewerage Guidelines. (Office of Water & NSW Health, 2013). A Drinking Water Management System developed and implemented in line with these guidelines satisfies the requirement for a quality assurance program in the Public Health Act 2010. For many water suppliers, this will include complying with requirements of the NSW Health Drinking Water Monitoring Program.	
<i>Regulatory decision making processes</i>	- The Regulator undertakes a generally transparent process, particularly for large utilities, with all audit and compliance monitoring publicly available, including clear specification of the rationale underlying any regulatory decisions. - The Regulatory provides training, holds public forums and implements guidance notes. - Judicial review of decision-making is available - Regulator seeks and provides opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums etc.). - However, the Regulator does not regularly seek feedback to mitigate costs and inefficiencies - The Regulator generally seeks inputs and consultation with other agencies and recognises interaction between different regulator's decision-making - Independent auditors are used and a panel is established	- Meets minimum standards but falls short of best practice as: - The Regulator generally seeks input and consultation with stakeholders and regulated entities, however, the Regulator does not regularly seek feedback to mitigate costs and efficiencies.

	Current state of play	Assessment against minimum standards & best practice regulation
	- Act/s, Regulation/s and Codes used which are readily accessible. - Monitoring of compliance and annual reporting, or other frequency as deemed appropriate	
<i>Instruments or form of regulation</i>	- The Regulator places a strong emphasis on water quality and health outcomes, then environment, then price - Service standards are a component of audit, but do not necessarily align with public health requirements directly - Regulator takes some high-degree, risk-based approaches (water and recycled water schemes, with higher compliance and audit required for higher risk settings), but generally operates as definition and control - Definition and control approach to implementation of regulation where penalties are applied. - For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. This is keeping with the ADWG and the AGWR - Water quality plans to be developed, monitored, updated and maintained (in accordance with ADWG or AGWR) and sent to regulator on a jurisdiction basis - Operating licences that clearly specifies the obligations and performance targets imposed on the water service providers, adopts a risk-based approach, and is subject to annual review	- For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. This is keeping with the ADWG and the AGWR. - Incentive schemes are not clear nor considered.

Source: Frontier Economics and Arup

Victoria

Table 14: Assessment of economic, environmental and public health regulation of the urban water sector in Victoria

	Current state of play	Assessment against minimum standards & best practice regulation
Economic regulation		
<i>Governance arrangements</i>	- The ESC is an independent regulator with powers to determine prices, under specified objectives (the <i>Water Act 1989</i>, <i>Essential Services Commission Act 2001</i>, the <i>Water Industry Act 1994</i> and the Water Industry Regulatory Order (WIRO)). - The ESC has deterministic powers to determine prices in any manner the Commission considers appropriate - While the ESC Act makes a clear distinction between a primary objective and matters which the Commission must have regard to, section 8A (2) also requires the ESC to have consideration for the objectives in the Water Industry Act and by extension the Water Industry Regulatory Order (WIRO). - Victoria is one of the few jurisdictions that incorporate an appeals mechanism. The appeals mechanism allows for a broad range of grounds for appeal, which includes bias, material error of fact, unreasonableness give circumstance or unlawful. The appeals themselves are heard by an independent appeal panel that has set timelines for decisions. - The Victorian framework explicitly empowers and requires cooperation between the ESC and other bodies (third party regulators). Consistent with this requirement the ESC has established many Memorandums of Understanding (MOUs) which set out the respective roles of the Commission and the other party and how the parties will consult with each other and how they will manage any potential disputes.	Meets both minimum standards and best practice as is independent regulator with a core mission, deterministic powers to set prices and clearly specified objectives, operating under its own Act.

	Current state of play	Assessment against minimum standards & best practice regulation
	Decisions on the scope of the ESC's jurisdiction are made by government — the WIRO sets out prescribed services and declared services.	
<i>Regulatory decision making processes</i>	- The ESC undertakes a detailed public review providing opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums etc.) to determine maximum prices and operating licences to apply for the major urban water authorities. - Regulator undertakes a transparent process including clear specification of the rationale underlying any regulatory decisions - Regulator recognises interaction between different regulator's decision-making	- Meets both minimum standards and best practice as: - Detailed public review and generally transparent process. - Provides strong incentives for regulated water businesses to engage fully with customers - Recognises the interaction between different regulators' decision-making.
<i>Instruments or form of regulation</i>	- Regulator uses incentive form of economic regulation and ensures forms of regulation provides opportunity to recover the efficient cost of service provision. - Appropriate and well-defined forms of price control are applied to meet the relevant circumstances. While price caps appear to be the default form of price regulation for water businesses there are examples where the ESC has approved revenue caps and hybrid forms of price control for individual businesses. - Regulator allows businesses to propose risk-sharing mechanisms such as cost pass through to manage uncontrollable and unforeseen cost changes. - PREMO framework links the returns earned by a water business to its ambition in relation to proposed service outcomes, the extent to which the ESC agrees with the business's self-assessment and how well it delivers on its performance commitments. The framework is designed to:	- Clearly meets minimum standards in terms of regulatory approach - New PREMO model seeks to adopt elements of best practice incentive regulation but has yet to be tested.

	Current state of play	Assessment against minimum standards & best practice regulation
	○ reward businesses that submit ambitious proposals in the pursuit of delivering high quality services valued by their customers; and ○ create incentives for well-informed, accurate and reliable submissions from water authorities.	

Environmental regulation

Governance arrangements	• Responsibility for environmental regulation lies principally with the EPA which establishes, monitors and enforces discharge standards for sewage treatment plants (STPs), and plays a key role in their works approval processes. The Victorian EPA uses market-based mechanisms, in particular offsets and nutrient trading schemes. • The Department of Human Health Services plays a strong role in the implementation of recycled water schemes and associated infrastructure. • Independent regulator with a core mission. • Regulator possesses deterministic powers to set environmental outcomes and clearly specified objectives and principles, (including Regulator reporting to Minister on licence approvals) operating under its own Act/s. Key legislative instruments include: ○ <i>Environment Protection Act 1970</i> - outcome oriented, with a basic philosophy of preventing pollution and environmental damage by setting environmental quality objectives and establishing programs to meet them. This includes many attributes that are related to urban water. The Act covers works approvals, licences, R&D projects, pollution abatement notices, waste transport and appeals mechanisms. ○ <i>Pollution of Waters by Oils and Noxious Substances Act 1986</i> - predominantly refers to the protection of the marine environment and would be applied in urban	• Clearly meets minimum standards as has independent regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objectives, operating under its own Act/s. • Falls short of best practice as ESC, DHHS, Dept. of Environment can be in conflict with administering their Acts and in setting objectives.
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	Current state of play	Assessment against minimum standards & best practice regulation
	water in associated with such projects and discharges (such as the Desalination Plant). - o <i>National Environment Protection Council (Victoria) Act 1995</i> - complementary legislation to the other states and the Commonwealth, as outlined above under NSW. - o <i>Climate Change and Environment Protection Amendment Act 2012</i>. - o <i>Environment Protection (Amendment) Act 2006 (Victoria)</i> - o The <i>State Environment Protection Policy (Waters of Victoria)</i> – sets the framework for government agencies, businesses and the community to work together, to protect and rehabilitate Victoria's surface water environments. - o Victoria uses the ANZECC Guidelines for some indicators and objectives (e.g. to guide drinking and recreational water quality requirements). For others (most notably, ecosystem protection) the specific guideline values are conservative, generic values which are intended to trigger further investigation and the development of more appropriate, locally specific objectives based on the type of water resource. ● ESC, DHHS, Dept. of Environment can be in conflict with administering their Acts and in setting objectives	
<i>Regulatory decision making processes</i>	● Procedures and mechanisms for engagement with regulated entities and other stakeholders undertaken ● Judicial review of decision making is available ● The Regulator generally seeks inputs and consultation with other agencies ● The Regulator does not regularly seek feedback to mitigate costs and inefficiencies.	● Meets minimum standards but falls short of best practice as robust decision making tools are not necessarily in place and there is often inconsistency in application and outcomes across regions

	Current state of play	Assessment against minimum standards & best practice regulation
	Centralised databases to which licensed entities and activities submit data, monthly and annually.	
<i>Instruments or form of regulation</i>	- Definition and control approach to implementation of regulation where penalties are applied - For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. - Compliance auditing seeks to mitigate the risk of non-compliance and poor environmental outcomes - Regulator takes some risk-based approaches, but generally operates as definition and control - There is a comprehensive approach to monitoring water, waste, noise, air, odour and other environmental attributes where appropriate (including the surveillance of health of catchments and waterways and development of index of waterway condition), although it does not necessarily adapt quickly to changing technologies and techniques. - Data analytics not heavily deployed but developing and use of modelling and 3D is variable.	Meets minimum standards but falls short of best practice in adopting outcomes-based regulation
Public health regulation		
<i>Governance arrangements</i>	Water quality issues potentially impacting on public health are the responsibility of the Department of Health and Human Services (DHHS), which monitors and enforces compliance with drinking water standards, issues guidelines, promotes public awareness of drinking water quality issues, validate Class A Recycled Water plants	Meets minimum standards as has independent regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objectives, operating under its own Act/s.

	Current state of play	Assessment against minimum standards & best practice regulation
	and endorse plants in specific circumstances and has a defined role in incident management and emergency response. (DHHS, 2017). - The Regulator has deterministic powers to determine public health outcomes and retains a core mission and clearly stated objectives and principles, under specified objectives of the ADWG and AGWR. Public health regulation for drinking water is informed by: <i>The Water Act 1989</i> - The Act applies to a range of designated water businesses (water suppliers and water storage managers) and other statutory authorities that supply drinking water to the public, including Parks Victoria and alpine resort management boards. <i>The Health Act 1958</i>; <i>The Safe Drinking Water Act 2003</i> (informed by the AWDG) <i>The Safe Drinking Water Regulations 2015</i> - Health Regulator reports to a Minister responsible for its administration (e.g. makes recommendations to Minister on licence approvals). - Recycled water and Effluent discharge is monitored by the EPA who have developed the following publications for the water authorities to reduce impact on public health and the environment (informed from the ANZECC Guidelines for Sewage Systems) and develop reclaimed water. Guidelines include: - Use of Reclaimed Water Guidelines - Onsite Wastewater Management Guidelines - Guidelines for risk assessment of wastewater discharges to waterways - Managing sewage discharges to inland waters	- However, falls short of best practice as: - Several Departments and Ministers are responsible for water quality health leading to conflict and communication. - The EPA Victoria water reuse guidelines are stricter than the National Water Reuse guidelines, arguably leading to high costs associated with reuse and the prevention of innovation.

	Current state of play	Assessment against minimum standards & best practice regulation
	- Guidelines for environmental management: dual pipe water recycling schemes – health and environmental risk management. - Several Departments and Ministers are responsible for water quality health leading to conflict and communication issues (ESC, DHHS and Dept. of Environment can be in conflict with administering their Acts and in setting objectives and compliance outcomes)	
<i>Regulatory decision making processes</i>	- The Regulator does not regularly seek feedback to mitigate costs and inefficiencies - The Regulator undertakes a generally transparent process, particularly for large utilities, with all audit and compliance monitoring publicly available (including clear specification of the rationale underlying any regulatory decisions) - Regulator seeks and provides opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums etc.). - Formal interaction with other relevant agencies exists – the Regulator recognises interaction between different regulator's decision-making - Training is provided, public forums held and guidance notes are implemented - Independent auditors are used and a panel is established - Judicial review of decision-making is available - Act/s and Regulation/s and Codes used which are readily accessible.	- Meets minimum standards as the Regulator generally seeks input and consultation with stakeholders and regulated entities. - However, falls short of best practice as the Regulator does not regularly seek feedback to mitigate costs and efficiencies.
<i>Instruments or form of regulation</i>	The Regulator places a strong emphasis on water quality and health outcomes, then environment, then price.	- Incentive scheme are not clear nor considered. - Operating licences that clearly specifies the obligations and performance targets imposed

	Current state of play	Assessment against minimum standards & best practice regulation
	• Water quality plans developed, monitored, updated and maintained (in accordance with ADWG or AGWR) and sent to regulator on a jurisdiction basis • Definition and control approach to implementation of regulation where penalties are applied • For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. This is keeping with the ADWG and the AGWR. • Includes monitoring of compliance and annual reporting, or other frequency as deemed appropriate (e.g. the water businesses report monthly and yearly to the DHHS and the DHHS also conduct regular audits (DHHS, 2017)). • Regulator takes some risk-based approaches (e.g. a risk-based tier system is applied to water and recycled water schemes, with higher compliance and audit required for higher risk settings), but generally operates as definition and control • The regulator has sought to reduce costs for validation of recycled water schemes which is in response to stakeholder concerns • Service standards are a component of audit, but do not necessarily align with public health requirements directly	on the water service providers, adopts a risk-based approach, and is subject to annual review.

Source: Frontier Economics and Arup

Queensland

Table 15: Assessment of economic, environmental and public health regulation of the urban water sector in Queensland

	Current state of play	Assessment against minimum standards & best practice regulation
Economic regulation		
<i>Governance arrangements</i>	- The <i>Queensland Competition Authority Act 1997</i> (Qld) establishes the QCA. QCA functions include ensuring competition in respect of government business activities, price monitoring of monopoly services and determining third party access applications. - The QCA has undertaken pricing investigations and monitoring on matters referred to it by the Premier or Treasurer since 1999 (e.g. Burdekin Pricing Review and Gladstone Area Water Board) (QCA 2010). - In the past, the QCA monitored water prices in south east Queensland (SEQ) to assess whether households and businesses are paying a price that is comparable with the costs of providing the relevant services, but the QCA did not set or recommend prices. However, the QCA currently has no role in urban retail water (but does undertake periodic investigations of, and recommends, bulk water prices when requested by the Queensland Government). The bulk water price is however set by the Queensland Government.	Fails to meet minimum standards as while the QCA has been established as an independent regulator, it currently has no active role in urban retail water and does not have determinative powers to set prices.
<i>Regulatory decision making processes</i>	When the QCA previously undertook pricing investigations it conducted transparent public reviews. However, it currently has no active role in regulating urban water.	Meets minimum standards when it undertakes reviews.

	Current state of play	Assessment against minimum standards & best practice regulation
<i>Instruments or form of regulation</i>	For the urban water sector, the QCA has in the past had more of an oversight role. Through the prices oversight process, the QCA either investigated the pricing practices of declared government monopolies or simply monitored the prices charged by them when directed by the Government. However, it currently has no active role in regulating urban water.	n/a

Environmental regulation

<i>Governance arrangements</i>	- The Qld Department of Environment and Heritage manages the health of Queensland's creeks, rivers, estuaries and oceans and have a strong directive in maintaining water quality, aquatic biodiversity and habitats is critical for ecological, economic and social well-being. They contribute to monitoring ecosystem health in rivers, estuaries and coastal areas throughout the eastern coast of Queensland. In addition, the department regulates industries through licensing waste outputs into waterways. - Independent Environmental regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objectives (e.g. the Regulator reports to a Minister responsible for its administration and makes recommendations to Minister on licence approvals), operating under its own Act/s. - The <i>Environmental Protection Act 1994</i> lists obligations and duties to prevent environmental harm, nuisances and contamination. It also sets out enforcement tools that can be used when offences or acts of non-compliance are identified. The two primary duties that apply to everyone in Queensland are: - General environmental duty – which means a person must not carry out any activity that causes or is likely to cause environmental harm, unless measures to prevent or minimise the harm have been taken; and	- Meets minimum standards but fails in meeting all aspects of best practice. - QLD Health, QCA and QEH can be in conflict with administering their Acts and in setting objectives. - Minimal interaction between frameworks to achieve best catchment outcome.
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	Current state of play	Assessment against minimum standards & best practice regulation
	○ Duty to notify of environmental harm – to inform the administering authority and landowner or occupier when an incident has occurred that may have caused or threatens serious or material environmental harm.	
<i>Regulatory decision making processes</i>	• The Regulator generally seeks inputs and consultation with other agencies, with established procedures and mechanisms for engagement with regulated entities and other stakeholders in place. • The Regulator does not regularly seek feedback to mitigate costs and inefficiencies • Judicial review of decision-making is available	• The Regulator generally seeks input and consultation with stakeholders and regulated entities, however, the Regulator does not regularly seek feedback to mitigate costs and efficiencies. • Robust decision making tools are not necessarily in place and there is often inconsistency in application and outcomes across regions
<i>Instruments or form of regulation</i>	• For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. • Regulator takes some risk-based approaches (although they are not always applied consistently), but generally operates as definition and control where penalties are applied. • There is a comprehensive approach to monitoring water, waste, noise, air, odour and other environmental attributes where appropriate (e.g. Surveillance of health of catchments and waterways and development of index of waterway condition), although does not necessarily adapt quickly to changing technologies and techniques.	• Offsets and market based approaches not used and therefore does not meet best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
	- Setting explicit licence conditions for point source discharges. The License is subject to regular review and licence holders can make cases for change. - Localised objectives for environmental catchment based outcomes are often determined (e.g. regional objectives or jurisdictional water quality based plans prepared) - Load based licensing for pollutants of concern. - Annual reporting and reporting monthly by licenced entities and activities via centralised electronic databases and submissions, however, data analytics not heavily deployed but developing, and use of modelling and 3D is variable - Compliance seeks to mitigate the risk of non-compliance and poor environmental outcomes. However, there is limiting burden on compliance and monitoring is not well developed	
Public health regulation		
Governance arrangements	- Public health, including regulating the quality and provision of drinking and recycled water quality and service provider performance is the responsibility of the independent regulator, Queensland Health. Key legislation includes: <i>The Public Health Act 2005</i> – grants Queensland health powers to respond to public health incidents, and the power to prosecute if a drinking water supplier provides unsafe drinking water or if a recycled water supplier provides recycled water that is not fit for use. <i>The Public Health Regulations 2005</i> (that support the <i>Water Supply (Safety and Reliability) Act 2008</i>) (e.g. Queensland Health can set standards for recycled water quality under Par 6A) <i>Water Supply (Safety and Reliability) Act 2008</i>- Queensland Health is responsible for its implementation monitoring and enforcement of the requirements for recycled water and drinking water outlined in the Act. To date, Queensland Health has set standards for recycled water used to augment	- Independent regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objectives, operating under its own Act/s. - Some reference to the ADWG and AGWR but not necessarily applied to all schemes. - A number of Departments and Ministers are responsible for water quality health leading to

	Current state of play	Assessment against minimum standards & best practice regulation
	drinking water supplies, dual reticulation schemes, and for irrigation of minimally processed food crops. - The drinking water quality requirements in the <i>Public Health Act 2005</i> and <i>Public Health Regulations 2005</i> are based on the ADWG to ensure safety of drinking water and reuse of water. - Health Regulator reports to a Minister responsible for its administration and makes recommendations to Minister on licence approvals. - The Regulator has deterministic powers and retains a core mission and clearly stated objectives - Drinking water service providers need to be registered under <i>the Water Supply (Safety and Reliability) Act 2008</i> and have a Drinking Water Quality Management Plan to provide the drinking water service, and they are then subject to state government regulation. - Bulk water providers, such as Seqwater and Sunwater, generally provide water to local councils in their area of operations as the source of their drinking water supplies. (DEWS, 2017). - Recycled water providers are required to have an approved recycled water management plan for the supply of recycled water, in compliance with the Recycled Water Management and Validation Guidelines (based on the AGWR). - Several Departments and Ministers are responsible for water quality health leading to conflict and communication issues (e.g. QLD Health and QEH can be in conflict and can be subject to communication concerns)	conflict and communication issues.
<i>Regulatory decision making processes</i>	The Regulator undertakes a generally transparent process, particularly for large utilities, with all audit and compliance monitoring publicly available	The Regulator generally seeks input and consultation with stakeholders and regulated entities, however, the Regulator does not regularly

	Current state of play	Assessment against minimum standards & best practice regulation
	- Regulator seeks and provides opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums etc.), with training provided, public forums held and guidance notes implemented - Formal interaction with other relevant agencies exists (Regulator recognises interaction between different regulator's decision-making) and generally seeks input and consultation with other agencies. - The Regulator does not regularly seek feedback to mitigate costs and inefficiencies - Judicial review of decision-making is available - Independent auditors are used - Act/s and Regulation/s and Codes used which are readily accessible.	seek feedback to mitigate costs and efficiencies.
<i>Instruments or form of regulation</i>	- The Regulator places a strong emphasis on water quality and health outcomes, then environment, then price. - Definition and control approach to implementation of regulation where penalties are applied - Clearly specified objectives are outlined and are risk-based to a high degree - A risk-based tier system is applied to water and recycled water schemes, with higher compliance and audit required for higher risk settings - Regulator takes some risk-based approaches, but generally operates as definition and control - Water quality plans developed, monitored, updated and maintained (in accordance with ADWG or AGWR) and sent to regulator on a jurisdiction basis - For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. This is keeping with the ADWG and the AGWR	Definition and control approach to implementation of regulation where penalties are applied means that it meets minimum standard but not best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
	• The Regulator provides a framework for regulated entities including registration of water and sewerage providers: ○ Monitoring of compliance and annual reporting, or other frequency as deemed appropriate; ○ monitoring of drinking water quality management plans through annual performance reporting; and ○ monitoring of ongoing drinking and recycled water quality incident reporting and management (DEWS, 2017). • Operating licences that clearly specifies the obligations and performance targets imposed on the water service providers, adopts a risk-based approach, and is subject to annual review. • Incentive scheme are not clear nor considered • Service standards are a component of audit, but do not necessarily align with public health requirements directly	

Source: Frontier Economics and Arup

South Australia

Table 16: Assessment of economic, environmental and public health regulation of the urban water sector in South Australia

	Current state of play	Assessment against minimum standards & best practice regulation
Economic regulation		
<i>Governance arrangements</i>	• ESCOSA determines the maximum amount of revenue SA Water is permitted to earn over each regulatory period for its regulated services (based on its assessment of the efficient costs of SA Water meeting its obligations and service standards), but prices to recover this revenue are set by Government ○ A licensing regime is established under Division 2 of the Water Industry Act whereby any person or entity providing a water or sewerage “retail service” in South Australia will be required to be licensed by ESCOSA. ○ Legislation providing for third party access (TPA) regime for the water sector in South Australia came into effect on 1 July 2016. • Individual tariffs to recover the maximum revenue are determined by SA Water (consistent with Government policy). • Treasurer responsible for issuing Pricing Orders	• Meets minimum standards as is independent regulator but falls short of best practice as: ○ Govt determines prices ○ Matters for ESCOSA consideration under Act can be conflicting, with no formal direction to guide the regulator in how to make trade-offs between objectives.
<i>Regulatory decision making processes</i>	• Regulator periodically seeks feedback on and review their broad approaches to regulation. • Regulator undertakes a transparent process including clear specification of the rationale underlying any regulatory decisions	• The Regulator generally seeks input and consultation with stakeholders and regulated entities, but has not yet adopted best practice consultation techniques emerging elsewhere.

	Current state of play	Assessment against minimum standards & best practice regulation
	- Regulator seeks and provides opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums etc.). - Regulator recognises interaction between different regulator's decision-making - The current framework does not materially engage customers in regulatory processes / decision-making. There is limited understanding of the level of service, pricing structure or environmental outcomes desired by customers and the amount they are willing to pay. - Merits review of decision-making is not available	
<i>Instruments or form of regulation</i>	- Regulator typically uses incentive form of economic regulation, however, there is limited use of clearly specified incentive mechanisms based on observable/measurable outcomes that provide for increased service standards - Regulator ensures forms of regulation provide opportunity to recover the efficient cost of service provision. - Legal requirement for revenue caps with some lighter-handed regulatory options available. - Limited use of robust benchmarking to complement bottom-up cost forecasts - Regulator utilises revenue caps with mechanisms to manage demand risk and some risk-sharing mechanisms (such as a cost pass through mechanism to manage risk of changes to legal obligations or extraordinary events that impact costs) - However, limited investigation of alternative risk-sharing mechanisms that may efficiently manage risk and lower costs/prices for customers	Meets minimum standards but falls short of best practice.

Environmental regulation

	Current state of play	Assessment against minimum standards & best practice regulation
<i>Governance arrangements</i>	- Independent regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objectives, operating under its own Act/s. Key legislation includes: - The <i>Environment Protection Act 1993</i> provides the regulatory framework to protect South Australia's environment, including land, air and water. This legislation was the result of the streamlined integration of six Acts of Parliament and the abolition of the associated statutory authorities. An Environment Protection Policy can be issued to impose penalties associated with waste, water, air and noise – all of which are applicable to urban water schemes. - Codes of practice exist covering a range of industries defining levels and limits for set measurable outcomes. The codes of practice are linked to the Environment Protection Water Quality Policy 2015. Notable for urban water are aquifer storage and recovery, wastewater overflow management, stormwater discharge to groundwater (drafted), and managed aquifer recharge (drafted). - Environment Regulator reports to a Minister responsible for its administration (e.g. regulator makes recommendations to Minister on licence approvals) - ECOSA, DEWNR and SA Health can be in conflict with administering their Acts and in setting objectives	Independent regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objectives, operating under its own Act/s.
<i>Regulatory decision making processes</i>	- The Regulator generally seeks inputs and consultation with other agencies, with established procedures and mechanisms for engagement with regulated entities and other stakeholders. - The Regulator does not regularly seek feedback to mitigate costs and inefficiencies - Judicial review of decision-making is available	Robust decision making tools are not necessarily in place and there is often inconsistency in application and outcomes across regions.

	Current state of play	Assessment against minimum standards & best practice regulation
<i>Instruments or form of regulation</i>	- For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. - Regulator takes some risk-based approaches (although not always applied consistently), but generally operates as definition and control approach where penalties are applied - Codes of Practice are used to define levels and measurable outcomes that are definitive and not risk-based - Annual reporting and reporting monthly via centralised electronic databases and submissions where licensed entities and activities submit data. - Data analytics not heavily deployed but developing and use of modelling and 3D is variable - There is a comprehensive approach to monitoring of water, waste, noise, air, odour and other environmental attributes where appropriate (including development of index of waterway condition), although does not necessarily adapt quickly to changing technologies and techniques. - Site contamination, air, water, noise and other monitoring is established, documented and monitored by the SA EPA and includes urban water schemes and their impact/s. - Compliance auditing seeks to mitigate the risk of non-compliance and poor environmental outcomes, however, there exists a limiting burden on compliance and monitoring is not well developed. - Setting explicit licence conditions for point source discharges- the licence is subject to regular review and licence holders can make cases for change - Load based licensing for pollutants of concern - Offsets and market based approaches not used	For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific which means it meets minimum standard but falls short of best practice, although moving towards it.

	Current state of play	Assessment against minimum standards & best practice regulation
	- Localised objectives for environmental catchment based outcomes are often determined (including regional objectives or jurisdictional water quality based plans) - A wastewater incident notification and communication protocol is in place to formalise and document instances of concern and impact. This includes direct and ongoing response and lessons learnt.	
Public health regulation		
Governance arrangements	- SA Health is an independent regulator with a core mission and clearly stated objectives and powers to determine public health outcomes (under specified objectives of ADWG and AGWR), including the monitoring of safe drinking water and public health. The Health Regulator reports to a Minister responsible for its administration (e.g. the regulator makes recommendations to Minister on licence approvals). - The Department of Environment, Water and Natural resources has the responsibility of providing advice on, and administering under delegated authority the Water Acts, including: <i>Water (Commonwealth Powers) Act 2008</i> <i>Water Industry Act 2012</i> <i>Water Resources Act 1997</i> <i>Local Government Act 1999</i> (Schedule 1A - Implementation of Stormwater Management Agreement). - To ensure a consistent approach to the delivery of safe drinking water the <i>Safe Drinking Water Act 2011</i> and <i>Safe Drinking Water Regulations 2012</i> (based on the ADWG) commenced on 1 March 2013. This is also supported by the <i>Public and Environmental Health Act 1995</i>.	- Independent regulator with a core mission, deterministic powers to set environmental outcomes and clearly specified objectives, operating under its own Act/s therefore meeting minimum standard. - There is conflict possible between departments and ministers and at a scheme and organisational level and as such fails to meet best practice. This also occurs between State and Local government, and scale and size of scheme.

	Current state of play	Assessment against minimum standards & best practice regulation
	- Wastewater and water reuse is regulated as per the South Australian Public Health (Wastewater) Regulations 2013. Local council is the approval authority for the installation of on-site wastewater treatment systems that service 50 EP. All systems must be approved by the Department of Health. - The management of recycled water in SA is covered by the <i>Public Health and Environment Act 1987</i> and the <i>Public and Environmental Health (Waste Control) Regulation 1995</i>, which states that any waste that contains human waste and abattoir wastewater requires approval from the Department of Health if it is to be recycled. - The Eastern Health Authority provides a wide range of environmental health services to the community in the eastern and inner northern suburbs of Adelaide. - Several Departments and Ministers are responsible for water quality health leading to conflict and communication issues (e.g. ECOSA, DEWNR and SA Health can be in conflict with administering their Acts and in setting objectives and compliance outcomes).	
Regulatory decision making processes	- The Regulator undertakes a generally transparent process (including clear specification of the rationale underlying any regulatory decisions), particularly for large utilities, with all audit and compliance monitoring publicly available - Regulator seeks and provides opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums, providing training and implementing guidance notes). - Regulator recognises interaction between different regulators' decision-making and generally seeks input and consultation with other agencies via a formal interaction process. - The Regulator does not regularly seek feedback to mitigate costs and inefficiencies - Judicial review of decision-making is available	- Robust decision making tools are not necessarily in place and there is often inconsistency in application and outcomes across regions thereby not meeting best practice. - The Regulator does not regularly seek feedback to mitigate costs and inefficiencies.

	Current state of play	Assessment against minimum standards & best practice regulation
	Act/s and Regulation/s and Codes used which are readily accessible	
<i>Instruments or form of regulation</i>	- The Regulator places a strong emphasis on water quality and health outcomes - For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific (in keeping with the ADWG and the AGWR) - Regulator takes some risk-based approaches (e.g. A risk-based tier system is applied to water and recycled water schemes, with higher compliance and audit required for higher risk settings), but generally operates as definition and control approach to implementation of regulation where penalties are applied - Incentive scheme are not clear nor considered - Monitoring of compliance and annual reporting, or other frequency as deemed appropriate - Water quality plans developed, monitored, updated and maintained (in accordance with ADWG or AGWR) and sent to regulator on a jurisdiction basis - Operating licences that clearly specifies the obligations and performance targets imposed on the water service providers, adopts a risk-based approach, and is subject to annual review - Service standards are a component of audit, but do not necessarily align with public health requirements directly	For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific (in keeping with the ADWG and the AGWR) meeting minimum standard but not best practice.

Source: Frontier Economics and Arup

Western Australia

Table 17: Assessment of economic, environmental and public health regulation of the urban water sector in Western Australia

	Current state of play	Assessment against minimum standards & best practice regulation
Economic regulation		
<i>Governance arrangements</i>	- The ERA was established under the <i>ERA Act 2003</i> with the powers of inquiry, reporting, access, regulation, licensing and other functions to be administered in respect to utility companies in Western Australia. - The ERA can undertake an inquiry only at the direction of the Treasurer and can only recommend water prices to the Treasurer (taking into account the efficient costs of supplying water services). The Government then decides whether to accept those recommendations and may implement different prices. - The Water Services Act 2012 provides for the licensing of providers of water, wastewater, drainage and irrigation services. This involves issuing licenses, monitoring a licensee's compliance with license conditions, including they meet standards of water quality and ensuring appropriate customer service mechanisms are in place. - The ERA also administers the water services code of conduct which prescribes a minimum set of customer service standards, and approves licensees' financial hardship policies.	- Meets minimum standards but falls short of best practice as: - Regulator has recommendatory role only role in setting prices for water services - prices are reviewed and set by the State Government, as part of the State Budget process.
<i>Regulatory decision making processes</i>	When conducting inquiries into the efficient costs and tariffs for the services of the Water Corporation, Aqwest and Busselton Water, ERA undertakes transparent public reviews.	Meets minimum standards as the Regulator generally seeks input and consultation with stakeholders and regulated entities, but

	Current state of play	Assessment against minimum standards & best practice regulation
		has not yet adopted best practice consultation techniques emerging elsewhere.
<i>Instruments or form of regulation</i>	- ERA applies building blocks methodology in recommending maximum revenues and prices for WA water businesses - Regulator has made some use of alternative forms of regulation (such as lighter handed forms of regulation).	Meets minimum standards as uses accepted building block methodologies but does not directly set price controls
Environmental regulation		
<i>Governance arrangements</i>	- Three agencies have a role in environmental regulation of the water corporations: - The Department of Environment Regulation's main role is to license the discharges from sewage facilities and desalination plants. - The Environmental Protection Authority (EPA) is an independent regulator with powers to set environmental outcomes (e.g. it defines the Statement of Environmental Principles, Factors and Objectives which covers sea, land, water, air, people) and specified objectives, operating under its own Acts (meeting the principles of the <i>Environment Protection Act 1985</i>). - The EPA uses environmental factors and objectives to organise environmental impact assessment and reporting takes a holistic view of the environment and a proposal or scheme's potential impact on the environment. The WA EPA considers significance when determining whether or not to assess a proposal or scheme and recommend whether or not an assessed proposal or scheme may be implemented. Urban water schemes are impacted by this process and are considered.	A range of agencies are involved with differing objectives to protect aspects of the environment and conflict and transparency can be difficult and restricting ability to meet best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
	○ The Department of Parks and Wildlife is responsible for the conservation of wetlands, and marine parks. • Environment Regulator reports to a Minister responsible for its administration - Regulator makes recommendations to Minister on licence approvals. • ERA, WA EPA, Dept. of Water, DEC and Dept. Health can be in conflict with administering their Acts and in setting objectives	
<i>Regulatory decision making processes</i>	• The Regulator generally seeks inputs and consultation with other agencies, with established procedures and mechanisms for engagement with regulated entities and other stakeholders. • The Regulator does not regularly seek feedback to mitigate costs and inefficiencies • Judicial review of decision-making is available	• Robust decision making tools are not necessarily in place and there is often inconsistency in application and outcomes across regions impacting the ability to meet best practice.
<i>Instruments or form of regulation</i>	• Regulator takes some risk-based approaches (although not always applied consistently), but generally operates as definition and control approach to implementation of regulation where penalties are applied • For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. • Localised objectives for environmental catchment based outcomes are often determined • Regional objectives or jurisdictional water quality based plans prepared • Offsets and market based approaches not used	• For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific thereby meeting minimum standard but not best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
	- There is a comprehensive approach to monitoring of water, waste, noise, air, odour and other environmental attributes where appropriate (including the development of index of waterway condition), although does not necessarily adapt quickly to changing technologies and techniques and not necessarily covering the whole of the State - Annual reporting and reporting monthly via centralised electronic databases and submissions to which licensed entities and activities submit data. - However, data analytics not heavily deployed - Setting explicit licence conditions for point source discharges. The License is subject to regular review and licence holders can make cases for change - Compliance seeks to mitigate the risk of non-compliance and poor environmental outcomes - Limiting burden on compliance and monitoring is not well developed	
Public health regulation		
<i>Governance arrangements</i>	- Managed by an Environmental Regulator (Health Department is a referral agency only), with a core mission, deterministic powers and clearly stated objectives. - The Regulator reports to a Minister responsible for its administration - Regulator makes recommendations to Environment Minister on licence approvals - The Department of Water assists the Minister for Water in administering the <i>Water Services Act 2012</i>. Water suppliers (both large and small) must adhere to the <i>Water Services Act 2012</i>. - The <i>Public Health Act 1911</i> is the main regulation for wastewater management, covering any waste management system that is not connected to a sewer. Under the <i>Public Health Act 1911</i> a wastewater	Managed by an Environmental Regulator (Health Department is a referral agency only), with a core mission, deterministic powers and clearly stated objectives that meet minimum standard.

	Current state of play	Assessment against minimum standards & best practice regulation
	system servicing a single dwelling on a single plot or producing less than 540 litres per day requires local government approval and the system must be approved by the WA Department of Health. ○ The use of greywater, in sewered or unsewered areas, is covered by the <i>Code of Practice for the Reuse of Greywater in Western Australia</i> (Water Corporation, Department of Environment and Department of health 2005). ○ Recycled Water is regulated by the Department of Environment and Conservation, with advice sought from the Department of Health, as per the <i>Environmental Protection Act 1986</i>. The Guidelines for the Non-Potable Use of Recycled Water in Western Australia are the key guidelines for the regulation of recycled water. They are based off work previously completed by other agencies and organisations in line with the AGWR. • Under the ADWG drinking water scheme suppliers and most other drinking water service providers must monitor their systems and report the results to the Department of Health in accordance with agreed protocols • Unlike other states, Western Australia does not have its own Safe Drinking Water Act. Drinking water quality is monitored by the Advisory Committee for the Purity of Water (a non-statutory interdepartmental committee that operates under the chairmanship of the Department of Health). This committee also recommends improvements in monitoring and management protocols to the Ministers responsible for Health and Water Resources. It is associated with the Water Services Licensing Act (1995) to supply drinking water. • The Health Department is the agency principally assisting the Minister for Health in the administration of the Fluoridation of Public Water Supplies Act 1966 (the Act) and the provisions of the Act are binding on the Corporation. • Several Departments and Ministers are responsible for water quality health leading to conflict and communication issues (e.g. ERA, WA EPA, Dept. of Water, DEC and Dept. Health can be in conflict with administering their Acts and in setting objectives and compliance outcomes. This is mitigated to some	• Some reference to the ADWG and AGWR but not necessarily applied to all schemes which impacts meeting best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
	degree by an MOU between Water Corporation and the WA Health Department (the publicly available document notes outdated).	
<i>Regulatory decision making processes</i>	- The Regulator undertakes a generally transparent process, with all audit and compliance monitoring publicly available, including clear specification of the rationale underlying any regulatory decisions. - The Regulator generally seeks inputs and consultation with other agencies via a formal interaction, recognising the interaction between different regulator's decision-making. - Judicial review of decision-making is available - Monitoring of compliance and annual reporting, or other frequency as deemed appropriate - The Regulator does not regularly seek feedback to mitigate costs and inefficiencies	The Regulator does not regularly seek feedback to mitigate costs and inefficiencies.
<i>Instruments or form of regulation</i>	- The Regulator places a strong emphasis on water quality and health outcomes - Regulator takes some risk-based approaches, but generally operates as definition and control where penalties are applied by Environmental Regulator - Service standards are a component of audit, but do not necessarily align with public health requirements directly - Water quality plans developed, monitored, updated and maintained (in accordance with ADWG or AGWR) and send to Health regulator on a jurisdiction basis - Environmental discharge licences that clearly specifies the obligations and performance targets imposed on the water service providers, adopts a risk-based approach, and is subject to annual review - Incentive scheme are not clear nor considered	Regulator takes some risk-based approaches, but generally operates as definition and control where penalties are applied by Environmental Regulator which limits meeting best practice.

Source: Frontier Economics and Arup

Tasmania

Table 18: Assessment of economic, environmental and public health regulation of the urban water sector in Tasmania

	Current state of play	Assessment against minimum standards & best practice regulation
Economic regulation		
<i>Governance arrangements</i>	- The framework for independent economic regulation was established under the provisions of the <i>Industry Act</i> and regulations under that Act, to be administered by the Independent Tasmanian Economic Regulator (OTTER) with the deterministic powers (under specified objectives), clearly stated objectives and a core mission, operating under its own Act/s. The Act sets out the Economic Regulator's functions and powers, including administering the licensing system, providing advice, monitoring and reporting to the Minister and regulating prices, terms and conditions for regulated services. - Water and Sewerage Industry Act has a clearly defined objective that gives primacy to the long-term interests of customers. The Industry Act also provides for a licensing regime, requiring any person or entity owning or operating water and sewerage infrastructure, or supplying water or sewerage services to others to be licensed,	- Independent regulator with a core mission, deterministic powers to set prices and clearly specified objectives, operating under its own Act/s. - Tasmania is one of the few jurisdictions that incorporate an appeal mechanism allowing for a full merits review.
<i>Regulatory decision making processes</i>	- Regulator undertakes a transparent process including clear specification of the rationale underlying any regulatory decisions - Regulator seeks and provides opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums etc.). - Regulator recognises interaction between different regulator's decision-making	Meets minimum standards as the Regulator generally seeks input and consultation with stakeholders and regulated entities, but

	Current state of play	Assessment against minimum standards & best practice regulation
		has not yet adopted best practice consultation techniques emerging elsewhere.
<i>Instruments or form of regulation</i>	- Regulator typically ensures forms of regulation provide opportunity to recover the efficient cost of service provision - Regulator has made limited use of alternative forms of regulation (such as lighter handed forms of regulation). - Regulator makes little to no use of standard risk-sharing mechanisms such as cost pass through no manage uncontrollable and unforeseen cost changes (such as changes in regulatory and/or taxation events) - Regulator uses some forms of incentive economic regulation	Meets minimum standards but falls short of best practice.

Environmental regulation

<i>Governance arrangements</i>	- The Department of Environment Regulation's main role is to license the discharges regarding urban water more specifically, aspects of health and environmental protection cover PCBs, protected environmental values (PEVs), stormwater, remediation programs, toxicity and chemical testing and setting water quality objectives for Tasmania. - The <i>Environmental Management and Pollution Control Act 1994</i> (Tasmania) includes aspects associated with air, land, noise, pollution incidents, resource recovery, waste as well as water. Urban water related schemes are subject to the Act. The overarching principles and objectives for water quality management in Tasmania are provided in the State Policy on Water Quality Management 1997. - Under the State Policy on Water Quality Management 1997 protected environmental values must be set for all Tasmanian surface waters (including estuarine and coastal waters) (PEVs have been developed for all	Clear environmental regulator with monitoring and governance meeting minimum standard but not best practice. Particularly with transfer or conflict between State and Local government.
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	Current state of play	Assessment against minimum standards & best practice regulation
	waterways including estuaries but not groundwater). The Policy requires the Environmental Management and Pollution Control Board and regional planning authorities (councils and/or the Director of Parks & Wildlife Service) to set the PEVs for inland and coastal waterways. Setting of PEVs is an open and consultative process involving all interested industry & community groups. Where a fully representative catchment management group already exists, it is used to seek community and industry involvement in the PEV setting process. • Environment Regulator reports to a Minister responsible for its administration - Regulator makes recommendations to Minister on licence approvals • OTTER, EPA and Dept. of Health can be in conflict with administering their Acts and in setting objectives.	
<i>Regulatory decision making processes</i>	• Judicial review of decision-making is available • The Regulator generally seeks inputs and consultation with other agencies, with established procedures and mechanisms for engagement with regulated entities and other stakeholders. • The Regulator does not regularly seek feedback to mitigate costs and inefficiencies • Annual reporting and reporting monthly via centralised electronic databases and submissions to which licensed entities and activities submit data.	• Robust decision making tools are not necessarily in place and there is often inconsistency in application and outcomes across regions – thereby limiting capacity to meet best practice.
<i>Instruments or form of regulation</i>	• Definition and control approach to implementation of regulation where penalties are applied • For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific, however there is a State Policy • Regulator takes some risk-based approaches, but generally operates as definition and control	• Regulator takes some risk-based approaches, but generally operates as definition and control thereby meeting

	Current state of play	Assessment against minimum standards & best practice regulation
	• Compliance seeks to mitigate the risk of non-compliance and poor environmental outcomes. • There is a comprehensive approach to monitoring of water, waste, noise, air, odour and other environmental attributes where appropriate (including development of index of waterway condition), although does not necessarily adapt quickly to changing technologies and techniques – in accordance with PEVs • Setting explicit licence conditions for point source discharges • Regional objectives or jurisdictional water quality based plans prepared • Data analytics not heavily deployed	minimum standard but not best practice.
Public health regulation		
<i>Governance arrangements</i>	• The Director of Public Health is responsible for the protection of public health for water and sewerage under the <i>Public Health Act 1997</i> (which includes the ADWG). • The Public health regulations for recycled water is guided by the EPA Tasmania Environmental Guidelines for the Use of Recycled Water Tasmania, 2002. Specific requirements for managing and controlling water so as it does not pose a risk to public health are outlined for each of the following: ◦ The Regulated Entity – TasWater ◦ Private Water Suppliers ◦ Commercial Water Carriers ◦ Agencies and Public Authorities • The Regulator has deterministic powers and retains a core mission and clearly stated objectives and principles	• Independent regulator with powers to determine public health outcomes, with some reference to the ADWG and AGWR meeting minimum standard. • Conflicts can occur across agencies and between State and Local government and as such falls short of best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
	- Health Regulator reports to a Minister responsible for its administration- Regulator makes recommendations to Minister on licence approvals - Under the Department of Primary Industries, Water and Environment a Wastewater Reuse Coordinating Group has been established to foster a whole of government approach to the re-use of wastewater from wastewater treatment plants (subject to EPA approval). - TasWater works with councils and state government agencies to ensure compliance to the Public Health Act 1997, including monitoring and managing the performance of all sewage treatment plants and ambient monitoring programs to better manage possible impacts of effluent discharges. - On-site wastewater management, including greywater treatment systems, requires approval from the Minister for Justice and Workplace Relations and consent from the Council's Environmental Health Officer. - Several Departments and Ministers are responsible for water quality health leading to conflict and communication issues (e.g. OTTER, EPA and Dept. Health can be in conflict with administering their Acts and in setting objectives and compliance outcomes)	
<i>Regulatory decision making processes</i>	- The Regulator undertakes a generally transparent process, with all audit and compliance monitoring publicly available (including clear specification of the rationale underlying any regulatory decisions) - Regulator seeks and provides opportunities for stakeholders to provide input to regulatory decision-making (making information available on process, inviting submissions, hosting public forums etc.). - Formal interaction with other relevant agencies exists - Regulator recognises interaction between different regulator's decision-making and generally seeks input and consultation with other agencies. - The Regulator does not regularly seek feedback to mitigate costs and inefficiencies - Judicial review of decision-making is available	The Regulator does not regularly seek feedback to mitigate costs and inefficiencies thereby not providing for best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
<i>Instruments or form of regulation</i>	• Each year water suppliers submit a report to the Director of Public Health detailing monitoring and management activities. • The Regulator places a strong emphasis on water quality and health outcomes • Definition and control approach to implementation of regulation where penalties are applied • Monitoring of compliance and annual reporting, or other frequency as deemed appropriate • Regulator takes some risk-based approaches, but generally operates as definition and control • Water quality plans developed, monitored, updated and maintained (in accordance with ADWG or recycled water local guidance) and sent to Health regulator on a jurisdiction basis • Discharge licences that clearly specifies the obligations and performance targets imposed on the water service providers, adopts a risk-based approach, and is subject to annual review • Incentive scheme are not clear nor considered • Service standards are a component of audit, but do not necessarily align with public health requirements directly	• Clearly specified objectives are outlined and are risk-based to a high degree which is moving towards best practice.

Source: Frontier Economics and Arup

Australian Capital Territory

Table 19: Assessment of economic, environmental and public health regulation of the urban water sector in Australian Capital Territory

	Current state of play	Assessment against minimum standards & best practice regulation
Economic regulation		
<i>Governance arrangements</i>	- In accordance with the functions of the Independent Competition and Regulatory Commission (ICRC) within Section 8 of the Act, the ICRC is responsible for the provision of price directions for regulated industries. - ICRC is also responsible for licensing of water utility services and associated compliance functions.	Meets both minimum standards and best practice as is independent regulator with a core mission, deterministic powers to set prices and clearly specified objectives, operating under its own Act.
<i>Regulatory decision making processes</i>	- The ICRC undertakes a detailed, transparent public review—with opportunities for external consultation) to determine maximum prices and operating licences to apply for the urban water authorities - ICRC seeks feedback on and reviews their broad approaches to regulation - Regulator recognises interaction between different government organisations when setting prices.	Meets minimum standards as the Regulator generally seeks input and consultation with stakeholders and regulated entities, but

	Current state of play	Assessment against minimum standards & best practice regulation
		has not yet adopted best practice consultation techniques emerging elsewhere.
<i>Instruments or form of regulation</i>	• Considers appropriate mechanisms to ensure the recovery of the prudent and efficient costs of Icon Water during the regulatory period, while minimising the potential for significant price fluctuations. • Considers the potential for implementing incentive schemes for service levels, operating expenditure or capital expenditure for Icon Water in the future. • Has regard to efficiency, environmental and social considerations when setting prices. • Regulator moved from individual price cap form of control to a hybrid price and revenue cap form of control that included elements of both a revenue cap and individual price caps for water and sewerage charges. • Regulator makes some use of standard risk sharing mechanisms such as cost-pass through (to provide manage material changes in non-controllable costs over the period) and price variation trigger mechanism (to deal with any major unforeseen event (subject to meeting a materiality threshold)).	• Meets minimum standards but falls short of best practice
Environmental regulation		
<i>Governance arrangements</i>	• The EPA is an independent regulator with a core mission, deterministic powers to set environmental outcomes and specified objectives operating under the <i>Environmental Protection Act 1997 (the Act)</i>. As a statutory position, the EPA is responsible for the administration of the Act. • The EPA's administrative functions include meeting objectives to protect and enhance the quality of the environment, prevent environmental degradation and risk of harm to human health, provide for the monitoring and reporting of environmental quality on a regular basis (including reporting to a Minister responsible for its	• The Regulator has deterministic powers and retains a core mission and clearly stated objectives

	Current state of play	Assessment against minimum standards & best practice regulation
	administration), achieve effective integration of environmental, economic and social considerations in decision-making processes and establish a process for investigating and, where appropriate, remediating land areas where contamination is causing or is likely a significant risk to human health or the environment. - The ACT EPA is also responsible for the administration of the Water Resources Act 2007 (the WR Act). The WR Act aims to ensure the use and management of the Territory's water resources are sustainable while protecting the ecosystems that depend on the waterways. It is also designed to protect waterways and aquifers from damage. - The management and protection of the Australian Capital Territory's water resources is a key priority of the ACT Government. As the largest population centre in the Basin, the ACT will continue to be an active and responsible participant in managing the precious and finite water resources of the Murray-Darling Basin. - The Environment and Planning Directorate has several roles in managing water in the ACT. This includes responsibility for high-level strategic water policy development, with the national water reform agenda and national competition issues relating to water access, pricing and trading. In addition, the Directorate regulates the Territory's water resources, monitors and reports on water quality in the ACT. The Directorate also has a role in the demand management of water resources to ensure water is available and water is used wisely. - The ACT Water Strategy 2014-44: Striking the Balance (ACT Water Strategy) details the Government's vision for water management in the ACT over the next 30 years. - ICRC, EPA and Dept. Health can be in conflict with administering their Acts and in setting objectives	which meets a best practice standard. - Environment Regulator reports to a Minister responsible for its administration - Regulator makes recommendations to Minister on licence approvals. - The environmental parameters and coverage and not deemed to be holistic and therefore impacts ability to meet best practice.
<i>Regulatory decision making processes</i>	- Judicial review of decision-making is available - The Regulator generally seeks inputs and consultation with other agencies - Regulator operates as definition and control - The Regulator does not regularly seek feedback to mitigate costs and inefficiencies	Robust decision making tools are not necessarily in place and there is often inconsistency in application and

	Current state of play	Assessment against minimum standards & best practice regulation
	- Procedures and mechanisms for engagement with regulated entities and other stakeholders undertake - Annual reporting and reporting monthly via electronic databases and submissions	outcomes across regions thereby not meeting best practice.
<i>Instruments or form of regulation</i>	- Definition and control approach to implementation of regulation where penalties are applied - For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific - Setting explicit licence conditions for point source discharges- the license is subject to regular review and licence can make cases for change - Regional objectives or jurisdictional water quality based plans prepared - Localised objectives for environmental catchment based outcomes are often determined - Risk-based approach at times deployed but not consistently - Offsets and market based approaches not used - There is a comprehensive approach to monitoring water, waste, noise, air, odour and other environmental attributes where appropriate (e.g. the surveillance of health of catchments and waterways and development of index of waterway condition), although does not necessarily adapt quickly to changing technologies and techniques - Centralised databases to which licensed entities and activities submit data, however, data analytics not heavily deployed. In addition, there is a strong cross border monitoring program and sharing of data and alignment of models can be limited. - Compliance auditing seeks to mitigate the risk of non-compliance and poor environmental outcomes - Limiting burden on compliance and monitoring is not well developed	For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific and therefore meets minimum standard but not best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
Public health regulation		
Governance arrangements	- The ACT Health Department monitors public health as defined in the <i>Public Health Act 1997 and the Utilities Act 2000</i>. ACT Health has powers in relation to public health risk posed by sewage, the presence of unsanitary conditions and the protection of Canberra's water supply by utilities. - There is only one utility provider in the ACT - Key legislation includes: - The <i>ACT Public Health Drinking Water Code of Practice 2007</i> (DWCoP) provides a framework for reporting and water quality management relating to the supply of drinking water. It specifies water quality requirements according to the ADWG (e.g. operators of drinking water systems are required to obtain a Drinking Water Utility licence) - The ACT Health departments are involved in the approval of wastewater reuse systems as per the EPA guidelines- <i>ACT Environment and Health Wastewater Reuse Guidelines 1997</i>. - Sewerage effluent is managed under the EPA ACT's <i>Water Quality Environment Protection Policy, 2008 and the Environmental Protections Act 1997</i>. - A licence is also required to provide water utility services under the <i>Utilities Act 2000</i> unless specifically exempt. - Under the <i>Public Health Act 1997</i> sewerage systems (including on-site waste management systems) require approval from ACT Health in unsewered areas. - Health Regulator reports to a Minister responsible for its administration- Regulator makes recommendations to Environment Minister on licence approvals	Independent regulator with powers to determine public health outcomes, with some reference to the ADWG and AGWR although not strong and not in all settings and as such falls short of best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
	The Regulator has deterministic powers and retains a core mission and clearly stated objectives and principles.	
<i>Regulatory decision making processes</i>	- The Regulator undertakes a generally transparent process, with all audit and compliance monitoring publicly available (including clear specification of the rationale underlying any regulatory decisions) - Regulator recognises interaction between different regulator's decision-making, and generally seeks input and consultation with other agencies. - The Regulator does not regularly seek feedback to mitigate costs and inefficiencies - Monitoring of compliance and annual reporting, or other frequency as deemed appropriate - Numerous surrounding Federal and State / Local government within Territory and cross-border agencies and drivers result in conflict.	Several Departments and Ministers are responsible for water quality health leading to conflict and communication issues (e.g. ICRC, EPA and Health can be in conflict with administering their Acts and in setting objectives and compliance outcomes). This is further complicated with National Capital Authority role over Lake Burley Griffin and the cross-border Murray Darling Basin aspects, and catchments with surrounding local councils. These compounding

	Current state of play	Assessment against minimum standards & best practice regulation
		elements mean best practice is difficult to attain.
<i>Instruments or form of regulation</i>	• The Regulator places a strong emphasis on water quality and health outcomes, with a strong emphasis on price • For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific. This is keeping with the ADWG and recycled water follows local guidelines • Definition and control approach to implementation of regulation where penalties are applied • Incentive scheme are not clear nor considered • Service standards are a component of audit, but do not necessarily align with public health requirements directly • Operating licences that clearly specifies the obligations and performance targets imposed on the water service providers, adopts a risk-based approach, and is subject to annual review • The utility must produce and make public an annual report on its drinking water quality monitoring program.	• Clearly specified objectives are outlined and are risk-based to a high degree although predominantly for one part of the water cycle and entity constrained to the monopoly water company and as such falls short of best practice.

Source: Frontier Economics and Arup

Northern Territory

Table 20: Assessment of economic, environmental and public health regulation of the urban water sector in the Northern Territory

	Current state of play	Assessment against minimum standards & best practice regulation
Economic regulation		
<i>Governance arrangements</i>	- In the Northern Territory, the Utilities Commission regulates the energy sector, but its role in the water and sewerage industry is confined mainly to licensing. - The Utilities Commission has no direct role in regulating water prices as water and sewerage service prices are regulated directly by the Regulatory Minister via a Water and Sewerage Pricing Order (WSPO). The Commission's role is to monitor and enforce the Order. - However, the Minister may assign some price and service standard monitoring functions to the Commission under his regulation powers. - Under the Utilities Commission Regulations, the Commission is authorised to make a code relating to Ring-fencing in a regulated industry. However, to date, the Commission has not promulgated a ring-fencing code for the Water Supply and Sewerage Services Industries	Does not meet minimum standards as regulator does not have an independent role in price setting.
<i>Regulatory decision making processes</i>	Commission does not conduct public inquiries into pricing but does engage with PWC and other stakeholders about possible changes to licences and licensing arrangements.	Meets minimum standards with regards to licensing but UC does not undertake public price reviews.
<i>Instruments or form of regulation</i>	Does not regulate prices but administers and enforces licences	Meets minimum standards with regards to licensing but does not directly regulate prices.

	Current state of play	Assessment against minimum standards & best practice regulation
Environmental regulation		
<i>Governance arrangements</i>	- The Northern Territory Environment Protection Authority (NT EPA) as an independent authority has the ability to develop and provide publications on a broad range of matters. This is acted via environmental impact assessments, guidelines, waste, pollution, air, contaminated land and compliance (including impacts on waterways). The NT EPA has regulatory responsibilities under the following legislation and statutory instruments: ◦ <i>Environmental Assessment Act</i> ◦ <i>Environmental Assessment Administrative Procedures</i> ◦ <i>Environment Protection (National Pollutant Inventory) Objective</i> ◦ <i>Waste Management and Pollution Control Act</i> - Environment Regulator reports to a Minister responsible for its administration - regulator makes recommendations to Minister on licence approvals - The NT Environment and Natural Resources Department brings together functions that foster and protect environmental aspects. This includes flora, fauna, water resources, water data and the environment. - The Water Resources Division has been set up to implement the primary piece of water resource legislation, the <i>Northern Territory Water Act</i> (2016), which provides for the investigation, allocation, use, control, protection, management and administration of water resources, and for related purposes. - Several Departments and Ministers are responsible for the environment leading to conflict and communication issues (e.g. WSPO, EPA and DHCS can be in conflict with administering their Acts and in setting objectives)	- Independent regulator with powers to set environmental outcomes and specified objectives and principles, operating under its own Act/s as required for minimum standard. - However, several Department and Ministers are responsible for the environment, leading to potential conflict and communication issues thereby falling short of best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
<i>Regulatory decision making processes</i>	- The Regulator does not regularly seek feedback to mitigate costs and inefficiencies - Judicial review of decision-making is available	Robust decision making tools are not necessarily in place and there is often inconsistency in application and outcomes across regions meaning best practice is not achieved.
<i>Instruments or form of regulation</i>	- For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific - Regulator operates as definition and control - Surveillance of health of catchments and waterways and development of index of waterway condition - Centralised databases to which licensed entities and activities submit data - Data analytics not deployed - Compliance seeks to mitigate the risk of non-compliance and poor environmental outcomes - Setting explicit licence conditions for point source discharges - Risk-based approaches not deployed - Offsets and market based approaches not used - The License is subject to review - Localised objectives for environmental catchment based outcomes are not determined - Limiting burden on compliance and monitoring is not well developed	For the most part, regulation and compliance is set to determined compliance rather than outcome based and catchment / setting specific and therefore meets minimum standard but not best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
Public health regulation		
Governance arrangements	- Health Regulator not in place for urban water, is via Environment Minister. The regulator makes recommendations to the Environment Minister on licence approvals. - Key legislation includes: - The <i>Water Supply and Sewerage Services Act 2000</i> (NT) outlines the requirements for the provision of drinking water and sewerage services and requires Power and Water Corp (the bulk water supplier in NT) to provide safe drinking water. - The <i>Sewerage Services Act</i> regulates sewerage services in the NT. - On site wastewater management and recycled water is legislated under the <i>Public Health Act 2005</i> and requires approval from the DHCS (and in some cases the EPA). - The DHCS regulates the sewerage treatment plants as per the <i>Code of Practice for Small On-Site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent, 2014</i>. - The ADWG is the primary reference on drinking water used by Power Corp and the DHCS. - The Environment Regulator has deterministic powers and has a core mission and clearly stated objectives - Several government agencies are also involved in the delivery of safe drinking water (including the Department of Health and Community Services (DHCS)) and for water quality health more broadly, leading to conflict and communication issues (e.g. WSPO, EPA and DHCS can be in conflict with administering their Acts and in setting objectives and compliance outcomes).	- Health Regulator not in place for urban water, is via Environment Minister and therefore does not meet minimum standard. - Independent regulator (environment) with clearly specified objectives and principles, and powers to determine public health outcomes (with some reference to the ADWG and AGWR) although not strong and full in coverage and therefore not representing best practice. - Several Departments and Ministers are responsible for water quality health leading to conflict and communication issues and therefore not representing best practice.

	Current state of play	Assessment against minimum standards & best practice regulation
<i>Regulatory decision making processes</i>	• The Regulator undertakes a generally transparent process, with all audit and compliance monitoring publicly available – however is self-assessment only and not via independent auditors • Regulator recognises interaction between different regulator's decision-making • Judicial review of decision-making is available • The Regulator does not regularly seek feedback to mitigate costs and inefficiencies • Water Quality Plans and Reports are publicly available	• Regulator recognises interaction between different regulator's decision-making to some extent meeting minimum standard.
<i>Instruments or form of regulation</i>	• The Environment Regulator places an emphasis on water quality outcomes • Definition and control approach to implementation of regulation where penalties are applied • Discharge licences that clearly specifies the obligations and performance targets imposed on the water service providers • Water quality plans are not required specifically, however Power and Water have a Plan in accordance with ADWG or recycled water local guidance) • Incentive scheme are not clear nor considered • Sophisticated monitoring and treatment processes ensure that the drinking water meets very high standards. • Monitoring of compliance and annual reporting, or other frequency as deemed appropriate	• Definition and control approach to implementation of regulation where penalties are applied and therefore meeting minimum but not best practice.

Source: Frontier Economics and Arup

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