Report prepared for the South Australian Council of Social Service

Basic Level of Service: Settings for long-term water security in remote South Australia

A literature review and brief analysis to address relevant issues

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Abbreviations

AADD	Annual Average Daily Demand
ACMA	Australian Communications and Media Authority
ACT	Australian Capital Territory
ADWG	Australian Drinking Water Guidelines
AIRA	Australian Index of Remote Areas
AADD	Annual Average Daily Demand
BOM	Bureau of Meteorology
CAT	Centre for Appropriate Technology
CDEP	Community Development Employment Program
CLC	Central Land Council
CTG	Closing the Gap
COAG	Council of Australian Governments
CSG	Customer Service Guarantee
CSO	Community Service Obligation
DEW	Department of Environment and Water (SA)
DFAT	Department of Foreign Affairs and Trade
DPIE	Department of Planning, Industry & Environment
EMSUP	Essential Municipal Services Upgrade program
ERA	Essential Remote
ESC	Essential Services Commission (Vic)
ESO	Essential Services Office
ESCOSA	Essential Services Commission of South Australia
EMSUP	Essential and Municipal Services Upgrade Program
GSL	Guaranteed Level of Service
GST	Goods and Service Tax
GWMWater	Grampians, Wimmera and Mallee region
ITRDC	Department of Infrastructure, Transport, Regional Development and Communications
ICRC	Independent Competition and Regulatory Commission
IES	Indigenous Essential Services
LOS	Level of Service
NBN	National Broadband Network
NFP	Not for Profit
NTLC	Northern Territory Land Council
Mbps	Megabits per second
MBSP	Mobile Black Spots Program
MUNS	Municipal
NSW	New South Wales
NT	Northern Territory
NWI	National Water Initiative
OECD	Organisation of Economic Cooperation and Development
PC	Productivity Commission
PCWA	Placer County Water Authority
Qld	Queensland

RBS	Regional Broadcasting Service
REMS	Remote Essential Municipal Services
RSP	Regional Service Providers
RTR	Remote Telecommunications Review
SA	South Australia
SACOSS	South Australian Council of Social Services
SDG	Sustainable Development Goals
SEQ	Southeast Queensland
SIP	Statutory Infrastructure Provider
SoE	Statement of Expectations
STED	Septic Tank Effluent Disposal
STS	Standard Telephone Service
SWP	Source Water Protection
UN-SDG	United Nations Sustainable Development Goals
UN-OHCHR	Office of the High Commissioner for Human Rights
USO	Universal Service Obligation
USG	Universal Service Guarantee
Vic	Victoria
VTA	Verified Trust and Accountability
WA	Western Australia
WSP	Water Safety Plan
WSP	Water Service Providers (WSPs)
WHO	World Health Organisation

Executive Summary

The provision of a safe and reliable water supply in regional and remote areas of Australia is both complex and costly. Given the federated nature of the country and the distances involved, service delivery also varies significantly both across and between jurisdictions. Notwithstanding the challenges involved, many Commonwealth- and State-based entities continue to advocate for the goal of providing a reliable, healthy and safe water supply to the entire population, regardless of their place of habitation and life circumstances.

This notion of access for all to safe and reliable water provision is not unique to Australia. It is a fundamental tenet of the United Nations' Sustainable Development Goals (UN-SDGs), and the UN Office of the High Commissioner for Human Rights (UN-OHCHR) approaches 'human rights to water'; both documents to which Australia is a signatory. While Australia has committed to the 17 Sustainable Development Goals (SDGs) goals under the UN's 2030 Agenda, these goals are not being fully realised in all parts of Australia under current policy settings.

South Australia has an opportunity to be the leading jurisdiction in progressing the Productivity Commission's National Water Initiative recommendation to develop a definition of, and ensure access to, a basic level of water services for all Australians, which would include as a minimum, access to safe and reliable drinking water.

Minimum/basic levels of service for water security are not clearly or consistently defined in other jurisdictions and there is no single model for a basic level of service of water services in other jurisdictions, nationally or internationally, or in other sectors which are readily transferrable to the South Australian context.

The South East Queensland Level of Service (LoS) guidelines are likely the closest to what might be achievable in South Australia – however for small supplies, South Australia could consider using approaches of the Tasmanian Government regarding engagement and pricing.

The UN's Office of the High Commissioner for Human Rights (OHCHR) provides a viable framework for approaching the provision of a basic level of safe and reliable drinking water from a human rights perspective. This approach would:

- Enable provision of water services that are available, safe, acceptable, accessible and affordable for all communities in SA regardless of their physical location
- Foreground the principles of core obligations, progressive improvement and the use of maximum available resources to be considered in determining not only the sustainability of water services but their ability to deliver on the most basic needs of all individuals
- Provide a means for South Australia to redress past disadvantage and consider how we move beyond a "minimum" standard for unserved or underserved groups and take positive measures to address structural causes of inequality
- Bring a different paradigm to discussions with the water sector; making the provision of safe drinking water not something simply to be desired for all, but as a legal

entitlement, and importantly putting individuals and societies rather than economies at the centre of the debate.

While States and Territories will need to set their own levels of service for water security according to local contexts, the Federal Government has an important role to play in supporting and enforcing various requirements. For example, a national drinking water quality database would assist to highlight the ongoing discrepancy between Australian Drinking Water Guidelines and the non-compliance which is heavily skewed to remote areas and particularly to Indigenous communities and often goes unreported. Such a database could guide government investment in programs and processes across Australia and would act as a continual yardstick to measure incremental progressive improvement.

Background

Addressing the provision of safe and reliable water supplies for people in regional, rural and remote Australia is a confronting task. The challenging cost of infrastructure, covering vast distances between towns, harsh and extreme climates and low population numbers with skill shortages across the technical and managerial domains, all make service provision difficult. Added to this there is no standardised approach to providing essential services in remote regions across the six states and two territories. As the Productivity Commission notes (Australian Government, 2021), the situation in each jurisdiction differs, with 287 utility providers of varying size and capacity. In Victoria (Vic), South Australia (SA), Western Australia (WA) the major utility provider is a state government entity, in New South Wales (NSW) and Queensland (Qld) local governments take responsibility for water supplies, while in Tasmania (Tas) the major supplier is a collaboration between 29 local councils and the state government. While there is nationwide adherence to the Australian Drinking Water Guidelines (Australian Government, 2011), each state or territory has additional legislation, guides or plans that make a standardised approach difficult to achieve. Table 1 (Australian Government, 2021) outlines the number of utilities by state and the economic regulation provisions. See Table 1 below which outlines Regional potable water and wastewater providers (Australian Government, 2021, p. 7).

Table 1 Regional potable water and wastewater providers. Excludes bulk water providers and self-supply schemes

Jurisdiction	*Number of utilities*	*Providers by number of connections*			*Role of economic regulator in regional areas*	*Ownership in regional areas*
	Total	*> 100k*	*10k - 100k*	*< 10k*		
NSW	92	1	27	64	Large providers licensed; others unregulated	Varies between State and local govts
Vic	13[b]	1	12[b]		Price setting	State Government
Qld	71	2	17	52	Large providers subject to monitoring, others unregulated	Varies between State and local govts
SA	67	1		66	Licensing, benchmarking and price determinations	Varies between State and local govts
WA	36	1	3	32[c]	Licensing and benchmarking, some local governments exempt. Water Corporation subject to price monitoring	Varies between State and local govts
Tas	1	1			Revenue setting	Co-owned by the State and local govts
NT[a]	1		1		Licensing	Territory Government
ACT	1	1			Price setting	Territory Government

[a] Includes Indigenous Essential Services, a subsidiary of the Power and Water Corporation. [b] From 1 July 2021, Western Water (approximately 75 000 connections) will merge with City West Water, reducing the number of regional utilities with 10 000–100 000 connections to 11 and the total number of regional utilities to 12. [c] Includes 16 licensed potable water and/or wastewater providers and 16 local governments exempt from licensing.

In SA, the 2022 Water Security Statement: water for sustainable growth (South Australian Government & Department of Environment and Water, 2022) outlined its ten state-level strategic priorities for the current 4-year period to 2024. Among these priorities, the notion of water as a critical human need (South Australian Government & Department of Environment and Water, 2022, p. 1) is highlighted as a *key priority* (p2) and the document identifies the relevant legislation and responsibilities in relation to the provision of water security services across the state (South Australian Government & Department of Environment and Water, 2022, pp. 5, fig 1). Six entities are identified as having critical roles in the provision of water security in the state: ESCOSA; SA Water; Health SA; EPA, DEW and Landscape Boards. In SA, ESCOSA was established under the Essential Services Commission Act 2002 as a regulator of certain essential services (including water) to ensure the protection

of interests of SA residents with regard to pricing, quality and reliability of those essential services (Essential Services Commission, 2022). ESCOSA has recently amended its approach to licensing to require licensees to self-audit in respect of their operations and report their findings to the Commission annually under the Water Industry Act (2012) (SA). The Commission has implemented a 'verified trust and accountability' (VTA) regulatory approach for small-scale network licensees. In accordance, each small-scale network licensee has been assessed and determined by the Commission to be either a Category A licensee or Category B licensee in accordance with the Licensee Categorisation Methodology (Essential Services Commission, 2022). A licensee's current categorisation as Category A or Category B licensee under the Licensee Categorisation Methodology then determines its level of reporting requirements. The list of reporting requirements for Category A includes details of customer numbers and connections, including under various concessions, as well as compliance issues and material breaches. Those in category B are required to provide *additional* information beyond the Category A list which can include 'any additional specific reporting obligations determined by the Commission' (p5).

The challenge of consistently supplying water to remote communities in SA is identified in the 2022 water security statement, with a range of regulated and unregulated supply arrangements depending on location and season (South Australian Government, 2021). In the north of the state there are approximately 64 remote communities varying in size from 4 to 4000 people but totalling almost 10,000 people (South Australian Government & Department of Environment and Water, 2022, p. 33). Most commonly water is supplied from treated groundwater, access to mains pipeline or from rainwater tanks. Over the 2020-2024 regulatory period, the SA Government will invest $41 Million in remote community upgrades. This will include providing potable supply to regional areas of Yunta, Oodnadatta, Maree, Terowie, Marla and Manna Hill. These supplies will service nearly 350 additional properties. An additional $7.9 Million will maintain and upgrade supplies to Indigenous communities (South Australian Government & Department of Environment and Water, 2022, p. 34). Self-supplied communities will continue to be subsidised with emergency water carting in exceptional circumstances when potable supply is at risk. DEW will also carry out a water security audit and risk assessment for both short and long term risks to allow the 'development of a basic level of safe and reliable service for all self-supplied remote communities' (South Australian Government & Department of Environment and Water, 2022, p. 34).

The review of water security statement for next 4 year period (2024-2028) continues to identify the provision of critical human water needs within its top 10 priorities in addition to climate change which will undoubtedly impact on water availability as well as quality and safety (South Australian Government, 2021, pp. 48-49).

Purpose and scope of this report

The South Australian Council of Social Service (SACOSS) engaged the authors to undertake a rapid literature review to inform approaches and considerations for setting a basic level of service for safe and reliable drinking water to address a long-standing issue of some communities in South Australia not having adequate access to safe and reliable drinking water.

This follows the SA State Government's commitment to develop a standard for a basic level of safe and reliable drinking water for self-supplied remote communities by 2022, as part of the State Government's Implementation Plan for the National Agreement on Closing the Gap (South Australian Government & Aboriginal Affairs and Reconciliation, 2020, p. 71). The commitment follows the Productivity Commission recommendation that State and Territory Governments should commit to defining and ensuring access to a basic level of water service for all Australians, including safe and reliable drinking water (Productivity Commission Inquiry Report, 2021, p. 15). The Productivity Commission (PC) has given limited guidance on how a basic level of service would be set, suggesting that at a minimum the definitions of 'safe' and 'reliable' would necessarily be a government decision. It is suggested that the definition of 'safe' should be aligned with the Australian Drinking Water Guidelines (ADWG) parameters for health-based performance, and that minimum standards should take into regard the quantity of water available, the frequency of water restrictions, and/or clear arrangements to maintain services during extreme events (Australian Government, 2021). The PC's recommendation is that where feasible, user charges for this supplied water should be reflected in the final costs paid by consumers, however in some regional and remote areas, the costs of service delivery would preclude this approach and, in these instances, operational subsidies should be provided as transparent CSO payments.

Methodologies/ Approaches

The search strategy was conducted across four domains: grey literature; peer review publications; interviews with key stakeholders; and searches of relevant websites/homepages. Searches of relevant websites and homepages was usually done following interviews with key stakeholders.

Review of grey literature

The search for grey literature was performed on Advanced Google using similar phrases as performed for the peer reviewed literature, but with fewer terms entered in the search string. The file type was limited to .gov, .au & .org. Only the first 10 pages of each list were searched. All searches were restricted to the period 2011 to 2022.

Review of peer literature

Peer reviewed publications were retrieved from *ProQuest* and *Scopus* following consultation with a senior librarian at Flinders University to ensure relevant terms or phrases were used. The standard procedures for systematic literature reviews were followed.

Interviews with key stakeholders/ Home Page Searches

The majority of leads came from interviews with key informants across all states and territories. This was done through a snowball process and invariably led to identification of further relevant materials which were analysed and are cited as appropriate. Several organisational home pages were also searched as a result of these interviews. A key word search was done using the navigation menu on each homepage. This was a less systematic approach than for peer reviewed literature given that many organisational home pages differ in structure and the arrangement of content. The interviews have been used where relevant as the source of key information in a number of case studies throughout the report, for example interviews conducted with key stakeholders from the Essential Services Commission (ESC) (Victoria) and Coliban Water provided material for the case study on rural Victoria.

A more detailed account of the search strategy can be found in Appendix A.

Results

The table below identifies definitions of basic level of service across various jurisdictions in Australia, summarises where similar concepts exist and highlights relevant policy processes.

Table 2 Jurisdictional definitions of basic level of service

Jurisdiction	*Defined Basic level of Service for long-term water security?*	*Similar concepts*	*Relevant policy processes*
NSW	Not clearly or consistently defined	Critical Needs	Water supply (critical needs) Act (NSW Government, 2019)
Vic	Not formally stated but does have guidelines on *agreed level of service* and *minimum level of service* for urban customers Rural customers 'reliable level of service	*Safe water* - water that meets quality standards specified by the regulations, as defined by Victorian Safe Drinking Water Act (2003). *Regulated water* - water that is not intended for drinking but could be easily mistaken as drinking water Guaranteed Service Level (GSL)	Safe Drinking Water Act (Chief Parlimentary Council, 2003 and 2019) Guidelines for the development of urban water strategies (Victoria State Government, 2021). (Essential Service Commision Victoria, 2020) (Coliban Water, 2018)
Qld	Water Security Level of Service objectives legislated in Southeast QLD Non-mandated objectives for other regional service providers		Level of Service Objective: guidelines for development (Queensland Government & Department of Natural Resources Mines and Energy, 2018) Water Security Program Guidelines Southeast Queensland (Department of Regional Development, 2021)
SA	Not formally stated	Potable water? Non-potable water? Critical human water needs?	As part of the State Government's Implementation Plan for the National Agreement on Closing the Gap (South Australian Government & Aboriginal Affairs and Reconciliation, 2020) there has been a commitment to develop a standard for a basic level of safe and reliable drinking water for self-supplied remote communities by 2022
WA	2021 Auditor General's Report identified a *basic level of service* as regular testing of potable water, rapid response to faults, reporting on testing to the community, and up-grade of	Non-standard water service (Water corporation)	Minimum level of service for remote communities (Government of Western Australia Department of Housing, 2014). WA Govt in process of transferring of essential water supplies to the Water Corporation to work towards provision of a level of service for

Jurisdiction	*Defined Basic level of Service for long-term water security?*	*Similar concepts*	*Relevant policy processes*
	infrastructure. Chemical parameters such as taste, and smell are not considered part of a basic level of service.		Aboriginal communities that is equivalent to that of a town of similar size that has a regulated water supply
Tas	Water provided by TasWater is potable, non-potable water or limited water quality. There are three categories of 'limited' water quality customers- those experiencing low pressure, those whose water is contaminated by microbiological or chemical agents and those whose water is not potable (TasWater, 2022b).	Potable water and limited water supply.	
NT	Not formally stated		Northern Territory Strategic Directions Water Plan (Northern Territory Government, 2020)
ACT	Not formally stated		

Responsibility for funding and operations of regional and remote water supplies differs across the six states and two territories. Across SA, WA, Tas, ACT and NT, one provider is responsible for remote and regional water services, although there are some variations to these arrangements. In SA and WA for example, some smaller utility providers are licensed to provide services, particularly in regional towns, and many of the maintenance and surveillance operations may be outsourced to private providers creating complexities that are difficult for customers to navigate (Australian Government, 2021; Northern Territory Government, 2022c). In SA, there are a total of 68 licensed water industry entities regulated by the Water Industry Act 2012 which provide both drinking water and non-potable water to SA customers; by far the largest of these is SA Water which has the longest mains supply network of all water utilities in Australia at more than 27,000 Kms (South Australian Government & Department of Environment and Water, 2022, p. 31).

In the ACT, Icon Water provides water services to Canberra and non-potable water to a small number of surrounding villages. Interviews with stakeholders indicated there are no immediate plans to up-grade these villages to potable supplies (ACT Government Environment and Planning, 2014; Icon Water, 2022). In NSW and Qld, water supply tends to be the responsibility of local governments. There may be plans for individual local providers to extend services to smaller communities, but this is not evident from the literature (Unitywater, 2019, 2020-2021, 2021).

In Victoria, prior to the early 1980's, water and wastewater services were managed by local councils, involving around 400 water boards and trusts. In 1982, the state Liberal government

formed these services into 13 regional water corporations (Australian Government, 2021). In 1999, Victoria's Auditor General undertook an audit of the state's water corporations, finding that they were not delivering adequate services to their customers. This resulted in a range of further reforms, including the creation of the Victorian Safe Drinking Water Act in 2003 (Chief Parlimentary Council, 2003 and 2019).

A second reform was the establishment of the Essential Services Commission with the brief of providing economic regulation of the sector (Chief Parlimentary Council, 2003 and 2019; Essential Service Commision Victoria, 2022). The Victorian Safe Drinking Water Act (2003) ('the Act') requires that all Water Corporations providing water to towns ensure it is safe to drink with a minimum acceptable standard established for small townships. The Act is administered by Victoria's Department of Health as the health regulator, who also recognise that in some cases the water may not be potable (Chief Parlimentary Council, 2003 and 2019). This is particularly the case in rural Victoria for small towns or those some distance from major pipelines.

Non-potable water means water that is the subject of a declaration made by the Minister under section 6 of the Safe Water Drinking Act 2003, known under that Act as 'regulated water'. Water Corporations delivering regulated water are required to ensure that their customers are fully aware that the supply is not safe to drink (Chief Parlimentary Council, 2003 and 2019). Prices are set by the economic regulator for Victoria – the Essential Services Commission (ESC) (Coliban Water, 2020-2021; Essential Service Commision Victoria, 2018). The ESC requires water corporations to produce a customer charter that sets out the service standards that the Corporation agrees to deliver to its customers. One of the service standard for rural providers is for "Unavailability of supply systems for continuous periods in excess of 72 hours" (Essential Service Commision Victoria, 2020, p. 23). Under these circumstances GWMWater agrees to cart non-potable water to homesteads for any interruptions that exceeds 72 hours, at no cost to the customer. It should be noted that this customer service standard is different to the water security of supply standards which are the key focus of this report. Approximately 97% of Victorians have access to either a safe or regulated water service with only 3% self-managing their water supplies (Department of Health and Human Services, 2015).

Caravan Parks throughout Australia are also required to provide safe drinking water to tourists and residents. Those parks in remote areas outside town boundaries may be required to provide this making them self-supplied. There is requirement under federal Residential Tenancies legislation, that these parks install a treatment plant capable of providing potable water which is safe for human consumption in accordance with the Australian Drinking Water Guidelines (ADWG), for all visitors to each caravan site at all times (Chief Parlimentary Council, 2020). Failure to do so may result in penalties.

Planning for defined water objectives including level of service

In Queensland, level of service (LOS) objectives are legislated only in the South East region, and the government has developed guidelines to assist other regional service providers to set their own non-mandated objectives (Department of Natural Resources Mines and Energy, 2018, p. 22). The case study below highlights the key features of this approach.

CASE STUDY 1. South East Queensland (SEQ) water security level of service (LOS) objectives

Introduction

Fundamental to planning for water supply security is a good understanding of the water supply characteristics, the water demand of the community and the expectations of the community. All of this information is underpinned by an evaluation of the current level of water supply security. The SEQ LOS objectives 2018 argue that 'a water service provider, with its knowledge of the local water supply system and understanding of water use and community expectations, is the most appropriate entity to undertake this planning.'(Queensland Government & Department of Natural Resources Mines and Energy, 2018).

To determine water security level of service (LOS) objectives, a water service provider will need to:

(1) Assess the available information, including the characteristics of the water supply and the community expectations

(2) Consider the trade offs, for example identifying the costs of potential changes required to the water supply system to achieve a particular level of water supply security

(3) Determine a suitable target, by considering the ability to meet the level of service objectives under varying circumstances

This level of service approach can result in both the water service provider and the community having a greater awareness of the potential risks to the water supply and can lead to more efficient water management and appropriate investment in water infrastructure (Queensland Government & Department of Natural Resources Mines and Energy, 2018, p. iii).

Level of Service Objectives

Water security level of service (LOS) objectives can be viewed as a planning tool that sets targets for long-term water supply security for a community. The objectives relate to the *bulk water supply system*, rather than to the final water supply provided to homes. LOS objectives contribute to a community's understanding of their water security position and provide guidance to planners and decision-makers particularly regarding investment, to ensure there is adequate water supply available over the long-term (Queensland Government & Department of Natural Resources Mines and Energy, 2018, p. 1). The LOS objectives provide specific targets for various water supply security indicators, such as expected water demand and the frequency, severity and duration of water restrictions.

Beyond the quantity of water supplies, LOS objectives can also describe quality standards and service reliability standards. Queensland has a well-established water quality management framework that requires the development of drinking water quality management plans with accompanying water quality monitoring and reporting. The Department of Natural Resources Mines and Energy (Queensland Government & Department of Natural Resources Mines and

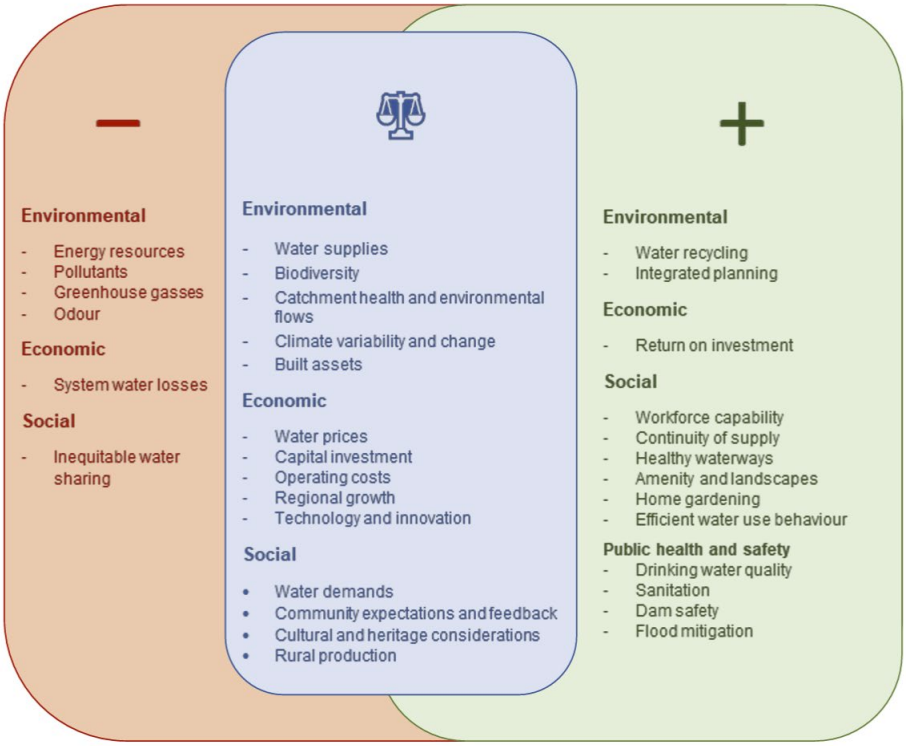
Energy, 2018) recommends that Water Service Providers (WSPs) do not include water quality standards in LOS objectives, other than a statement of compliance with the relevant existing legislative and regulatory frameworks. LOS objectives can also describe reliability standards for the delivery of water services, such as pressure delivered, frequency of loss of supply and other such matters. In urban Queensland, WSPs are required to develop and publish customer service standards that set target levels of service for key performance indicators against activities such as billing, continuity of services and complaint management. By comparison, the SEQ guideline and the focus of this report is on long term security of supply (Queensland Government & Department of Natural Resources Mines and Energy, 2018, p. 2). The guidelines indicate: 'The objectives are a planning tool to secure long-term water availability, whereas customer service standards provide details on 'day to day' service levels to be provided to customers and cover matters such as water quality, supply pressure and the response times for a supply issue.' (Queensland Government, 2019, p. 12)

LOS objectives are dependent on the community values as well the local supply characteristics and are therefore generally set for the urban water supply associated with a particular community or town. LOS objectives commonly include statements about: how much the water supply system will typically be able to supply; how often, how severe and for how long water restrictions might occur; and the possibility of needing an emergency water supply due to a prolonged drought (Queensland Government & Department of Natural Resources Mines and Energy, 2018, p. 2).

The selection of water security supply operations, including LOS objectives factors is affected by water demand, supply infrastructure and supply operations and can include factors such as: water use, population projections and predicted future demand; infrastructure capacity and hydrological nature of network; cost (social, environmental and financial) of supply, changes to operations and of additional infrastructure; supply characteristics, water restrictions and community resilience; consequences and likelihood of emergency measures, storage characteristics and climate variability .

When deciding on LOS objectives, and undertaking water supply planning generally, there are a number of environmental, social and economic factors that should be considered and balanced appropriately. The Figure below highlights these factors.

Figure 1 Environmental, social and economic factors impacting on level of service



Factors that should be minimized (-), balanced (=) and maximized (+) when undertaking water supply security planning (Queensland Government & Department of Natural Resources Mines and Energy, 2018, p. 4).

The following considerations DO NOT generally form part of the process for developing LOS objectives:

1. irregular short term events or hazards that might affect the immediate quantity and quality of water supplies (e.g., floods, bushfires and acts of intentional vandalism)
2. operational issues, such as:

a. temporary operational issues such as supply interruptions due to loss or power or maintenance (these are dealt with in customer service standards)

b. constraints within the water supply system that potentially limit the ability to meet demand, for example pumping capacity limiting the ability to transfer water within the system

c. water leaks, meter reading inaccuracies and unmetered take.

Standards for water quality and short term service delivery are managed through existing frameworks and requirements established by the state and therefore do not form LOS objectives (Queensland Government & Department of Natural Resources Mines and Energy, 2018, p. 4).

In NSW, levels of service are not clearly or consistently defined although a recent revision of Department of Planning, Industry & Environment (DPIE)'s Safe and Secure Water Program aims to ensure a 'minimum level of service' in those smaller towns where there is no economic benefit to providing critical infrastructure (Department of Planning Industry and Environment, 2021, p. 22). NSW has also created legislation in response to drought conditions to secure water supply in regional areas (see below).

NSW Water Supply (Critical Needs) Act 2019

The Water Supply (Critical Needs) Act 2019 creates a temporary pathway for the Minister for Water, Property and Housing in NSW to authorise critical water infrastructure developments which are urgently needed to secure water supplies for regional towns in the current drought where this cannot be achieved through the usual planning approval pathways in time to prevent a town or locality running out of water.

The Act also enables the Minister to turn off or modify the Water Management Act 2000 to speed up the granting or amendment of water licences and approvals required for critical town water supplies. The Minister can also use other mechanisms already available such as amending water sharing plans, and modify water sharing arrangements in favour of towns, where needed, with concurrence of the Minister for Energy and Environment.

Under the Act, town or locality water supplies and associated water supply developments can be declared as critical where the Act is likely to provide the only legal and practical pathway for proponents to address the risk of water supplies running out prior to this happening.

This declaration allows public authorities, such as local councils and WaterNSW, to then apply for an authorisation for proposed developments under a streamlined pathway. This pathway involves consultation with all relevant authorities and concurrence of the Minister for Energy and Environment. Authorisations are issued with conditions to ensure developments are carried out appropriately. The Act also declares certain development relating to dams to be critical State significant infrastructure (NSW Government, 2019).

As outlined above, the Victorian Water Act makes a distinction between safe water and regulated water (Chief Parlimentary Council, 2003 and 2019), while the Northern Territory and Western Australia define the level of service by outlining the safety parameters, flow, and security of supply. These components of the service are not outlined in a clear definition, but embedded in a variety of documents and guides (Northern Territory Government, 2021; Western Australian Auditor General's Report, 2021). For example, the newly published Northern Territory Strategic Directions Water Plan addresses climate change issues, water security, and response times as issues confronting remote communities, but does not provide a succinct definition of level of service (Northern Territory Government, 2021).

The role of collaboration within regions / across regions in providing services

Across the various jurisdictions, there is no uniformity regarding the collaborating entities with linked responsibility for water supply service provision. Even where similar entities exist,

governance arrangements, policies and procedures differ markedly between them in all states and territories. WSAA is currently undertaking a project to better map the various stakeholders engaged in each of the states and territories in the provision of water supplies to remote Indigenous communities (Vanweydeveld, 2022 per comm).

Funding and governance for water services for regions/remote areas

In 1997, all States and Territories agreed on a common definition of a Community Service Obligation (CSO): 'A Community Service Obligation arises when a government specifically requires a public enterprise to carry out activities relating to outputs or inputs which it would not elect to do on a commercial basis, and which the government does not require other businesses in the public or private sectors to generally undertake, or which it would only do commercially at higher prices' (Industry Commision, 1997, p. 7). This definition contains several key elements. First, it requires a CSO to be a government directive to a government business enterprise on a specific service or function. Second, the definition requires that, under the same conditions, a CSO would not have been provided if the enterprise assessed the proposal on purely commercial grounds. Finally, to be regarded as a CSO, the specified service or function must provide an identified social benefit.

In their 2019 paper identifying and overcoming barriers to collaborative governance in Indigenous communities, Jackson et al (2019, p. 5) described a CSO as 'a taxpayer funded subsidy to provide affordability equity of services such as electricity and water to remote and rural areas.'

In many regional and remote areas, provision of water services and systems may not be commercially viable, even using the lower bound estimate for charging assuming no return is provided on existing capital costs. In these cases, to ensure a basic standard of safe and reliable drinking water, State and Territory Governments may take on a role to partially subsidise systems to reduce prices and prevent 'onerous costs on consumers'. (Australian Government, 2021, p. 29). The National Water Initiative recommends that this occurs through a transparent and publicly reported Community Service Obligation (CSO) payment (Australian Government, 2011). Some State and Territory governments, including in SA, WA and NT, currently provide these CSO payments to government-owned utilities to cover servicing costs for regional communities who experience higher costs (Australian Government, 2021, p. 29), whereas in NSW and Qld, where most regional and remote services are delivered by local government-owned providers, State Government support is often through non-recurrent grants rather than untied CSO payments.

Coliban Water provides an example of how water supplies are managed in regional Victoria, where there are towns with populations under 100. It covers relevant issues of basic level of service and funding through community service obligations.

CASE STUDY 2. Coliban Water: an example of regional and remote services in Victoria

One of the major Water Corporations for rural Victoria is Coliban Water. It is one of the 13 regulated water utilities in Victoria. Coliban services central and northern Victoria and was formally established as a Regional Urban Water Authority in 2007 and more recently as Coliban Water. It provides water and wastewater services to 49 towns across five regions. Customers are able to access the Coliban web site in order to determine if their water supply is safe to drink, or regulated (Coliban Water, 2022b). Seven small towns within the Coliban catchment area, with populations from 20-90 persons are serviced with regulated water: The Borung, Dingee, Jarklin, Macorna, Mitiamo, Mysia and Wychitella. Under the Act (Chief Parlimentary Council, 2003 and 2019), Coliban ensures that customers are aware that the water is regulated and not safe to drink through adequate public signage (Coliban Water, 2020-2021).

Basic level of service

Coliban does not define a basic level of service for water, although its charter seeks to ensure that water is reliable and the flow sustained (Coliban Water, 2018, 2022b). Consistent with the Act, water is defined as either 'safe to drink' or 'regulated'.

Coliban has a policy statement for urban water supplies that clearly outlines the requirements for its customer base to be aware of the water quality of a specific supply as potable, regulated or recycled. The policy also requires information be provided on flow rates, testing regimes, prices and guaranteed service level (GSL) rebates and prices (Coliban Water, 2018). In this context a GSL rebate is any form of payment or compensation made to a customer by a water business due to a breach of the water business's stated obligations under a guaranteed service level scheme as approved by the Essential Services Commission (ESC). A similar charter for rural customers supplying non-potable water for irrigation and livestock (Coliban Water 2018), aligned to Victorian Essential Services Commission guidelines is also published (Essential Service Commision Victoria, 2020).

Guidelines covering water supplies provided by Coliban Water, do not adhere to the concept of a basic supply standard, but use the terms *'safe supply'* aligned to the definition of quality determined by the Australian Drinking Water Guidelines (ADWG) (Australian Government, 2011). The term *basic* suggests *minimal supply* and does not ensure safe supply. Similar to Tasmania, Coliban Water takes a risk management approach with the focus on safe, rather than basic supply. Safe water assumes reliable and sustainable supply (Coliban Water, 2020-2021).

Regulating price: Coliban Water- Elmore decision

The price of water is regulated by the Essential Service Commission (Victoria). For example, in 2018, Coliban made an application to provide a 20% fee discount for Elmore's wastewater given the town had received a lower level of service in comparison to other towns. In its 2018 review of prices the ESC agreed to the proposal, noting that: *In its response to our draft decision, Coliban Water pointed out that its customers in Elmore have been paying the same sewerage prices as other towns, despite receiving a lower level of service. Its proposed price discount for these customers reflects the actual service level received and has no impact on the current servicing arrangement or operating costs* (Essential Service Commision Victoria, 2018, p. 12). While this decision is in reference to sewerage, it sets a principle that where the

corporation believes the GSL is below that of other customers, then the price should reflect this.

The process for reaching this decision is useful for gauging how Coliban Water consulted with the residents of Elmore. Elmore is a small town in the City of Greater Bendigo with a population of just under 668, with many residents on low incomes well below the medium for Greater Bendigo or the state of Victoria (City of Greater Bendigo, 2021), Raw water is supplied to the town from 2 groundwater bores and treated at the Elmore Water Treatment Plant. Sewage is also treated at the Water Reclamation plant (Coliban Water, 2022a; Coliban Water & Connect Coliban, 2022). In 2017 some residents of Elmore and Lockingtson argued that given they had a septic tank effluent draining (STED) system for sewerage they should not be charged the same price as those customers on mains sewerage systems. They also had to pay the costs of cleaning their septic system, often costly given there are no maps of existing STED systems within the Bendigo Council archives (Coliban Water & Connect Coliban, 2022). The residents of Lockingstson voted to have Coliban clean the septics every three years at a cost to the utility provider, while the residents of Elmore selected to receive an annual rebate of $124 paid quarterly. Coliban Water held community meetings in both towns. Thirty-three percent of customers attend the meeting in Elmore with 68% voting for this option (Coliban Water & Connect Coliban, 2022). Coliban's pricing submission suggests the investment case is built of past program performance and several years of community engagement, with the communities presented with four options to improve the level of service (Coliban Water & Connect Coliban, 2022). In this case, weight appears to have been given to community expectations and preferences, with the standard of sewerage in other towns served by Coliban in essence acting as a shadow level of service.

Self-supplied

All towns in the Coliban catchment area, with the exception of 7 small towns noted above, receive safe drinking water that meets the Victorian Department of Health guidelines (Chief Parlimentary Council, 2003 and 2019). In addition, towns with populations of 20 or fewer residents are self-supplied and do not have access to either safe or regulated water. It is assumed that they use rain-water tanks or have their water trucked in. There are no plans to bring these small communities onto a regulated or safe water supply, although occasionally this may occur if, in the event of major upgrades to larger towns, it is economically viable to link these populations to the regulated or safe supply. It is acknowledged that small towns that are either self-supplied or received regulated water usually have a number of residents on low incomes and that lack of access to safe drinking water usually correlates with lack of access to other social determinants of health (City of Greater Bendigo, 2021). During times of drought, whether water is regulated or self-supplied, if residents are forced to pay for drinking water to be trucked in, the Victorian government provides rebates as well as support to reduce wastage (Victoria State Government, 2019, 2021).

Community Service Obligation

Coliban has a community service obligation program in place, ensuring the price is standardised for all customers, with larger towns subsidizing smaller towns.

The third case study (WA) provides examples of remote service provision and setting guidelines for essential services, as well as an understanding of dealing with self-managed communities including consultation.

CASE STUDY 3: Western Australia

Introduction

Providing regulated services to remote towns and communities remains problematic in Western Australia and has occupied various governments over several years, even before the Productivity Commission's Report on the renewal of the National Water Initiative (Australian Government Productivity Commission, 2021; Western Australian Auditor General's Report, 2021). Indeed, a number of state-based reports have previously attempted to define the terms of interest including 'self-managed/supplied settlements/communities' and 'basic level of service', as well as questioning how to extend the Community Service Obligation (CSO) to remote populations, ensuring support for Indigenous businesses, and meeting the high cost of providing essential services to remote communities (Government of Western Australia Department of Housing, 2014; Government of Western Australia: Regional Services Reform Unit, 2017). The delivery of essential services to remote towns and communities in WA is difficult given the distance from major government administrative centres; the isolation of many communities during the wet; lack of clarity around asset ownership; lack of a skilled workforce to manage equipment; and the need to provide fit-for-purpose infrastructure given climate extremes (Western Australian Auditor General's Report, 2021).

Commonwealth withdrawal from remote service provision

The WA state government provided essential services to a number of remote Aboriginal communities even prior to the 2015 removal of federal funding. Full responsibility for all remote settlements occurred in 2015 with the Commonwealth Government providing the state with $90 million as part of the handover agreement. At the time of handover, the Federal government was providing essential services to 59 Aboriginal remote communities with the state government supporting the other 89. During the change-over the state government took on responsibility for a total of 141 remote communities, losing seven designated as too small to receive services. These figures are contested, with an alternate report suggesting there were indeed 287 Aboriginal communities or a population of 17,000, with 155 of these self-supplied and 91 settlements with populations less than 50 directly serviced by the state government (Government of Western Australia Department of Water, 2009). Thirty of these communities identified having an essential services officer on-site to test water quality on a regular basis. These officers were able to notify the relevant department to ensure maintenance occurred or water quality was addressed.

Actual service delivery of remote essential and municipal services is outsourced to regional businesses in the Kimberley, Pilbara and Goldfields. Funding from the state government to the Department of Communities does not cover services to small and self-managed communities (Western Australian Auditor General's Report, 2021)

Following the transfer of functions, the WA government commissioned an Auditor General's report into essential service provision in remote communities as part of a stock take of

services. In 2015 and 2017 comprehensive overviews of all essential services ranging from water to education in the Kimberly, Pilbara and Goldfields were completed (Government of Western Australia: Regional Services Reform Unit, 2017; Western Australian Australian Auditor General's Report, 2015). Difficulties were identified with service provision around ownership of land and the assets; lack of critical mass to afford the high cost of service infrastructure and on-going supplies; lack of effective community leadership; and poor housing maintenance programs (Western Australian Auditor General's Report, 2021, p. 13; Western Australian Australian Auditor General's Report, 2015). In a number of communities, water was delivered to the gate, and not to individual households leaving the management of water costs to local councils.

In 2021 the WA Auditor General conducted a second audit of essential services for remote Indigenous communities. The aim of the 2021 audit was to assess if the Department of Communities and the Remote Essential and Municipal Services Unit had achieved recommendations made in 2015 (Western Australian Australian Auditor General's Report, 2015).

Remote Service Level Guidelines for essential services

The Remote Service Level Guidelines published in 2014 by the WA Government's Department of Housing provides information on the 'minimum level of service' for remote communities. This level of service differs from that provided to large towns in that it does not refer to reliability or customer satisfaction, however, health parameters cannot be compromised, and the infrastructure must meet regulatory requirements. Three factors impact on the level of service: *supply, location and size of the community*. Supply refers to stand-alone, independent self-contained or off-grid communities not linked to water networks (this impacts on reliability, cost and supply) (Government of Western Australia Department of Housing, 2014, p. 1). Included in this definition is the recognition that given the supply is not networked to larger reserves there may be limits on supply long term or at certain intervals. There is also a recognition that access to water is dependent on power supplies. Location refers to isolation and seasonal impact on access. The Australian Index of Remote Areas (AIRA) is used to classify remoteness. Size is measured through the number of connections (houses) rather than the population as it is known that populations fluctuate in remote communities, and it is recognised that it is unlikely that tradespersons with the technical skills will be available to do repairs.

Basic level of service

Three different terms are currently used by WA's Water Corporation to describe a *basic level of service*: 'equivalent' standard of service; 'reasonable' standard of service; and 'equitable' standard of service (Water Corporation Home Page, 2022 (update not noted)). These terms are seen as complementing the *Closing the Gap* agenda (Governement of Western Australia, 2021). The guidelines also recognise that the Annual Average Daily Demand (AADD) is higher than in the larger towns and cities and that this is due to the poor infrastructure relating to housing and water connections. Interestingly, the guidelines do not take note of the impact of the harsh climate on infrastructure or the need for increased water intake in tropics and desert environments.

The 2021 Auditor General's Report identified a *basic level of service* as regular testing of potable water, rapid response to faults, reporting on testing to the community, and up-grade of infrastructure. Currently, this is only achieved for communities designated as large. Chemical parameters such as taste, and smell are not considered part of a basic level of service.

Basic supply

Basic supply is defined using three criteria: *water quality, water security/reliability and water flow/pressure*. Water quality must meet health department guidelines as set out in the ADWG 2011 (Australian Government, 2011). The difficulty in meeting these guidelines comes in the ability to test for water quality parameters due to lack of expertise on a regular basis in remote sites. The guide recommends monthly testing, however the 2021 audit report identified that this is not occurring and that up to 51 communities had not had water tested between 2015 and 2019 (Western Australian Auditor General's Report, 2021). The guide recommends a Safe Water Plan and a Water Source Protection Plan for communities where regular water testing is not performed. There is no information on whether or not these plans are in place. While the guidelines seek to meet the health parameters, this does not include aesthetics such as taste or smell, which are listed as aspirational targets. When water quality fails, residents are advised to boil water or are provided with alternate supplies. The Auditor General report noted that in some communities this was extended beyond 9 months (Western Australian Auditor General's Report, 2021). Guidelines for responding to water pressure problems differ according to the size of the community from between 12 to 24 hours for large communities and beyond 48 for smaller settlements.

Self-managed communities

A definition is provided in the 2014 Dept of Housing guide for self-managed, small and large settlements: *self-managed remote settlements* are those with less than 5 houses or service connections, communities with less than 30 people, or homelands that are not permanently settled. *Small remote settlements* are defined as those with 5 to 39 houses with 30 to 199 people, while *large remote settlements* are those with 40 to 200 houses and up to 1000 people (Government of Western Australia Department of Housing, 2014). The Guidelines specifically apply to small and large remote settlements as defined above. While self-managed settlements are not specifically targeted, service levels in these locations should 'aspire to meet the minimum requirements set out in these Guidelines for small remote settlements' (Government of Western Australia Department of Housing, 2014, p. 2). Reference is made to Aboriginal settlements in towns with the assumption that these dwellings access the same supplies as other town residents. The guidelines state that the ADWG (2011) do not apply to those communities where the price is prohibitive ((Government of Western Australia Department of Housing, 2014, p. 3).

A list of 69 communities that are self-managed is provided in the 2021 Auditor General's report with accompanying maps and designation of large, small and self-managed and nearby towns. Self-managed communities and settlements do not qualify under the current Remote Service level guidelines to have water regularly tested, to receive up-grades or to have power service up grades. The evidence suggests that small communities also do not have regular testing for water quality. They are in effect self-managed or not managed at all, given managed refers to monthly water testing for health parameters.

Community engagement

The Department of Housing's 2014 guidelines for defining a community as large, small or self-supplied are not transparent, and it is difficult for customers to access complaint services. Little reference is made in either the 2015 or 2021 Auditor General's Reports to community engagement. The 2021 audit recommended more formal consultations with communities but does not indicate what the topics should include. The Auditor General's 2021 report received considerable media attention, particularly from the Indigenous press (Smit, 2021) and organisations with expertise in water quality (Australian Water, 2021). It clearly impacted on the Labor government's decision to transfer responsibility for essential services to the Water Corporation in 2022.

Summary of Auditor General Findings

The Auditor General's 2021 report findings can be summarised as follows:

-Fifty-one communities previously managed by the Commonwealth were designated as small settlements following the transfer of all communities to the state in 2015;
-Small communities had not been tested for water quality between 2015 and 2019, four years after entering the Remote Essential and Municipal Services (REMS) in effect making them self-managed;
-All the recommendations from 2015 had been met for those communities defined as large, but not for those designated as small;
-Water quality has improved in 38 communities;
-There were positive contaminants tests in 37 communities in the 2019-2020 financial year
-The Dept had no plans in place to improve water testing rates. Scheduled plans focus on system maintenance and bore up-grades, rather than water quality testing;
-No mechanism exists to report on those communities that are at risk due to poor water quality;
-Upgrades were planned for ten large communities managed by REMS that would provide them with services similar to towns, but only 2 had been completed at the time of the audit. -There were no plans to extend beyond the 10 communities.
-Allocations of up-grades are made on the basis of tiered guidelines, so this is consistent with the 2014 guidelines, but the decision is based on number of dwellings, so small communities never qualify;
-Very few communities had power supplies from approved electricity licensed suppliers, and none receive water from a licenced supplier;
-Horizon Power's programs planned upgrades to larger communities, but no plans for small or self-supplied/managed communities;
-Estimations of community populations made by the REMS are not transparent, and often not based on ABS data; however it was recognised that department figures may be more accurate, but it is not clear how they are derived
-Current provisions are mostly consistent with guidelines, but leave many small and self-managed communities at risk;
-The auditor suggests a risk-based approach rather than a population-based approach to investment and quality water testing. The report recognises this will require changes in policy and will be costly (Western Australian Auditor General's Report, 2021).

The 2022 Home page for Remote Essential and Municipal Services (REMS), a division within the WA Department of Communities, notes that water services are not provided by a regulated agency to 137 small communities and four self-supplied communities covering over 12,000 people. In a later section the REMS Home page notes that there are approximately 200 Aboriginal communities in WA with around 3,000 living in town-based communities. The day-to-day servicing of remote communities is done through a tendering process to regional businesses, for example, the regional provider for the Kimberley is the Marra Worra Aboriginal Corporation.

In 2022 the McGowan Labor government announced plans to transfer responsibility for essential water services for remote Aboriginal communities from the Department of Communities to the Water Corporation (Government of Western Australia Department of Communities & Horizon Power, 2022). Similar information is provided on the Remote Essential Services Home page (Government of Western Australia Department of Communities & Horizon Power, 2022; Government of Western Australia Department of Communities & Power, 2021). In making the announcement the government made the following claims:

-The transfer of services from the Department of Communities REMS to the state government utility Western Australian Water Corporation would result in the 141 remote Aboriginal communities in the Kimberley, Pilbara, Midwest Goldfields along with 39 town-based communities receiving the same level/standard of service as similar sized towns in Western Australia;
-Water charges would be equivalent to towns of similar size;
-All designated communities would be briefed over the next 12 months through a face-to-face consultation

Media reports published by the Labor Government suggest that the process is underway with four communities designated for upgrades and transfer to the Water Corporation in 2022. Water Corporation will become the licensed water service provider for the remote communities of Ardyaloon, Djarindjin, Lombadina and Beagle Bay on the Dampier Peninsula in the West Kimberley, with planning and investigations to also commence for some other remote communities. Water services will also be upgraded at several town-based communities throughout the State (Government of Western Australia, 2020). Funding is through the Essential and Municipal Services Upgrade Program (EMSUP). There is little consistency in labelling communities according to their population size with Beagle Bay designated as a large community, while Lombadina, with a similar population size, is listed as a small community (Western Australian Auditor General's Report, 2021).

The WA government's aim for the transfer of essential water supplies to the Water Corporation is to work towards provision of a level of service for Aboriginal communities that is equivalent to that of a town of similar size that has a regulated water supply. This component of WA Government strategy addresses the recommendations arising from the *Closing the Gap*. However, not all communities come under the scheme through the Closing the Gap strategy, since some small non-Indigenous remote communities will also benefit from the policy shift. This is consistent with the Productivity Commission's recommendation to extend basic services to all small communities and towns not serviced by a licenced and or

regulated water provider (Australian Government Productivity Commission, 2021). A major component of the handover will be to establish with the Regulator what is an appropriate level of service for all small remote communities and to ensure that these populations have the same protections in terms of health parameters, supply and sustainability to domestic water as all other West Australians. The plan will also action the Community Service Obligation (CSO) in some form as the water will be provided through the Water Corporation allowing for cross subsidisation (Western Australian Auditor General's Report, 2021).

The fourth case study (below) covers the challenges of Tasmania as a state with a small population base but significant challenges of physical geography with regard to the provision of safe supply. They have identified interesting approaches to billing linked to quality of service provision and to community engagement, which other states may wish to consider.

CASE STUDY 4: Tasmania and the high cost of providing safe drinking water to remote towns

Introduction

Drinking water in Tasmania is supplied by regulated entities, the largest being TasWater, and a small number of private drinking water suppliers and water carriers (Director of Public Health, 2015). Private drinking water suppliers can deliver water to commercial properties, health and educational facilities or prisons with the water obtained from a private source. The water may not be under the control of a regulated entity, although it is assumed these agencies have drinking water management plans in line with their customer base (Director of Public Health, 2015, p. 6). All private providers must register with their local council, although they can operate outside these council boundaries. The water provided for drinking must be compliant with the Tasmanian Drinking Water Guidelines, and be tested every 12 months (Director of Public Health, 2015). According to the economic regulator just over one-fifth of Tasmanians have a rain water tank as their primary source of water (Tasmanian Economic Regulator, 2021, p. 6)

Utility Provider: TasWater

TasWater is the major utility water provider in Tasmania. It was formed in 2015 following the amalgamation of 29 local government council services. The other shareholder is the Tasmanian state government (TasWater, 2022a). The Tasmanian government has a 2% share in the utility with this increasing to 10% as it provides the majority of funding for large infrastructure projects (TasWater, 2020). Dividends are paid to all 29 councils and the state government with the exception of the period covering COVID-19 (TasWater, 2020). Prior to 2006 all 29 councils managed water supplies. It took a state government taskforce to identify serious issues with asset management, lack of funds to manage debt, and up to 50% of

councils non-compliant with their licencing conditions. Twenty-three were on permanent boil water alerts despite being visited by large numbers of tourists (Aulick et al., 2010). The taskforce recommended the establishment of either one provider or a regional model. Initially a regional model was established. By 2013 the three new water utilities, Ben Lomond Water, Cradle Mountain Water and Southern Water had merged to form TasWater. The issues identified by the 2006 Taskforce remained forcing a further amalgamation into one entity under the 2001 Corporations Act (TasWater, 2021a).

The dispersed population across 4500 square Km^2 made it difficult for the 29 councils to achieve economies of scale. This is still a problem to some extent for TasWater with a density of 33 properties per kilometre of water main as against mainland averages at around 66 per kilometre (Tasmanian Economic Regulator, 2021). As noted in several of its reports it has a higher number of assets per customer than any other utility provider in Australia, and began operation at a distinct economic disadvantage given a history of low levels of legislative compliance for water safety and the large number of dams requiring regular maintenance and up-grades to ensure safety (TasWater, 2021b; 2022b, p. 11). This is starkly illustrated by work done in 2020 that showed that while TasWater only serviced 3% of Australia's population it had 21% of water and sewerage treatment plants, with less than 2% of revenue (TasWater, 2022b). This situation is further exacerbated by reductions in rural populations (Infrastructure Australia, 2019). Despite this, TasWater has embarked on an ambitious infrastructure up-grade plan achieving no-boil alerts since 2018, for example, in the 2019-20 period there was an increase of 1.2% of properties connected to water mains, representing an additional 3000 properties to 215,000 from 2018-2020 (Tasmanian Economic Regulator, 2021). In determining new projects TasWater employs a process similar to project budget marginal analysis whereby the funds allocated are measured against the social, health and economic gains (TasWater, 2022b).

TasWater manages 62 supply systems spread across 72 catchment sources. This covers 72% of its population of 541,071, providing water that is compliant with the Australian Drinking Water Guidelines. In the 2018-19 Annual Report, TasWater achieved zero boil alerts (Australian Government, 2011; Public Health Services, 2018). Forty-four percent of towns serviced by TasWater have populations under 500 (Public Health Services, 2018). Water and/or sewerage supplies are provided for towns with populations well below 100. Examples are Bronte Park (46), national Park (23) and Adventure Bay (1) (TasWater, 2015).

Basic level of service

Water provided by TasWater is classified as potable or 'limited water' quality. Limited water quality is divided into categories: low pressure, water contaminated by microbiological or chemical agents (TasWater, 2022b). All services provided by TasWater comply with the regulator (Tasmanian Economic Regulator, 2021).

The majority of water provided to Tasmanians through TasWater complies with the ADWG and the standards set by the Tasmanian Department of Health. The report to the Legislative Council notes that while it is reassuring that these guidelines are met, TasWater plans to move to a risk based approach over the next few years (TasWater, 2022b, p. 47). Under the

legislation water connections are provided only to *serviced land*. Where land is not designated as *serviced*, TasWater does not provide water or sewerage services (TasWater, 2022b)

Pricing

Under the current legislation there will be no price increases above 3.50% for water or sewerage services until 2025, with current prices benchmarked against other utility providers in Australia and comparable. There are a number of households in Tasmania who pay well below the market price. A program is in place to bring these households into line with other customers (TasWater, 2022b, p. 167). All customers pay the same amount for their water with the costs evened out across the state. There have been discussions on charging rural and remote customers a higher cost, but this is deemed to be administratively expensive.

The customer base is divided into eight categories: full service customers for water; full service customers for sewerage; limited water quality customers; limited water supply customers; combined limited water quality and limited water supply customers; fire service customers; commercial trade water customers; and septic tank effluent disposal (STED) scheme customers (TasWater, 2022b, p. 197). The price charged is referred to as the cost-reflective price. Where the pressure is low, cost is at 90%, where the quality is low, cost is at 80% of the cost-reflective price (TasWater, 2022b, p. 184). TasWater has a hardship rebate for customers on pensions (Tasmanian Economic Regulator, 2021).

Self-managed Services

A number of small towns in Tasmania, particularly on the west coast, are self-supplied. Discussions continue on bringing these towns onto the TasWater grid. The major hurdle is cost, the isolation of many communities and the low populations. The difficulties and costs faced by TasWater are captured in the case of the town of Pioneer some 120 Kms from Launceston, where there are 43 customers across a population of 89 residents. The town of Pioneer provides a case study of the financial costs confronting TasWater and while not a precedent, demonstrates the issue. In 2012, the town's water was deemed unfit to drink due to elevated lead levels. Given the town was a former tin mine, it was assumed the lead came either from the water itself, pipes in the distribution system or local plumbing in the houses. Following what was presumed to be adequate testing a rainwater reuse system was proposed. TasWater replaced all the rainwater tanks in the town, and installed pumps, and dual water filtration components in all houses (McLennan, 2022; Southland, 2019). By 2019, however, quarterly water testing by TasWater found three homes had water with elevated lead levels more than three times the Australian Drinking Water Guidelines (Slade, 2022, March 13). Testing found that this was due to run-off from gutters and roofs of a number of the houses that had not been adequately tested prior to installing the rainwater tanks (McLennan, 2022). Following extensive consultation, TasWater committed to providing regulated water to the town by 2023. The system proposed is a continuation of two existing water schemes (TasWater, 2021c). The new scheme has been approved by the regulator following an investigation into the costs, efficiency and prudence of the proposal. The project is costed at $4.5 million or in excess of $110,000 per connection (Tasmanian Economic

Regulator, 2022). Meanwhile TasWater continues to test the rainwater tanks for elevated lead levels (Vinall, 2022, May 23).

Community engagement

TasWater adheres to the IAP quality assurance guidelines for customer engagement (IAP International Association for public Parmcipation Australia, 2015) and has an extensive program of community engagement. For example, prior to providing water or sewerage services to a town a three-stage process is instigated from initial consultation, drawing up of plans and costs to final agreement. At each stage a designated percentage of customers must agree to proceed. In the initial stages 80% of residents must agree to be connected to TasWater before a council can proceed to engage with the utility (TasWater, 2022b, p. 264). Barriers to signing on with TasWater may arise in those towns that have historically not paid for water or paid at a lower rate than the current rate charged to all Tasmanians.

A recent willingness-to-pay survey commissioned by TasWater found that its current customers are not willing to pay additional annual costs to extend the services to those communities that are not connected to TasWater. This observation was made on the basis that willingness-to-pay agreements require a 70% threshold (TasWater, 2022b, p. 28). Another willingness-to-pay survey of its customer base also identified unwillingness to pay for accelerating infrastructure projects that might eliminate problems in water quality such as taste and colour if it increased costs of the initial infrastructure (TasWater, 2022b, pp. 27-28).

Services in remote Indigenous communities

Provision of water supplies to remote Indigenous communities remains problematic. Pertinent issues identified from the literature and interviews with key stakeholders include: difficulties in generating a consistent definition of a '*remote Aboriginal community*'; distances from major regional centres; lack of human resources skills at the local level to manage the water supply; the harsh and changing climate; poor source water quality; and socio-economic disadvantage with subsequent health impacts on the Aboriginal populations.

In a recent report on identifying and overcoming barriers to collaborative governance in Indigenous communities (Jackson et al., 2019), barriers identified were (1) governance arrangements and processes; (2) economic and financial challenges; (3) capacity/skills/education and employment; (4) data and information availability; (5) cultural values and norms. For each barrier the authors identified a corresponding opportunity or enabler. Governance was seen as the key barrier and the response to its resolution was to recommend improvement to cross-agency co-ordination and dialogue-based collaboration. These researchers noted that the system needs to be re-oriented away from institutional priorities to focus on the perspectives, needs, health and wellbeing of the community's inhabitants, which should be at the heart of Indigenous water governance.

The Productivity Commission response to national water reform (Australian Government Productivity Commission, 2021) identified significant challenges for security of supply to Indigenous communities. These included: lack of cost recovery; lack of culturally competent staff; poor quality water sources; and fragmented governance. In their recent paper, (Hall et al., 2021) investigated successful programs in remote areas of New South Wales and the Torres Strait Islands in Queensland, and identified five enablers: people factors (support, training, cultural competence); cross-agency collaboration (regulators, funders, state and local government); technology that is fit for place, purpose and local people; funding that is sufficient and sustainable; and taking a systems view of water and sanitation. A case study from Northern Territory below illustrates key issues in context.

CASE STUDY 5: Remote Aboriginal Communities in the Northern Territory

Introduction

In 2007 the Federal Government announced its intention to withdraw funding for water supplies for remote Aboriginal communities in the Northern Territory and to hand full responsibility over to the states and territories. Federal funding for remote communities for other essential services, including housing, ceased with the signing of a formal MOU in 2015.

Responsibility for water supplies to remote Aboriginal communities in the Northern Territory rests with the Indigenous Essential Services (IES) funded through the Territory Department of Families, Housing and Communities. IES is a wholly owned not-for-profit (NFP) subsidiary of Power and Water, NT. It provides water and power services to 72 remote communities and 79 outstations/homelands in the Northern Territory (PowerWater, 2021, 2022) located across three regions; Darwin, Katherine and the Southern Region. Residents in these communities do not pay for water as they are perceived or self-defined as renting homes from the NT Government. All up-grades are funded through various grant schemes and seek to comply with the ADWG, although from time to time there are difficulties in sustaining this level of service, given the water is often bore water with risks of microbiological and chemical contamination, or issues of water security. The Centre for Appropriate Technologies (CAT) 2016 report noted that 209 of 400 remote Aboriginal communities are dependent on bore water, and 80 on river and rain water (Centre for Remote Technology Ltd, 2016). Power and Water NT or other resource agencies service 93% of these communities with residents in 25 communities contributing to the costs of the services. A case study reported by IES notes strategies to reduce leakages in domestic water supplies in houses in remote communities; one example being Ngukurr where savings of 203 ML/year were achieved allowing a number of additional homes to be built (PowerWater, 2022).

A specific Homelands Funding policy was established in NT in 2015, with a grant program initiated to manage house repairs and maintenance of existing infrastructure. Only those communities with access to potable water were eligible for funding (Northern Territory Government, 2022b, 2022c). Underpinning the various grant programs supported by the NT Government is a statement of support for homeland communities and the rights of Aboriginal people to live on these homelands. A distinction is made between homelands that are sited

on traditional Lands and town camps on the edge of urban towns that may be on Crown Land (Territory Families Housing and Communities, 2020). The terms homelands and outstations are used interchangeably. A set formula, based on population size, is applied to both large and small settlements and funds the 394 homelands, 43 town camps and 9 remote communities. One of the major difficulties concerns the fluctuation of residents in any community over the year. In order to be eligible, the designated population must be resident on the community for at least 50% of the year, and where residents have a state funded house elsewhere this is taken into consideration (Territory Families Housing and Communities, 2020). The dashboard, BUSHTEL organises communities into categories of Major, Smaller, Family Outstations or Villages with 10,000 Aboriginal Territorians resident in 2,400 dwellings on more than 500 homelands across the Territory (Northern Territory Government, 2022a).

Water quality is determined partly through a Water Management Plan designed to ensure that each community's water is consistent with the ADWG. The CAT 2016 report, however, noted that fewer than 17% of communities reported having an operational plan, and more recently the Northern Land Council found that only one community had an operational plan (Northern Land Council, 2021b).

Several grant programs are available for remote communities to ensure maintenance and upgrades of their existing potable water supply. These include the Municipal and Essential Services Grant program, the Housing Maintenance Services program for repairs, the Homelands Jobs program and the Homelands Capital Grants program, using the Australian Building Standards as well as those set by the Department of Families, Housing and Communities guide (Territory Families Housing and Communities, 2020). There are plans to consolidate these grants in the future (Northern Territory Government, 2022b). Currently all repair and maintenance programs must ensure water supply infrastructure is operational, and that equipment is appropriate for the environment. Call-out times for repairs are set for the more than 40 service providers across the three regions in the Territory (Territory Families Housing and Communities, 2020). As already noted, to be eligible for funding, a remote homeland must already have potable water supply operational. This in effect means that those remote communities without a potable supply become 'self-supplied' since be definition they are not eligible for the four grant programs. In 2016, the CAT listed 35 communities that were unfunded under the Homelands policy (Centre for Remote Technology Ltd, 2016).

The 2021-23 Homelands Program Guidelines note that there is an expectation of a service delivery fee being imposed to assist with providing services to eligible communities. It also notes that where the community contributes to the service fee there is an expectation that the provider will deliver above the minimum standard, and where there is no service delivery fee, the standard may not be met. Where there is agreement on paying a fee, the service provider must consult with the residents on what that fee should be. One of the major requirements is to develop a Service Delivery Plan that outlines the minimum standard of service and identifies when each step in the service plan is completed (Territory Families Housing and Communities, 2020). Two recent reviews and subsequent policy shifts have each impacted on the basic water supplies, level of service, and what constitutes a self-supplied community. These are detailed below.

The Northern Territory government recently conducted a comprehensive audit of all services provided to remote Aboriginal communities, including homelands (Northern Territory Government, 2020, 2021, 2022c; Northern Territory Government & Office of Water Security, 2022). Services include schools, clinics, and essential utility suppliers such as power and water. The intention is to examine gaps in services in line with the *Closing the Gap* NT policy and to determine where there might be economies of scale that would extend services to remote towns and communities.

The review raised issues relevant to this study: the definition and eligibility of homelands for services to be funded; and the requirement that these remote homelands already have access to potable water supplies to be eligible for funding under current NT grant rules. In addition, the review identified the need for Federal government to re-engage in funding (Northern Territory Government, 2022c).

Defining homelands

Current estimates put the number of homelands in the Northern Territory at 500, covering 2,400 houses with populations ranging from 1 to 100 residents. In total, over 10,000 people live on homelands in the Northern Territory (Northern Territory Government, 2022c). The Review noted that Homelands also vary significantly in the resources which residents have access to, and in their location. Given the variability, the review's authors moved away from a precise definition to 'accept Homelands in all their various regional manifestations' (Northern Territory Government, 2022c). Further to this, the review's authors drew on the 2015 assumptions that homeland could be considered 'small Aboriginal communities where residents live in order to fulfil their cultural obligations to their inherited country and its underlying traditional law', and thereby conceptualises their existence within a rights-based framework in which 'Government acknowledges the importance of Aboriginal people's cultural connections to their traditional lands.' (p7)]. Also noted is that all homelands are community owned and controlled, and that land is held in common, not individually. Home ownership is vexed, as they are not purchased by individuals, and the review argues that the residents regard their houses as government owned, whereas technically they are owned-in-common by the community. In the light of these views, the Review recommended that: *Homelands be defined on the basis of population size and land tenure: as small discrete Aboriginal communities of less than 100 persons of Aboriginal descent living on Aboriginal communally owned and controlled lands. Locations that are already over 100 people, but do not wish to become a community, should be grandfathered and homelands services maintained.* (p15)]. Recommendation 4 additionally requires that the Homeland be the major place of residence for individuals in the count and where left unoccupied for more than four months should be subject to review.

Homelands and Potable water

The review reiterated the 2015 guidelines for funding, stating that only those communities that already have potable water are eligible for funding under the various program grants. The Review maintained this ruling in Recommendation 5: *A Homeland must have an adequate potable water supply for its occupants, as identified in the water management plan for that location. For Homelands being added to the program, funding will not be available to establish*

*a new water source locally (where the existing s*ource of water is no longer available or becomes contaminated and *unusable).*

Homelands that lack potable water can access grants from the Land Councils to improve infrastructure, through their community benefit grants (Northern Land Council, 2021a). They are also eligible for Federal Government grants through the Aboriginal Benefits Account (ABA). For example, the Indigenous Land Enterprise Infrastructure Fund provides grants for water and power infrastructure up-grades to remote communities (National Indigenous Australians Agency Home Page, 2022).

Local Decision Making

The Review also addresses the issue of multiple service providers, noting that there were over 40 engaged in various provisions. A recommendation is made to increase local decision making and streamline the number of service providers per region.

Funding Homelands

The Review also examines funding mechanisms, including suggestions that the Federal Government and the Territory Land Councils contribute to funding. Recommendation 1 is of note in this regard: '*The NT Government re-engages with the Commonwealth Government and Land Councils to encourage a more equitable sharing of financial and program responsibilities, in the interests of securing long term and sustainable policy outcomes through a coordinated approach to Homelands' policy and service provision.'*

Debate continues over this recommendation, exacerbated by the difficulty of providing infrastructure for remote settlements given the distances and climate; the withdrawal of the Community Development Employment Program (CDEP) that provided local employment and governance support; and the replacement of local Indigenous Community Councils by Regional Councils (Northern Territory Government, 2022c, p. 1).

Territory Water Strategy and community engagement

The review of water strategy also considered the impact of climate change on water security (Northern Territory Government, 2020, 2021). The paper uses the phrase '*water stewardship'* and calls on Power and Water NT to ensure that all residents need to be informed and engaged, as well as being responsible for using water wisely. There is also a strong focus on water literacy in the strategy along with a call to adopt the International Association of Public Participation's terms: inform, consult, involve, collaborate and empower (Northern Territory Government, 2021).

Health outcomes and drinking water supply

For most of the population, especially those living in urban areas, Australia successfully achieves the Sustainable Development Goal for quality and access to safe drinking water and sanitation (SDG 6), However, for Australians living in remote Indigenous communities, the experience is very different (Hall et al., 2021). According to the most recent Infrastructure Australia audit 2019 (Infrastructure Australia, 2019, p. 602), and the Department of Foreign Affairs and Trade report on the targets towards implementation of the SDGs in Australia (United Nations High-Level Political Forum on Sustainable Development & Australian Government, 2018, p. 50) there are significant challenges in delivering access to water services in some remote Aboriginal and Torres Strait Islander communities and as a result some are not meeting SDG6 targets consistently. This can have important flow on effects to health outcomes for Indigenous communities where the burden of disease is higher already (SDG 3). Many of these diseases are waterborne or hygiene-related, including prevalence in some remote Indigenous communities of endemic trachoma eye infection, preventable through access to functioning water services and available soap. Risks to Indigenous health from inadequate provision include transmission of hygiene-related infections from microbial contamination, and toxic chemicals that may cause kidney damage or dysfunction (Hall et al., 2021). The research of Hall and others provides a compelling 'case for identifying, then understanding the interlinkages between SDGs 3, 6, and others locally, as well as nationally'. As Hall points out 'This will enable governments to enact policies for long-term sustainable solutions for remotely-located and marginalised peoples in Australia in line with Agenda 2030 commitments (Hall et al., 2021).

A recent report by Wyrwoll et al. (2022) reviewed public reporting by 177 utilities and conducted a national assessment of reported exceedances against the Australian Drinking Water Guidelines (ADWG). They created and tested four definitions of a *basic level of drinking water quality* to quantify service gaps across regional and remote areas of each subnational jurisdiction in 2018–2019.

(1) The SDG 6.1 definition supports assessment of how Australia-wide reporting of access to 'safely managed water services' under the Sustainable Development Goals might change if available data from smaller water suppliers were included in national reporting.
(2) The ADWG Health definition provides insights into the number of people and locations where public investments may be required to ensure a basic level of drinking water quality focused only on health parameters. Note that the inclusion of jurisdictional compliance targets integrates existing approaches to a 'basic level of service' (e.g. E. coli. annual compliance of 99.8% in South Australia, 98% in Tasmania and Queensland).
(3) The ADWG Good definition reflects the ADWG definition of 'good' water quality and the emphasis in the guidelines on water suppliers meeting consumer expectations. In practice, accounting for aesthetic considerations in defining basic service levels is necessary because: (i) unpalatable water affects consumer risk perceptions, potentially leading to indirect health impacts from accessing unsafe alternative sources of hydration including sugary drinks; (ii) buying bottled or trucked water due to distrust of water services is a financial burden for low-

income households inconsistent with affordable access; and (iii) high levels of hardness and Total Dissolved Solids (TDS) may affect water infrastructure integrity, operational costs, and safety. Note that the ADWG definition of 'good' water also includes 'taste and odour' which is specified as 'not offensive to most people'. This characteristic does not have an assigned numerical value as non-compliance can have numerous causes, including the presence of micro-organisms in raw water.

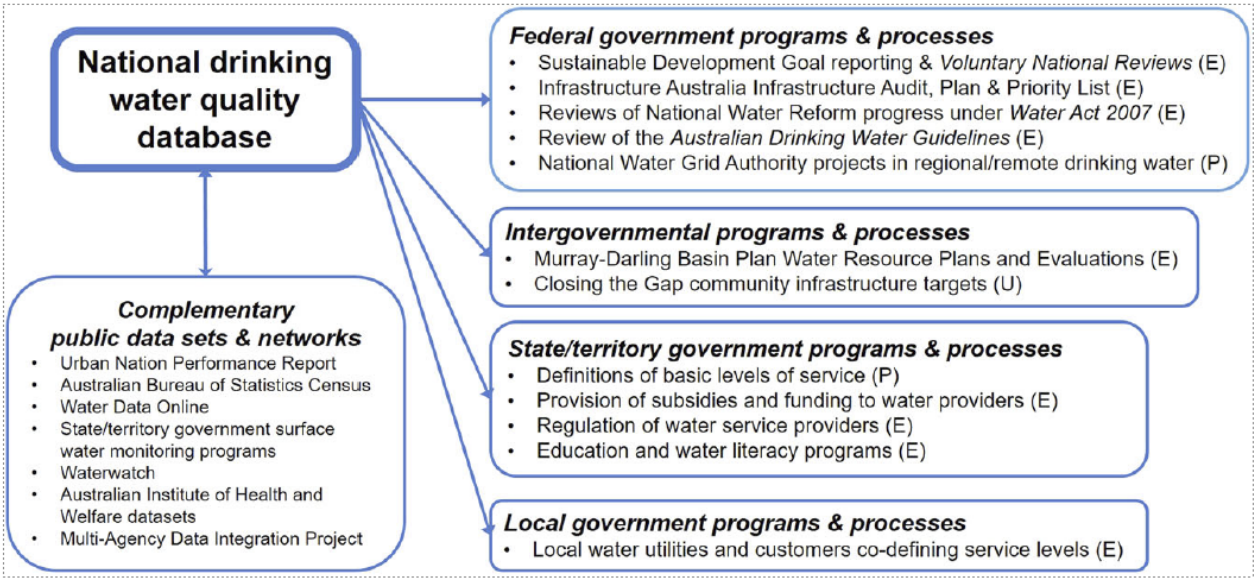
(4) The Metropolitan definition provides a benchmark for assessing the gap in drinking water quality between regional/remote areas and capital cities – where most of Australia's population lives and non-compliance with aesthetic guideline values rarely occurs. Given that any reported monitoring against all guideline values is incorporated into this definition, it provides an upper bound for a basic level of drinking water quality that reflects the breadth of criteria defined by the ADWG.

This approach of creating different definitions of a basic level of quality is utilitarian in that it allows the creation of a tiered approach to management of supply challenges.

The Wrywoll et al. paper identifies 25K people across 100 locations with populations <1000 reportedly accessed water services that did not comply with health-based guideline values. Forty percent of all locations with recorded health exceedances were remote Indigenous communities. They comment that monitoring and reporting gaps indicate that the actual incidence of non-compliance with the guideline values of the ADWG could be much higher than their estimates. Their results quantified the divergence in the assessment of water quality outcomes between Sustainable Development Goal Target 6.1 and the ADWG, demonstrated disparities between service levels in capital cities and the rest of Australia, and highlighted the need for place-based solutions. The authors argue the need for an Australian national drinking water quality database to guide government investments in water services.

Their figure 2 (below) indicates the information which such a database could provide and the mechanisms by which the information could be used to impact on Govt programs and processes in Australia.

Figure 2 Levels of government responsibilities for water supplies



(E) Existing programs and processes, (P) Proposed programs and processes, (U) Under development programs and processes (Wyrwoll, 2022).

Positive examples of partnerships

The Productivity Commission supporting paper on supplies to regional and remote communities (supp paper G, 2021, p43) identifies case studies from NSW, Qld, WA and SA on how strong partnerships can assist in providing safe water. The case studies cover partnerships between State Government and Aboriginal Land Councils; Departments of Health, Water and Infrastructure with local governments and Torres Strait Island Regional Council; and private corporations including WA Water Corporation and SA Water and remote Aboriginal Communities in their respective states.

One specific example cited in DFAT (2018) concerns an initiative in 2008, when the New South Wales Government developed a long-term joint initiative with the New South Wales Aboriginal Land Council in recognition that the quality of water and sewerage service delivery in many Aboriginal and Torres Strait Islander communities across the state was significantly lower than in the broader community. The initiative provided funding through local governments and private providers for 62 communities to receive maintenance, operations and repair of water supply and sewerage systems. The quality of existing infrastructure was investigated at each location and project plans developed to improve service levels to the standard expected in the wider community.

Additional examples from the USA (below) detail: the challenges for native communities in the USA (case study 6); and more broadly for sectors of the Californian community (case study 7).

The Federally funded Alaska Native Village Water Grant Program (Enviromental Protection Authority Alaska, 2021), in operation since 1996, illustrates continuing Federal government responsibility for essential services in remote extreme weather regions where populations are small and disadvantaged, and is an example of effective partnership between the federal government and the local Indigenous communities.

CASE STUDY 6: Alaskan native village water grant program- US Federal funding

Since 1996, the US Congress has provided federal funding for water and sewerage supplies for 200 remote Native Village communities in Alaska. While often paired with state-based funding it is an example of continued federal financial support. In 2020, grants totalled $US25 million. The program has relevance to our remote Australian context as towns and settlements are a considerable distance from each other, populations are small, there is a lack of trained and skilled technical staff, the climate is extreme leaving only a few months each year to complete major infrastructure programs and transport is often limited to light planes as there are few roads connecting to the capital. Many communities do not have domestic supplies of drinking water or water supplies for personal bathing, washing and cleaning. In 2000, only 2/3 small towns had access to drinking water in their own home. This rate has now reached 97% however, the program remains in place to meet maintenance and upgrades (Enviromental Protection Authority Alaska, 2021). Projects funded are identified by the Indian Health Service's Sanitation Deficiency Program and examples of successful projects announced in the 2020 Annual Report, include the Shageluk Water infrastructure system build for this small town only accessible by air. Prior to the installation of home-based drinking water taps in the 34 homes, residents had to cart water. The works will take 3 years given the small window for completing capital works due to the extreme weather (Enviromental Protection Authority Alaska, 2021). A ruling in 1999 allowed residents to include funding to cover the cost of plumbing inside homes in their applications, a necessary consideration given the low socioeconomic status of the population plus transport costs. In 1999 this was capped at $US5000 and included transport costs to the remote villages (Hudiburgh, 1999).

Elsewhere in the US (case study 7 below) the California Water Board's SAFER Drinking Water program (State Water Resources Control Board & California Enviromental Protection Board, 2021) tackles the challenging question of funding, through earmarked state funds raised through climate change taxation and positively impacts both Indigenous and non-indigenous populations.

CASE STUDY 7: The SAFER Drinking Water Fund, California Water Board: State based funding

The SAFER Drinking Water program established in 2019 in California followed the successful passage of the SAFER Bill 200 through the Senate. The Bill addresses the fact that over one million Californians do not have access to safe drinking water. Of the state's 7000 water systems, 300 do not meet drinking water health parameters, while many communities depend on 350,000 domestic private wells subject to contamination, climate change and drought (Reneria, 2022; Waterboards California, 2021). The bill addressed funding, regulatory and community engagement principles to allow communities quick and efficient access to drinking water that is environmentally appropriate. An underpinning principle of the Bill is 'environmental justice' in recognition that the burden of climate change falls heavily on marginalised low socio-economic, racial and cultural groups (Waterboards California, 2021).

The funds to support the SAFER Drinking Water program come from a Greenhouse Gas Reduction Fund and are managed by the state water board. Five percent of these funds, raised through taxation, can be used to support SAFER projects, provided the focus is on climate change reduction and directed to disadvantaged populations. Total available funds are $US130 million per year until 2030 (State Water Resources Control Board & California Enviromental Protection Board, 2021). Eligible communities include those with public water systems, state small water systems, community water systems or domestic wells that do not have adequate water, or the water is contaminated, or not fit for drinking (State Water Resources Control Board & California Enviromental Protection Board, 2021). Criteria for funding is divided into three components: priority is given to low socioeconomic groups; to communities that are prepared to consolidate small water providers into larger more efficient Utility services; or where there are serious contamination issues (Waterboards California, 2021, p. 5).

To be eligible for funding, the community water system must be accessed by a minimum of 15 residents over the entire year, and proposals must be cost effective (State Water Resources Control Board & California Enviromental Protection Board, 2021) and deliver safe drinking water. Cost effectiveness is defined as achieving sustainable results at a reasonable cost, thus the solution design is the most cost effective, not necessarily relative to low population base (State Water Resources Control Board & California Enviromental Protection Board, 2021). In this example, low socioeconomic, or disadvantaged communities are defined as ones where the median household income is less than 80 percent of the statewide annual median household income level (State Water Resources Control Board & California Enviromental Protection Board, 2021). A distinction is made in the Bill between disadvantaged populations, individual households, and communities based on income, and their exposure to climate issues and climate change impact. The Board provides detailed assistance in establishing the criteria. Small community water systems are those that service no more than 3,300 residences over the year, or where the population is under 10,000 persons (State Water Resources Control Board & California Enviromental Protection Board,

2021, p. 14). Specific support is provided to people of colour, Tribal Councils, and to those communities where the existing service has had a history of breaks in service over 3 years.

Three departments collaborate to assist communities in the preparation of their application: the Division of Safe Drinking Water; the Division of Financial Assistance; and the Division of Public Participation. Communities and Water Boards applying for grants must hold a series of resident meetings to ensure buy-in from the customers. Specialist staff are allocated by the Board to assist communities such as First Nations residents serviced by the 13 Tribal Water systems that do not meet drinking water standards, and the 128 Federally regulated Tribal Water Systems (Reneria, 2022). The process for sustained and thorough community engagement is clearly set out for all Water Boards, particularly those providing services to First Nations communities (California Water Board, 2022).

The SAFER program has allocated funds across a range of communities based on population size and movement, socioeconomic status, culture, race, and water quality and reliability. Funded projects include new mains, fire hydrants, and the decommissioning of the major well, and connections to 28 residences (California Water Board & California Enviromental Protection Board, 2020). Funds for consolation with larger more economical water providers is one of the major funding criteria. The Upper Russian River Water Agency Joint Authority in the Ukiah Valley, was created when the Calpella County Water, Willow County Water District, and the Redwood Valley County Water Districts joined forces for their 15,000 customers joined forces, to avoid water shortages as a result of the 2014 drought (California Water Board & California Enviromental Protection Board, 2018). In becoming a single water provider, they were able to draw on the strengths of all three providers with Willow staff providing all maintenance, operations and clerical services and Redwood Valley providing all administrative services (California Water Board & California Enviromental Protection Board, 2018).

Examples of successful funding go beyond the supply of infrastructure or support for amalgamations to dealing with issues of contamination. The Ceres West Mobile Home Park with 161 residents outside Ceres city had elevated levels of arsenic in its supply. The private owner was invited to prepare a feasibility study with the help of the relevant departments. The most cost effective, long term solution was to consolidate the mobile home park with the City of Ceres West (California Water Board & California Enviromental Protection Board, 2020).

A major issue confronting rural utility providers following bush fires in California is the significant movement of population away from the area following loss of homes and destruction of infrastructure. This problem faced the 3350 residents of small communities in 2015 following bush fires. In response, seven districts consolidated their water customer base into one company, the Cobb Area Country Water District. Assistance was provided by the Division of Drinking Water, the Division of Finance, and several private companies following a grant of $US21 Million (California Water Board & Cobb Area County Water District, 2021).

Provision of funds is not limited to those communities that lack potable water, or a customer base who are too poor to sustain the costs of the infrastructure and service. Water service providers who cannot deliver regular potable water or where the supply pressure is unreliable are also eligible. One example comes from the Foothill Water Treatment Plan designed for the Placer County Water Agency. The private system was subject to regular low pressure and boil water notices along with a lack of water to manage fires. Over $US3 million in funding was received to connect the supply of the 282 residents in the Castle City Mobile Home Park in Newcastle to the PCWA Water treatment facility and the Placer County Water Agency (California Water Board & PCWA, 2021).

Commentary / Analysis

Introduction

This report is written in the current context of the need to deliver on the United Nations Sustainable Development Goals; the 'refresh' of the National Agreement on Closing the Gap in Indigenous inequity; and the 2020 Inquiry of the Australian Productivity Commission into the National Water Reform. Reviewing relevant Australian and international literature identifies the need for provision of water services that are available, safe, acceptable, accessible and affordable for all communities in SA regardless of their physical location. This language comes from the UN's Office of the High Commissioner for Human Rights (OHCHR) and aspects of it are also identified in a recent DEW scoping statement.

The value of a human rights approach to water security

The notion that the continuous provision of a basic level of service for drinking water is a fundamental human right, is understood but not always mandated, including in parts of the developed world such as Australia.

The context and the policy environment, including regarding service provision and management models, are important in this discussion, in determining whether a service complies with human rights principles and standards for all members of its community. Principles of 'core obligations', 'progressive improvement' and the 'use of maximum available resources' all need to be considered in determining not only the sustainability of water services but their ability to deliver on the most basic needs of all individuals.

This tenet of *progressive improvement* is important in advancing beyond the predominantly economic narrative which in many states drives discussion of the sustainability of water services provision and it is also linked to the notion of tiered approaches to delivery of services. In SA, for example, the recent forward from the previous Minister of Environment and Water's 2022 Water Security Statement (South Australian Government & Department of Environment and Water, 2022, p. i) viewed 'water security...(as)...an essential element of

sustainable economic growth'. Viewed beyond this deterministic lens, progressive improvement considers how states can move beyond a solely economic provision to 'take stock of the current situation of human rights to water… and identify how best to achieve the highest level of services possible *for all people* from there'. Progressive improvement also importantly implies not just universal access but a *deliberate prioritised targeting of the most disadvantaged groups* and a focus on *addressing the practical challenges facing their prioritisation* (United Nations Human Rights, World Health Organization, & UNHABITAT, 2010, p. 4 Authors italics).

The language of the OHCHR is critical: it is not sufficient simply not to discriminate against certain groups or individuals, but States *must take positive measures* to include everyone *and to redress past disadvantage and reverse patterns of inequalities*. The document points out that assessing who is unserved or underserved through the lens of discrimination and equality demands policymakers address the structural causes which have created the disadvantage with comprehensive measures.

Regarding the practical challenges inherent in prioritisation, the OHCHR document states that: 'The human rights framework does not allow States to ignore the immediate needs *with promises of a long-term strategy that will eventually reach the entire population, including the most marginalized and disadvantaged individuals and communities.* The human rights framework conveys an urgency to meet and prioritize these needs.' (United Nations Human Rights et al., 2010, pp. 31, Author italics).

Approaching the provision of safe drinking water and sanitation from a human rights perspective can help to mobilise groups by informing and empowering them. This approach can also bring a different paradigm to discussions with the water sector; making the provision of safe drinking water not something to be desired for all, but as a legal entitlement, and importantly putting individuals and societies rather than economies at the centre of the debate.

While a human rights framework does not automatically resolve difficult policy issues about financing, delivery or regulation, it does provide international standards to guide political and economic decisions over the allocation of water resources; enables individuals to be heard in decision-making related to water and sanitation; and can strengthen States' accountability for the delivery of water and sanitation services, including the development of laws, policies, institutions, administrative procedures and mechanisms of redress to promote and protect access to safe drinking water (United Nations Human Rights et al., 2010, p. 15).

Considering water service provision from a human rights perspective also highlights that individuals and communities should have access to information and the ability to participate in decision-making to ensure that resultant services are relevant, appropriate and ultimately sustainable.

Of particular importance in this context is consideration of the rights of Indigenous peoples regarding water services provision in remote SA. Water is central to the traditions and culture of Indigenous peoples and thus plays a critical role in their lives, however the right to access safe drinking water addresses only a small dimension of this relationship. Access to safe

drinking water is also linked to their control over Indigenous ancestral lands and resources. To respond to this, action may be required to secure Indigenous people's rights to their ancestral lands and customary arrangements for managing water, as well as the protection of their natural resources. Indigenous peoples are often excluded from decision-making related to water and sanitation, which can act as an additional barrier undermining their access to safe drinking water and sanitation (United Nations Human Rights et al., 2010, pp. 23-24).

The OHCHR factsheet also points out that some groups or individuals have challenges exercising their right to water because of discrimination or stigma, or a combination of these factors. To protect the right to water effectively, it is necessary to pay attention to the specific situation of individuals and groups, especially those living in vulnerable situations. The factsheet points out that States should adopt *positive measures* to ensure that specific individuals and groups are not discriminated against in purpose or effect. For instance, they should tailor their water and sanitation policies *to those most in need of assistance rather than merely targeting majority groups*. States may also need to allocate financial and human resources to groups which have historically been discriminated against to ensure that they can enjoy their rights on an equal basis with other groups in society (United Nations Human Rights et al., 2010, p. 17)

Some key points pertain here regarding delegation of responsibilities to a third party and specific challenges when resources are scarce. If water services are operated or controlled by third parties, States must put in place an effective regulatory framework which includes independent monitoring, genuine public participation and penalties for non-compliance. It is implicit in this duty to regulate that the State should put this framework in place before delegating the provision of safe drinking water and sanitation. The verified trust and accountability approach to regulation recently adopted by ESCOSA needs to be capable of protecting the fundamental human rights of the most marginalised groups in SA society. When water resources are scarce, the 'right to water' carries a clear obligation for States to prioritize personal and domestic uses in their water management and allocation. In doing so, the authorities should ensure that those who do not have access, especially vulnerable and marginalized groups, have priority over those who already have access (United Nations Human Rights et al., 2010, p. 36).

Safe and reliable water supplies will also be integral to achievement of many of the health targets in the National Agreement on Closing the Gap (the Agreement), which is a commitment to improve the lives of Aboriginal and Torres Strait Islander people made by all Australian governments and the Coalition of Aboriginal and Torres Strait Islander Peak Organisations (Coalition of Peaks) (Australian Governement & Productivity Commission, 2021).

Risk Management Approaches to Drinking Water Security

The notion of 'safe water' currently being considered as part of the 'basic level of service' is a fundamental aspect of a risk management approach to security of water supplies and as such

it has important linkages to both the notion of water safety plans and the importance of source water protection, which are discussed below.

Australian Drinking Water Guidelines

The framework for the management of drinking water quality is at the centre of the Australian Drinking Water Guidelines (Australian Government, 2011), and its most recent update v3.6 (2021) comprises 12 key elements, which taken together ensure an ongoing commitment to the provision of safe water quality. The elements are: commitment; assessment; preventive measures; operational procedures and process control; verification; management of incidents; employee awareness and training; community involvement; research & development; documentation and reporting; evaluation and auditing; review and continual improvement.

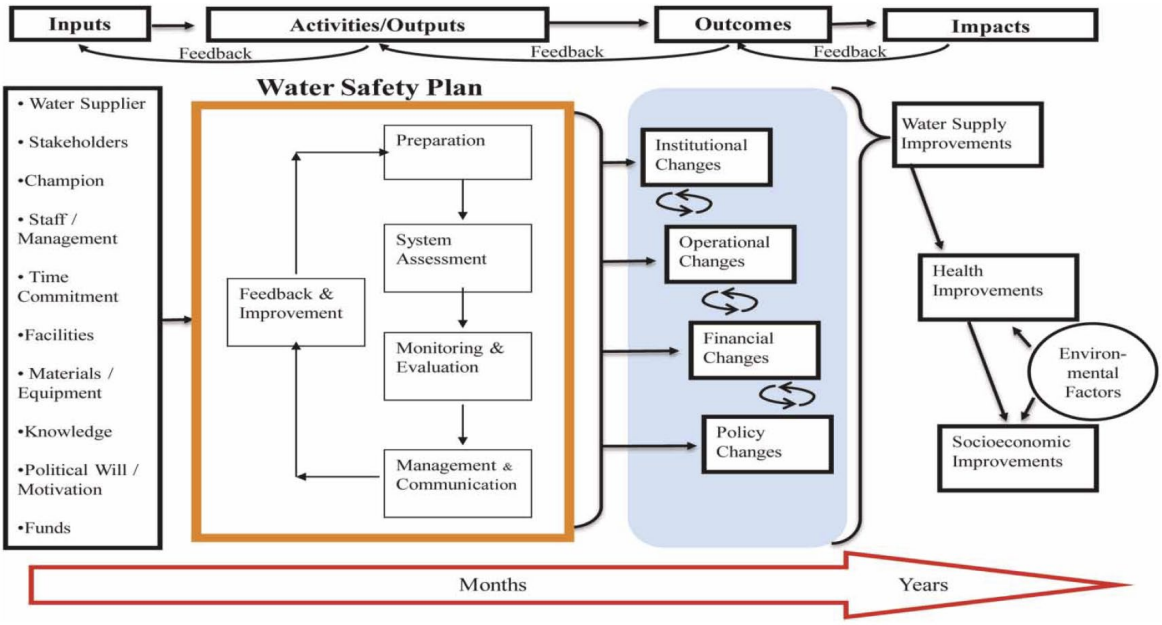
The ADWG framework is *based on a preventive, risk management approach*. The guidelines contain a chapter specifically for small supplies (Ch4) which comments that 'those responsible for small water supplies should adhere to this approach as far as possible; however, it may not be practical or necessary to implement all aspects of the Framework.' (p63). One of the major difficulties for small communities, particularly those in remote areas, is the implementation of regular monitoring programs (both in terms of cost and the practicalities of transporting samples to testing laboratories). The advantage of the Framework is that it places emphasis on a preventive approach to managing water quality, with less reliance on water testing. The principal risk to human health from drinking water sourced from surface supplies is the presence of pathogenic microorganisms. Thus, to ensure safe water, the focus in small supplies should be on regular inspection of the system to check for any direct or potential sources of contamination, and on the use of a clean and unpolluted water source. If groundwater is the source of supply, then chemical quality should be assessed as a priority. In some parts of Australia, concentrations of naturally occurring elements such as arsenic, fluoride and uranium, or nitrates from agricultural land uses, may exceed safe levels (Australian Government, 2011, pp. 63-67).

Water Safety Plans

Water Safety Plans (WSPs) are also a part of a preventive, risk management approach (Gelting, Delea, & Medlin, 2012) and are mandated by regulation in all states and territories of Australia. The World Health Organization (WHO) guidelines place WSPs within a larger 'framework for safe drinking-water' that links WSPs to health, however, many intervening factors can come between implementation of an individual WSP and ultimate health outcomes. Evaluating the impacts of a WSP, therefore, requires a much broader analysis than simply looking at health improvements. Drawing examples from existing WSPs in various regions, Gelting *et al*. outline a useful conceptual framework for conducting an overall evaluation of the various outcomes and impacts of a WSP, which can provide a common basis for implementers to objectively monitor and evaluate the range of outcomes and impacts from WSPs, as well as a common understanding of the time frames within which those results

may occur. As implementers better understand the various outcomes and impacts of WSPs beyond health, a strong evidence base for the effectiveness of WSPs will develop, further enabling the scaling up of WSP implementation and provision of better quality water, especially in remote and regional areas. (see figure 3 below).

Figure 3 Conceptual framework for water safety plans



Source Water Protection approaches

Source Water protection (SWP) is a planning process that aims to provide safe drinking water by preventing the contamination of untreated water at the source, with the underlying premise that it is more effective to avoid contamination at the source than to expend resources responding to contamination.

Necessary for water security, source water protection (SWP) requires a comprehensive policy framework with directed resources that facilitate its planning and implementation. The SWP process can include mapping, risk assessment, public education, infrastructure improvements, requiring permits for development, and the banning of potentially damaging land-use activities in designated areas. Hanrahan et al (2017) sought to understand the experience and impacts of drinking water crises at community and government levels in the decentralized context of Canada which is similar in many ways to Australia. Canada is a large federation with one of the most decentralised governance systems in the world (Hanrahan & Dosu, 2017) and a high degree of vertical and horizontal fragmentation in policy and legislation (Hill, Furlong, Bakker, & Cohen, 2008), similar to challenges found in Australia.

Hanrahan *et al.* found that while government officials in Canada tend to define water crises largely in terms of SWP, the main concern of communities was water access, specifically water shortages. Thus, while the prioritizing of SWP can be useful, its sole focus has the potential to

overlook aspects of water security, particularly in some rural and Indigenous communities in Canada. If water security is viewed as a ladder representing a hierarchy of needs, some communities are too far down on the ladder to operationalize SWP because their water shortage problems are more extreme. This commentary aligns well with challenges viewed across rural and regional areas of Australia discussed earlier.

De Loe & Murray (2013) argue that while the tools, techniques and procedures for SWP are well understood and have been documented for decades, less clear are the most appropriate ways to organize the various actors to address the challenges of SWP. Globally, responsibility for implementation of SWP measures is divided among a wide range of actors including individual land owners, private firms, municipal governments, watershed management districts, state/provincial governments and national governments. The balance of responsibilities varies from place to place reflecting the many differing political, cultural, socio-economic and institutional contexts that exist around the world and the different approaches taken highlight the kinds of governance challenges that are associated with protection of source waters. What is the role of state agencies relative to municipalities / local agencies? What is the appropriate balance among regulatory approaches versus non-regulatory approaches such as stewardship and economic incentives? They argue that potential answers to these fundamental governance questions are highly context dependent.

In a case study from Ontario Province, Canada exploring the embedded context of a novel SWP system, De Loe & Murray (2013) argue that, despite being a subnational level example, Ontario's approach has the potential to become internationally-relevant and considered for policy transfer *because it attempts to address problems that are ubiquitous in the source water protection domain in a way that reflects new ways of governing grounded in collaboration.* The authors also argue that the contextual considerations that are critical to determining the transferability of this system are rarely captured in the kinds of international evaluations of 'best practices' that are common in the water sector (e.g. Productivity Commission (Australia) or Organisation for Economic Co-operation and Development (OECD) but are critically important to ultimate success.

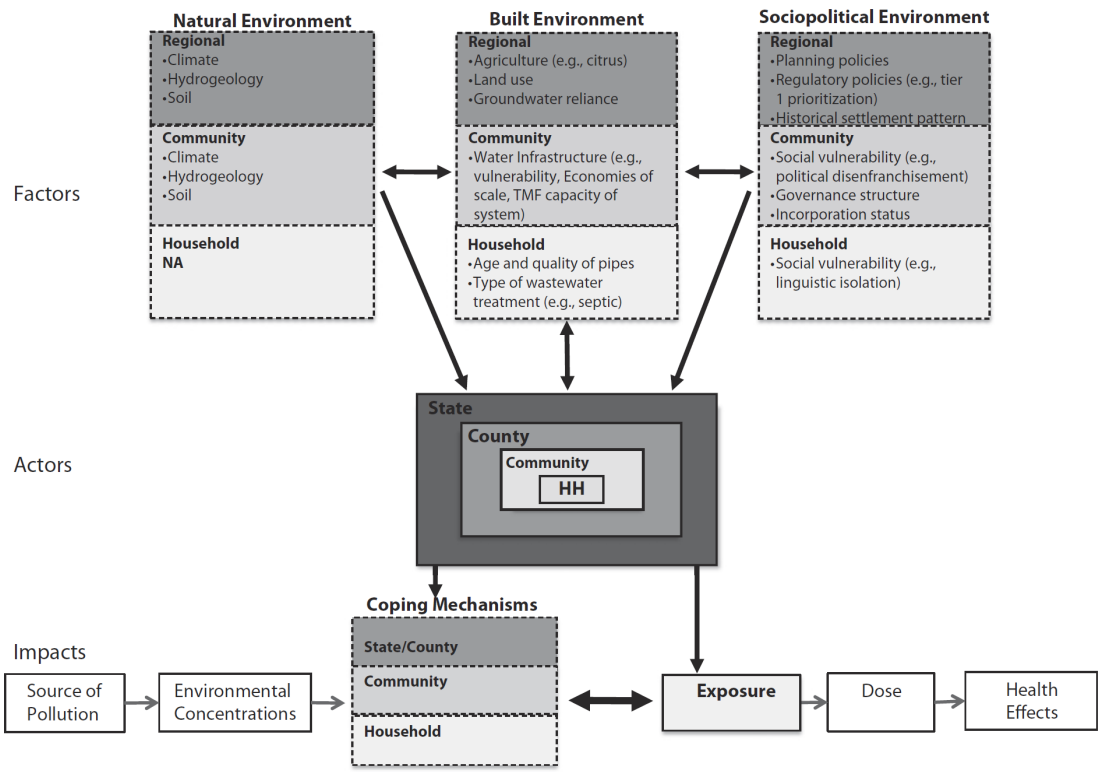
Contextual considerations: governance

A North American review (McFarlane & Harris, 2018) published in 2018 contained 117 academic articles covering almost three decades from 1990-2016 and referring to governance of drinking water in small, rural or Indigenous communities in industrialised nations. Key themes identified included: finance and funding; regulation; operational and management capacity; assessment and monitoring; governance structure; assistance and support (non-financial); equity and environmental justice; planning and management approaches; consolidation or regionalisation; system ownership; Indigenous communities; communication; and risk. Each of these themes has resonance with findings from this report.

A more geographically specific case study based in Tooleville, California (Balazs & Ray, 2014) identified a useful drinking water disparities framework highlighting 'factors, actors and impacts' which pertain to the continuation of disparities in inequality in the provision of

drinking water. The figure below shows the framework which demonstrates many similarities to the challenges posed in regional and remote SA and which may provide a useful framework for consideration.

Figure 4 Drinking water disparities framework



Note. HH = household; NA = not applicable; TMF = technical, managerial, and financial. Multilevel environmental factors act through multilevel actors to have an impact on exposure and coping capabilities. Race and class characteristics are embedded in many of the factors and actors throughout.

FIGURE 1—The Drinking Water Disparities Framework.

Contextual considerations: social and cultural

A study of Canadian Inuit resident perspectives on water systems and public health risks (Daley, Castleden, Jamieson, Furgal, & Ell, 2015) reinforces the argument for inclusion of social, cultural, and economic variables in water management planning, particularly in remote and economically challenged contexts in Canada or elsewhere around the world. The results further reinforce the notion that the addition of qualitative data about water and wastewater systems users' behaviours to technical knowledge of systems and operations can enhance the understanding of human/water interactions and be valuable in risk assessments and intervention development.

Closer to home, in a report focussed on WA, NT and northern Qld, Jackson et al (2019) propose contextual or place-specific factors including culturally informed engagement; a

partnership approach to governance; longer timelines for prioritisation; and cultural awareness training for managers as key opportunities required to improve the challenges across the top end of Australia with regard to provision of water supplies for Indigenous populations. These authors also identify learnings available from other communities as a solution to solving problems and suggest Canada and New Zealand as countries with appropriately similar contexts to ours.

In a recent paper co-authored by a number of research institutions across Canada, Global Water Futures (2019) identified the need for a federal approach to ensuring water security for all Canadians. The report identifies four key areas which need to be strengthened and which resonate with the challenges faced in Australia, some of which have begun to be resolved by initiatives including the NWI:

- Creating and mobilising knowledge (through a new Water Security Centre)
- Strengthening transboundary management and cooperative federalism (through a National Water Commission)
- Strengthening reconciliation with Indigenous peoples (by ensuring that the Canada Water Act is consistent with the UN declaration on the rights of Indigenous peoples)
- Improving collaborative water management planning (by building partnerships and identifying priorities for improvement)

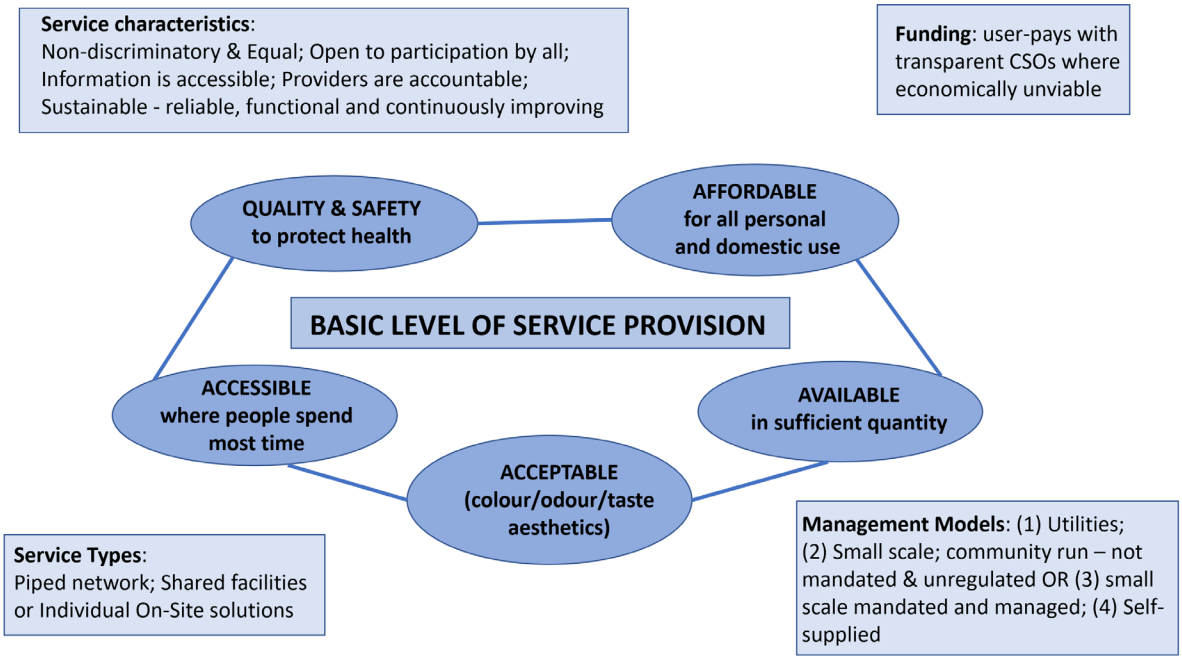
Recommendations / Next Steps

The notion of access for all to safe and reliable water provision is a fundamental requirement of a civilised and economically advanced society like Australia. The Productivity Commission (Australian Government Productivity Commission, 2021) has identified that each state and territory should set a standard for a basic level of service.

Rather than simply reflecting a safe standard of water quality and a reliable supply however, the basic level of service could take the opportunity to consider all the attributes of the human rights framework identified in the OHCHR document and outlined in the UNs SDG6. This would significantly augment the argument that Australians should be provided with water services that are available, safe, acceptable, accessible and affordable for all communities regardless of their physical location. The notion of progressive improvement could be achieved through a tiered approach to service standards, which could also highlight the need to lift up those most disadvantaged first, echoing the UN-SDGs approach.

The figure 5 below summarises the key points of the OHCHR framework and links them to the notion of a basic level of service as well as providing consideration of funding models.

Figure 5 Linking OHCHR framework with basic level of service provision



At present there is no consistent approach to the notion of what constitutes service standards across Australia, much less to the provision of a framework to ensure that they are consistently achieved in remote and regional areas. In the literature, the language of 'service standards' often pertains to customer service standards (complaints and disputes, billing and payment conditions, incident response times) rather than the long term water security service standards which are the focus of this report. This distinction is made by Qld in its Level of Service Objectives Guidelines: "The objectives are a planning tool to secure long-term water availability, whereas customer service standards provide details on 'day to day' service levels to be provided to customers and cover matters such as water quality, supply pressure and the response times for a supply issue." (Queensland Government, 2019, p. 12).

The SEQ guidelines (Queensland Government & Department of Natural Resources Mines and Energy, 2018) are probably at present the closest within Australia to an approach which SA might wish to consider. For very small supplies there may also be value in considering some of the approaches of Tasmanian Government, especially regarding aspects of linking pricing to service standards and community consultation.

The opportunity to consider a tiered approach to defining security standards and the question of how to fund appropriate standards will be examined in a future piece of work by DEW.

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Appendix A

Search strategy employed for project: basic level of water for remote communities.

Introduction

The search strategy included peer review literature, grey literature, stakeholder consultations and relevant websites/homepages. Literature searches were restricted to 2011 to 2022, and for organisational homepages and for Advanced Google only the first 10 pages were searched.

A: Peer reviewed literature

A preliminary consultation was arranged with the Flinders Librarian, Shannon Brown to establish a logic grid (Table 1) and identify the data bases best suited for retrieving relevant published research. Searches were conducted on ProQuest, and Scopus. Reports and dissertations were included, along with journal articles and downloaded, with duplicates removed. Middle developed and developing countries were excluded with the focus being, Canada, New Zealand and the USA because of their similar Indigenous populations and issues of remote service provision to areas of extreme weather and limited access to reliable and secure water. The search was completed June 6th, 2022.

A number of grey literature reports also cited peer reviewed papers and where relevant these were retrieved. The terms used for the logic grid did not capture all phrases covered in the report. For example, The Victorian Water Act (2003) refers to water that is safe to drink, and water that is regulated (and not safe to drink).

Table 1: Logic Grid date 2011-2022

Concept 1	Concept 2	Concept 3	Concept 4	Concept 5
adequate basic baseline minimum key level Reasonable standard Restricted Connection Areas Future Connection Areas. Level of service Fit for purpose Fit for place Service service standard	Service Delivery water security	Potable water	Remote Regional Rural Isolated Off grid Self-supporting Self-managed Self-supplied	South Australia New South Wales Western Australia Northern Territory Victoria ACT Tasmania Canada New Zealand USA

B: Grey literature

Grey literature was accessed via Organisational home pages, contact with stakeholders who forwarded links to relevant documents, and an Advanced Google search. The search was performed using similar phrases as for the peer reviewed literature, but with fewer terms put into the search string. File type was limited to gov. au. org. Only the first 10 pages were searched. All searches were restricted to the period 2011 to 2022.

C: Organisational web sites and home pages:

Home page web-sites are listed below in Table 2. The search function was used on all web-site homepages, using the term *Basic level of service, adequate level of service, minimum level of service, remote service, remote* and/or *Indigenous/Aboriginal service, Water supplies remote Aboriginal.* This was followed by a search of all publications listed under *Publications, Policies and Reports*, where the home page had this function. Publications deemed relevant were downloaded with the content pages reviewed for relevance. The relevant sections of the publication were read. Only the most recent annual reports were downloaded and read. Where an agency had a link to community, or media this was also searched.

Table 2: Organisations Home pages searched

ARUPP
ACT Water Icon Water
Aither Consulting
California Water Board
Centre for Remote Technology
Central Land Council
Coliban Water
Engineers Australia
Essential Services Commission SA
IAP
Infrastructure Australia
Northern Land Council
New South Wales Government
NT Government
OECD
Power and Water
Productivity Commission
Queensland Council of Social Services
Queensland Government
South Australian Arid Lands
South Australian Government
SA Water
SouthEast Queensland Water
TasWater
Victoria (Essential Services Commission Victoria)
United Nations
Unitywater

WSAA
Water Corporation, Western Australia
World Health Organization

D: Experts and stakeholders in the field

Experts in the field were contacted, informed of the project and interviewed (Table 3). They were asked for the state of play in their jurisdiction, and links to relevant documents or utility providers. The links or documents they provided were read for relevance, with an acknowledgement email sent to the expert and an additional request for further contacts to other experts in the field. Case studies were not returned to stakeholders for verification.

Table 3: List of Experts Contacted

Adam Lovell Executive Director Water Services Association of Australia
Amy Dysart Executive Director Water Resources Division Department of Environment, Parks and Water Security Northern Territory Government
Brett de Chastel UnityWater Queensland
Brett Beaton Department of the Chief Minister and Cabinet, Northern Territory
California Water Board WB-OPP-SAFER <OPP-SAFER@Waterboards.ca.gov>
Darryl Day Peter Cullen Institute Canberra
Daniel Hoefel SA Water South Australia
Danyelle Jarvis Power and Water Northern Territory
David Hughes-Owen General Manager, Service Delivery TasWater
David Sheehan

Coliban Water Victoria
Eric Vanweydeveld Director & Principal Consultant Aquanex, ACT
Phil Heaphy Senior Advisor, Water Desk Australian Productivity Commission Canberra
Matt Walsh Project Manager- Improving Power and Water in Aboriginal Communities Western Australia
Melita Stevens Melbourne Water
Ruth Dowty Customer Services Manager TasWater
Ryan Breen Director, Water Policy Conservation and Water Planning and Policy Environment, Planning and Sustainable Development Directorate ACT Government
Sarah Dennis Essential Services Commission Victoria

Appendix B

Concepts of service objectives in other essential services: telecommunications

Telecommunications are an example of another essential service, subject to challenges in remote and rural areas. Below are details (taken directly from the relevant websites and reports) which identify where similar or related challenges are pertinent to water supply provision (highlighted in italics). Two related notions are of relevance: the original Universal Service Obligation (USO) which covered voice services only and the Universal Service Guarantee (USG) which effectively replaced the USO in 2018 and which covers broadband as well as voice services (Australian Government & Communication & Arts, 2018, p. 6).

Telecommunications Universal Service Obligation (USO)

The Telecommunications Universal Service Obligation (USO) protects customers' access to voice services. *Wherever people live or work, they must have reasonable and equal access to these services.* As Australia's main service provider, Telstra still delivers the USO. They are required to provide standard telephone services and access to payphones, although these are gradually being phased out. The Department of Infrastructure, Transport, Regional Development, Communications and the Arts monitors how Telstra meets the USO, which is legally required under the Telecommunications (Consumer Protection and Service Standards) Act 1999 (Australian Communications and Media Authority Home Page, 2022 (Updated July)-a) .

Australian Communications and Media Authority (ACMA) is an independent government agency managed by an executive team comprising the Chair (who is also the Agency Head), Deputy Chair (who is also the chief executive officer). ACMA collects revenue on behalf of the Australian Government through broadcasting, radiocommunications and telecommunications taxes, charges and license fees. It also collects revenue from price-based allocation of spectrum. The corporate structure comprises four divisions – Communications Infrastructure, Content, Consumer and Citizen, Corporate and Research, and Legal Services.

ACMA has responsibilities under four principal Acts – the Broadcasting Services Act 1992, the Telecommunications Act 1997, the Telecommunications Act 1999 and the Radiocommunications Act 1992 (Consumer Protection and Service Standards)

Many of the controls on the production and distribution of content and the provision of telecommunications services through licensing or other subsidiary arrangements, or by standards and codes (whether co-regulatory or self-regulatory) are subject to revision and adaptation to the networked society and information economy. Moreover, there are new platforms, applications, business models, value chains and forms of social interaction available in what is a dynamic, innovative environment. *Other challenges for regulators include cross-jurisdictional issues and the need for engagement and collaboration with stakeholders locally, regionally and internationally*.

ACMA has developed a 'converged communications regulator' framework which seeks to bring to the global discussion a 'common ground' to deliver outcomes in the public interest. There are four cornerstone parts to the framework covering the main functions of ACMA: these are labelled: Bridging to the future; Transforming the agency; Major program delivery and Effective regulation.

Effective regulation involves resolving competing *demands for spectrum through broadcasting license arrangements and price-based allocation methods* and promotes and facilitates communications interference; regulating compliance with the relevant legislation, license conditions, *codes of practice, standards, service guarantees and other safeguards*; *promoting and facilitating industry self-regulatory and co-regulatory solutions and informing industry and consumers about communications regulation*.

Since the USO was established, there have been significant changes in technology, the marketplace and customer preferences. There has been increasing use of data and greater use of mobile services, contrasting with falling use of fixed line voice and payphone services. The Government has also made a significant investment in the NBN to improve broadband nationally and the private sector has invested heavily in mobile infrastructure, supplemented by additional investment by government and community organisations to address mobile blackspots. The 2015 Regional Telecommunications Review (RTR) called into question the existing USO and recommended a new Consumer Communication Standard for voice and data that would provide technology neutral standards of availability, accessibility, affordability, performance and reliability (Australian Government & Communication & Arts, 2018, p. 7).

In response to the 2015 RTR, the Government asked the Productivity Commission (PC) to inquire into the future of the USO. The PC concluded that the USO arrangements were 'anachronistic and costly' and recommended they be replaced as soon as possible with a new modern approach that covered broadband as well as voice, and leveraged the NBN and other commercial networks, like mobile, to the greatest extent possible. In December 2017, in response to the PC's report, the Government announced it would commence work to develop a new USG policy. The USG would modernise the USO by guaranteeing access to broadband as well as voice services for all Australian premises, while providing ongoing access to community phones or payphones, where appropriate. The Government indicated that four prerequisites would need to be met before any changes would be made to the existing USO, namely that:

(1) broadband services would need to be available to 100% of Australian premises, on request, at the completion of the NBN rollout in 2020
(2) voice services would need to be available to 100% of Australian premises on request
(3) any proposed new service delivery arrangements would need to be more cost effective than the existing USO contract (including any transitional costs)
(4) a new consumer safeguards framework would need to be in place, following a review and associated public consultation process The Government also indicated that the USG would make use of the NBN and other commercial networks, such as mobile networks, in keeping with the Government's preference for commercial solutions.

Current USO arrangements would remain in place until these prerequisites could be satisfied (Australian Government & Communication & Arts, 2018, pp. 7-8).

Universal Service Guarantee (USG)

The Universal Service Guarantee (USG) was established in 2021 by the Commonwealth Government's Department of Infrastructure, Transport, Regional Development and Communications (ITRDC) as a new guarantee to give all Australians access to broadband as well as voice services.

It covers broadband services; standard telephone services; payphones; mobile services and government funding arrangements (Australian Governement & Department of Infrastructure, 2021). There are a number of similarities between telecom and water services. These are highlighted below (in italics).

Broadband services

NBN Co. provides broadband infrastructure to premises across Australia using fixed line (92% of its network), fixed wireless (5% of its network) and satellite technologies (3% of its network). In 2020 the National Broadband Network (NBN) was treated as built and fully operational. This means that in all but limited cases, all premises across Australia could order NBN services through their preferred retail service provider. As of June 2021, just under 12 million premises were within NBN's footprint and there were around 8.2 million active services. *New Statutory Infrastructure Provider (SIP) obligations* commenced on 1 July 2020, making NBN Co the default wholesale provider of broadband services nationally. *Other telecommunications companies can also be SIPs and are often contracted to perform the role in new real estate developments in or on the edge of our cities*. SIPs must ensure broadband infrastructure is available on reasonable request so retail service providers can provide services to their customers. SIP services delivered over fixed line and fixed wireless must be capable of supporting voice services. *Standards, rules and benchmarks to further define SIPs operational performance and protect consumers are currently being considered*.

Standard Telephone Services (STS)

The USG incorporates the old Universal Service Obligation (USO). Under the USG, Telstra must provide fixed voice services to premises in Australia on reasonable request. Telstra now provides the majority of these services over NBN Co's fixed line network, mainly in urban areas, in much the same way as other competing service providers. Outside NBN Co's fixed line footprint, Telstra must still provide its own infrastructure where needed, and must maintain its copper network outside NBN Co's fixed line footprint until 2032. In June 2021, Telstra infrastructure supported around 440,000 fixed voice services outside the NBN fixed line footprint. Most of these Telstra services outside the NBN fixed line footprint continue to be provided over copper landlines, but around 17,000 voice services were provided using terrestrial wireless technologies and around 1,000 voice services were provided using satellite. *Access to the STS is supplemented by the Customer Service Guarantee (CSG) which sets connection, repair and appointment timeframes; the Network Reliability Framework, which monitors service availability and faults and requires remediation of poorly performing*

services; and Priority Assistance for people with life-threatening medical conditions. ADSL broadband is also provided as a commercial legacy service on around 176,000 (44%) of the Telstra copper services in regional Australia.

Mobile Services

Mobile services are provided commercially and are not included in the USG because of the difficulty of providing mobile service 'universally', that is, everywhere in Australia, no matter how remote, sparsely populated or untravelled. Australia's world class mobile services nevertheless reach 99.5% of the population and cover around 33% of our landmass. Mobile services via satellite are also available nationally. Coverage has expanded under the Government's $380 million Mobile Black Spots Program (MBSP). In June 2021, 938 MBSP base stations had been completed across the country. Through the MBSP, the Government's commitment has generated a total investment to date of more than $875 million (GST inclusive) including co-contributions from local, state and territory governments, mobile network operators and community organisations, funding a total of more than 1,270 new mobile base stations across Australia. There are a number of other federal and state government programs that complement the MBSP by targeting specific mobile coverage issues, for example, the Australia Government's Peri-Urban Mobile Program is targeting mobile connectivity issues in bushfire prone areas on the peri-urban fringe of Australia's major cities, and the Mobile Network Hardening Program is improving the resilience of regional and remote mobile network infrastructure.

Funding

Under the USG, Telstra is paid $270 million per annum (GST exclusive) to provide USG services – $40 million for payphones, and $230 million for fixed voice and copper continuity. This amount in not indexed, meaning its value declines in real terms over time. It is tied to the broad obligations on Telstra, not the number of services provided. The Commonwealth contributes $100 million per annum, industry contributes the remainder on a pro-rata basis. Telstra contributes the most due to its size and revenue – $96.8 million in 2019-20, followed by Optus ($34.9 million), TPG ($21.9 million), NBN Co ($11.17 million) and others ($5.1 million). The Regional Broadband Scheme has been legislated to support the delivery of NBN Co fixed wireless and satellite broadband services. The first full year under the scheme (2021–22) is expected to raise around $750 million and this amount will grow across the future years of the scheme (Australian Governement & Department of Infrastructure, 2021).

Statement of Expectations and Statutory Infrastructure Provider obligations

The Statement of Expectations to NBN Co, or SoE, provides guidance to NBN Co on the Government's expectations for the rollout of the NBN. The SoE ensures that NBN Co's strategic direction aligns with the Government's objectives for delivery of the network and specifically *requires that all Australian premises have access to very fast broadband at affordable prices*.

In addition to the SoE, the Statutory Infrastructure Provider (SIP) legislation, currently before Parliament, will require NBN Co (and other carriers, as appropriate) to provide the necessary

infrastructure to ensure all Australian premises are able to access broadband services offering peak wholesale download speeds of at least 25 Megabits per second (Mbps) and upload speeds of at least 5 Mbps. Subject to the Parliament passing this legislation, NBN Co will become the default SIP, with a legal obligation to connect premises and supply wholesale broadband services on reasonable request. Under the SIP regime, broadband services provided on fixed line and fixed wireless networks will also have to support voice services for consumers. The remaining 3% of premises located in areas served by the NBN Sky Muster satellite service require voice solutions over alternative infrastructure because of the technical limitations of these satellites in delivering acceptable voice services. The Regional Broadband Scheme (RBS) will provide funding support for NBN Co's SIP obligations by establishing a long term funding mechanism for NBN Co's fixed wireless and satellite networks. It will level the playing field between NBN Co and its fixed line competitors by requiring all high-speed fixed line carriers, including NBN Co, to contribute to the cost of providing high speed broadband access to regional Australia. The RBS is before the Parliament alongside the SIP legislation as part of the Government's Telecommunications Reform Package (Australian Government & Communication & Arts, 2018, pp. 7-8).

SIP obligations

The Telecommunications Act 1997 sets out connection and supply obligations on the Statutory Infrastructure Provider (SIP) of a service area (Australian Communications and Media Authority Home Page, 2022 (Updated July)-b).

The SIP rules provide certainty that all premises around Australia can be connected to superfast networks. This allows consumers to receive superfast broadband and voice telephone services. Connection and supply obligations guarantee that retail service providers (RSPs) can gain wholesale access to superfast broadband infrastructure.

In December 2020, the Minister declared that the national broadband network is built and fully operational, which means NBN Co is now the default SIP for the general service area. This is all of Australia, except nominated service areas or designated service areas where other carriers will be the SIPs. The Minister can also declare a 'designated service area' and specify which carrier is the SIP for that area. A SIP for a service area has two main obligations:

(1) connect premises to its networks
(2) supply an eligible service to consumers.

RSPs are responsible for arranging to connect and supply services on behalf of their customers. Sometimes it may not be reasonable for the SIP to connect premises to a fixed-line network. In this case, it must provide fixed-wireless or satellite technology at certain upload and download speeds. SIPs must publish their terms and conditions for providing wholesale services to RSPs on their website. The terms and conditions must include:

(1) a price, or a way to find out the price, of connecting and supplying services
(2) the maximum period to connect and supply services
(3) the maximum period for repairing a fault or service problem
(4) any other relevant terms and conditions (Australian Communications and Media Authority Home Page, 2022 (Updated July)-b).

Service to remote consumers

Where providing a service to a remote consumer means that the consumer would face what was more than the generally available price, for example, because additional equipment was required, or satellite usage costs were high, those prices would need to be subsidised, so they were in line with prices generally available across Australia. The proposal is that service providers would meet installation costs in the first instance and could be entitled to subsidies as a result. The subsidies could be reflective of the difference between the cost of supply and the generally available price payable by consumers. Subsidies would be capped to reflect reasonable costs of supply and to prevent gold-plating at the taxpayers' expense. Subsidies would be aggregated and invoiced to the Commonwealth periodically. There would be appropriate fraud prevention mechanisms. In the first instance, funding would be on a similar basis to current USO funding arrangements. Another approach would be to tender for the supply of services on a per-area and/or per-technology basis, for example, for the supply of services in a particular region or the supply of satellite services nationally. This might be done to provide economies of scale for suppliers, clarity for consumers and to reduce administrative costs. For example, offering and managing a contract for an extended service area may involve less administrative costs than operating a per-service scheme. Generally, this option is seen as less attractive as it would reduce consumers' choice and dynamic competition. However, it may be necessary to ensure services are available in an area and it may be more efficient to administer than a per-service scheme. These models would need to be developed further in the event the Government decides to move in this direction (Australian Government & Communication & Arts, 2018, p. 20).

Regarding comparisons with other key countries on telecommunications services, the paper (Australian Government & Communication & Arts, 2018, p. 19). noted that as a developed country with a relatively large proportion of people living in urban areas, and an important, but relatively small, regional population spread over a vast area, there are few countries which offer a close comparator for Australia. Noting there are significant differences, they argued that Canada is perhaps the most comparable.

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