

Review of Essential Energy's prices for water and sewerage services in Broken Hill

From 1 July 2019

Issues Paper Water Pricing

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Tribunal Members

The Tribunal members for this review are: Dr Peter J Boxall AO, Chair

Mr Ed Willett Ms Deborah Cope

Enquiries regarding this document should be directed to a staff member:

Anthony Rush (02) 9113 7790 Xuan Deng (02) 9113 7751 Ian Dehlsen (02) 9113 7769

Invitation for submissions

IPART invites written comment on this document and encourages all interested parties to provide submissions addressing the matters discussed.

Submissions are due by 30 October 2018

We would prefer to receive them electronically via our online submission form <www.ipart.nsw.gov.au/Home/Consumer_Information/Lodge_a_submission>.

You can also send comments by mail to:

Essential Energy price review 2019 Independent Pricing and Regulatory Tribunal PO Box K35 Haymarket Post Shop NSW 1240

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1 Introduction

The Independent Pricing and Regulatory Tribunal of NSW (IPART or we) is reviewing the maximum prices that Essential Energy can charge for water and other services it provides through its Essential Water business.¹ Essential Water provides these services to customers in Broken Hill and the surrounding areas of Menindee, Sunset Strip and Silverton. We will determine maximum prices for:

- water supply services
- sewerage services
- trade waste services, and
- a range of its miscellaneous and ancillary services.²

For this review, we will pay particular attention to the social impacts of our decisions, especially what customers can afford to pay. This is because setting prices to reflect total efficient costs might make services unaffordable for customers.

In our last review, we set maximum prices for Essential Water from 1 July 2014 to 30 June 2018 (the 2014 determination period). These prices apply until 30 June 2019, because we deferred setting prices until the cost implications for Essential Water of the Murray River to Broken Hill Pipeline (Broken Hill pipeline) were clearer.³

In the current review, we will set maximum prices from 1 July 2019 for a period of up to five years (the 2019 determination period). This chapter explains what the review will involve – including our objectives and proposed approach for making pricing decisions, Essential Water's pricing proposal, and the key issues that we will consider. It also outlines how we will conduct the review, including how stakeholders can provide input, sets out our preliminary views where we have them and our questions for stakeholder comment.

1.1 What are our objectives in setting Essential Water's prices?

In general, when we set prices for a regulated business like Essential Water, we aim to set costreflective prices – that is, prices that will generate enough revenue to recover the **total efficient cost** that the business is forecast to incur in supplying the regulated services to its customers over the determination period, and in maintaining its viability over the long term. Costreflective prices create incentives for the business to supply its services as efficiently as possible, and encourage customers to use the services efficiently.

We must also consider the matters set out in section 15 of IPART Act (Appendix A). Section 15 requires that in setting prices, we must balance the needs and interests of the business, its customers and other stakeholders, having regard to the costs of providing the services, and

¹ All references to Essential Energy are to its water business, Essential Water, unless otherwise stated.

² We propose to defer regulating prices for any recycled water services Essential Water provides until the next review of its water and wastewater services (see section 10.9).

³ For more information, see: IPART, *Broken Hill Water and sewerage services price review deferred*, Media Release, 14 November 2016.

the impact of our decisions on the standard and price of services for customers and the environment.

For this review, we will pay particular attention to what prices customers can afford to pay. The efficient cost of supplying water and sewerage services in Essential Water's area is relatively high (given its arid location and long distance from available water sources), while its customer base is relatively small. As a result, setting prices to reflect the total efficient cost might make services unaffordable for customers.

1.2 What approach will we use to set prices?

Given the above objectives and considerations, our proposed approach for this review involves:

- establishing the total efficient cost of providing water and sewerage services to Essential Water's customers
- deciding what share of these costs should be notionally allocated to Essential Water's customers, and
- deciding what share of costs notionally allocated to customers should actually be recovered from customers, taking into account factors such as what customers can afford to pay.

Our proposed approach for deciding on the share of costs to be recovered from customers via prices is summarised in Figure 1.1 and discussed further in Chapter 3.

Figure 1.1 Framework for establishing efficient costs and setting affordable prices



To establish the total efficient cost, we propose to estimate three cost components separately:

- 1. **The cost of purchasing bulk water.** This cost will be based on the maximum prices WaterNSW can charge its customers, including Essential Water, for rural bulk water supply services. These prices are set out in our 2017 Determination of rural water prices.⁴ Therefore, in this review, we will use these regulated prices.
- 2. The cost of transporting bulk water through the Broken Hill pipeline. WaterNSW is building a new pipeline from the Murray River to Broken Hill to supply the town and surrounding areas with a reliable source of water.⁵ The pipeline is expected to be operational by late 2018.

The cost of transporting bulk water will be based on the maximum prices WaterNSW can charge for use of the pipeline. We are currently reviewing these prices, as part of a separate WaterNSW pipeline review that will assess the efficient construction, maintenance and operating costs of the pipeline.⁶ We will use the regulated price from the concurrent WaterNSW pipeline review in the Essential Water review.

3. The operating and capital expenditure Essential Water incurs to provide water and sewerage services to its customers (in addition to components 1 and 2). This includes expenditure on refurbishing reservoirs, upgrading water and sewerage treatment plants, and renewing water mains and reticulation pipes. It also includes the cost of any capital works required to service customers as a result of the Broken Hill pipeline. (These works are referred to as consequential works in this Issues Paper.) We will assess the efficient level of these costs.⁷

After establishing the efficient cost in this review, and the customers' notional share of this efficient cost, we will then set prices that consider Essential Water's customers' capacity to pay. This will include a quantitative and qualitative assessment of what customers can afford to pay.

In addition to establishing the total efficient cost and what share of this cost should be recovered through water and sewerage prices, we will follow our standard price setting approach. This will involve considering and deciding on:

- the number of years we should set prices for (the length of the determination period)
- the form of regulation and other mechanisms we should use (particularly mechanisms to share risk between Essential Water, its customers and other stakeholders such as the Government)
- Essential Water's forecast customer numbers and these customers' forecast demand for water and sewerage services over the determination period
- the structure of Essential Water's prices (for example, the balance between fixed service charges and variable usage charges), and

⁴ IPART, Review of prices for WaterNSW rural bulk water services from 1 July 2017 to 30 June 2021 – Final Report, June 2017. Available at https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WaterNSW%e2%80%99s-Rural-Bulk-Water-Services-from-1-July-2017-formerly-State-Water-Corporation?qDh=3

⁵ Available at: https://www.waternsw.com.au/projects/wentworth-to-broken-hill-pipeline

⁶ Available at: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WaterNSW%e2%80%99s-Murray-River-to-Broken-Hill-Pipeline-services-from-1-July-2019

⁷ If a Government contribution is confirmed for any portion of these costs, we would assess the efficient level of costs net of this contribution.

• the implications of our pricing decisions on stakeholders.

1.3 What has Essential Water proposed?

We asked Essential Water to submit a pricing proposal for the 2019 determination period, which we received on 13 July 2018.⁸ We propose to consider this proposal, along with stakeholder comments and our own analysis in making our pricing decisions. We will also appoint an expert consultant to review the prudency and efficiency of Essential Water's proposed costs. The Essential Water proposal is available on our website,⁹ and is summarised below.

1.3.1 Increased revenue requirement

Essential Water has proposed that it requires \$100.1 million (\$2018-19) in revenue from customers over a 4-year determination period (its Notional Revenue Requirement (NRR)). On average, this is \$25 million per year, which is around 9.6% higher than its forecast revenue from customers in 2018-19 (\$22.8 million).

However, in estimating this proposed NRR, Essential Water has not included the full costs of providing water and sewerage services to its customers over the next four years. Specifically, Essential Water has not included:

- the cost of transporting bulk water through the Broken Hill pipeline, or
- the cost of consequential works that Essential Water considers are needed as a result of the Broken Hill pipeline. These consequential works are proposed to be around \$59 million.

Our preliminary analysis suggests that if these costs were included (in line with our proposed approach), Essential Water's proposed NRR would be around \$236 million over the next four years, or \$59 million a year on average (Figure 1.2).

⁸ Essential Water also submitted an addendum to its pricing proposal on 3 September 2018. This addendum presents revised prices, following corrections in the pricing model. The addendum is available at: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-Essential-Energy%e2%80%99s-water-and-sewerage-services-in-Broken-Hill-from-1-July-2019?gDh=3

⁹ Available at: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-Essential-Energy%e2%80%99s-water-and-sewerage-services-in-Broken-Hill-from-1-July-2019?qDh=3



Figure 1.2 Essential Water's Notional Revenue Requirement

Note: This figure excludes the costs for the final section of the Broken Hill pipeline, from the final pumping station to Essential Water's existing water network. This is referred to as the "SP2" portion of the project. These costs have been excluded because Essential Water expects these costs to be directly funded by the NSW Government and 'gifted' to Essential Water. **Source:** Essential Water pricing proposal to IPART, July 2018; WaterNSW pricing proposal to IPART, June 2018; IPART analysis.

1.3.2 Increased water and sewerage prices

Essential Water has proposed to increase water and sewerage prices, and maintain its current price structure (the balance between fixed and variable charges), including separate charges to the mines (see Chapter 10 for more information).

Under its proposed prices, ¹⁰ Essential Water estimates that water and sewerage bills for:

- A typical residential customer, consuming 200kL of water per year, would increase by an average of 6.8% per year, including inflation (or a 4.2% per year increase in real terms). This is an additional \$93 per year average, including inflation (see Table 1.1).
- A typical non-residential customer, consuming 2,100kL of water per year, would increase by an average of 6.8% per year, including inflation (or a 4.2% per year increase in real terms). This is an additional \$770 per year on average, including inflation (see Table 1.2).

Table 1.1 and Table 1.2 also show the estimated bills for other types of residential and nonresidential customers, including pensioners, chlorinated water customers, and untreated water customers.

¹⁰ Essential Water submitted an addendum to its pricing proposal on 3 September 2018. This addendum presents revised prices, following corrections in the pricing model. The addendum is available at: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-Essential-Energy%e2%80%99s-water-and-sewerage-services-in-Broken-Hill-from-1-July-2019?qDh=3

Table 1.1Impact of proposed prices on typical residential bills (\$ nominal – ie, with
inflation)

	2018-19	2019-20	2020-21	2021-22	2022-23	Chan	ge 2018-19 to 2022-23
	\$/pa	\$/pa	\$/pa	\$/pa	\$/pa	\$	%
Treated water and	sewerage						
Water bill (for 200kL of treated water)	688	735	785	839	896	209	30.3%
Sewerage bill	536	572	612	653	698	162	30.3%
Non-pensioner water and sewerage bill	1,223	1,307	1,397	1,492	1,595	371	30.3%
Pensioner rebate	(175)	(175)	(175)	(175)	(175)		
Pensioner water and sewerage bill	1,048	1,132	1,222	1,317	1,420	371	35.4%
Chlorinated and un	Chlorinated and untreated water						
Water bill (for 200kL chlorinated water)	560	598	639	683	729	170	30.2%
Water bill (for 200kL untreated water)	484	517	552	590	630	147	30.2%

Note: Colmns may not sum due to rounding

Source: Essential Water pricing proposal to IPART, Addendum, September 2018.

Table 1.2Impact of Essential Water's prices on typical non-residential bills (\$ nominal
– ie, with inflation)

	2018-19	2019-20	2020-21	2021-22	2022-23	Chang t	Change 2018-19 to 2022-23	
	\$/pa	\$/pa	\$/pa	\$/pa	\$/pa	\$	%	
Treated water and se	ewerage							
Water and sewerage bill ^a (2,100 kL/year usage)	10,149	10,845	11,588	12,382	13,230	3,081	30.3%	
Untreated water								
Water bill ^b (1,000kL/year usage)	1,292	1,380	1,475	1,576	1,684	392	30.3%	

a Assumes a 20mm meter and a 70% sewerage discharge factor.

b Assumes a 25mm meter.

Source: Essential Water pricing proposal to IPART, Addendum, September 2018.

Essential Water's proposed prices are based on its proposed NRR which, as discussed above, does not include the full costs of providing services to its customers. Essential Water excluded the costs of transporting bulk water via the Broken Hill pipeline and consequential works from its proposed prices. In contrast, we propose to include all costs in our estimate of the

total efficient cost, ¹¹ and then make a separate decision on what share of this cost customers should pay. We prefer this approach as it is more transparent, and provides stronger incentives for Essential Water to improve the efficiency of its expenditure on its existing network. This is discussed further in Chapter 3.

1.3.3 Lower operating expenditure

Essential Water has proposed operating expenditure of \$57.3 million over the 4-year period. This is \$1.6 million (2.7%) less than the operating expenditure we allowed for in the 2014 determination period. This cost saving is driven by Essential Water no longer needing to pump water through the Menindee pipeline, although we note that this cost was not quantified.

As noted above, Essential Water's proposed operating expenditure does not include the cost of transporting bulk water via the Broken Hill pipeline. Our preliminary analysis¹² suggests if this cost were included, the proposed operating expenditure would roughly triple.

1.3.4 Higher capital expenditure

Essential Water has proposed capital expenditure of \$65.7 million over the 4-year period. This is \$23.1 million (54%) more than we allowed for in the 2014 determination period. The main driver of the increase is the proposed replacement of a wastewater treatment plant (\$34.3 million, including overheads).

As noted above, Essential Water's proposed capital expenditure does not include the cost of consequential works associated with the pipeline. Our preliminary analysis suggests if this cost were included, total proposed capital expenditure would be \$123.2 million.

1.3.5 Decreased customer numbers and water demand

Essential Water has forecast water and sewerage customer numbers to decline by 1% per year, in line with trends in the Broken Hill population, and total water demand to fall by 0.4% per year. It has also assumed no new mining customers during the 2019 determination period and no increase in demand from existing mining customers.

1.3.6 Proposed risk sharing mechanisms

Essential Water has proposed that we set maximum prices, and that we include two mechanisms to manage risks to revenue and costs:

- 1. A demand volatility adjustment mechanism, with a ±5% materiality threshold.
- 2. A cost pass-through mechanism, with four proposed cost past-through events.¹³

¹¹ If a Government contribution is confirmed for any portion of these costs, we would assess the efficient level of costs net of this contribution.

¹² Based on WaterNSW's proposed costs for constructing, operating and maintaining the Broken Hill pipeline.

¹³ The four events are: regulatory change, drought relief, Broken Hill pipeline and consequential works.

A demand volatility adjustment recognises that there is some risk in setting prices based on forecast water sales. If actual water usage is higher (or lower) than our forecasts, the prices we set could over-recover (or under-recover) Essential Water's revenue requirement. Under Essential Water's proposal, its revenue requirement would be adjusted in the following determination period if actual water usage was more than 5% above or below our forecasts over the 2019 determination period.

A cost pass-through mechanism recognises that there are risks that costs may be different to forecasts, and seeks to mitigate these risks. Essential Water has proposed that if the costs of the Broken Hill pipeline and the consequential works are not funded by the Government (as its pricing proposal assumes), some or all of these costs would be passed through to customers.

1.4 What are the key issues for this review?

While we will consider a wide range of issues as part of this review (see section 1.7 below), at this stage we consider the following five issues are the most important:

- 1. Establishing the prudent and efficient costs of supplying water to Essential Water's customers. We will investigate what costs are prudent and efficient to deliver an appropriate standard of service to Essential Water's customers. The new Broken Hill pipeline is designed to deliver a secure long-term water supply to Broken Hill customers, and will drive significant changes to Essential Water's existing water operations (see Section 2.2 for more information). For example, some costs of operating and maintaining the existing Menindee pipeline will no longer need to be incurred. But, some additional expenditure may be required (consequential works). Essential Water has proposed significant capital expenditure (\$65.7 million, excluding consequential works), and only a small reduction in operating expenditure over the 2019 determination period. We will need to assess the prudent and efficient level of operating and capital expenditure, taking into account the implications of the Broken Hill pipeline on Essential Water's existing operations.
- 2. Assessing what prices customers can afford to pay when determining the share of Essential Water's efficient costs that should be paid by its customers. As section 1.2 discussed, we propose setting prices to recover customers' share of Essential Water's total efficient cost. To determine this share, we will first consider what share of costs should be notionally allocated to customers. We will then determine what share of these costs customers should actually pay through prices, taking into account factors such as what customers can afford to pay (see Section 3.3 for more information).

- 3. Deciding whether and what mechanisms are required for sharing risks between WaterNSW, Essential Water, Essential Water's customers, and the Government. When we set prices, there is a risk that costs are different to our forecasts, and revenue is under or over-recovered. These risks could be shared between WaterNSW, Essential Water, its customers and the NSW Government (depending on the source of those risks, and whether we consider a Government contribution is needed). Essential Water has proposed four cost pass-through events to deal with cost and revenue risks (see section 4.5). We will consider what pass-through events, if any, are required, and whether a Government contribution could be designed to reduce cost and revenue risks to Essential Water and its customers.
- 4. Forecasting water demand may be difficult. We need to decide on Essential Water's forecast water sales, customer numbers and sewerage volumes in order to calculate water and sewerage prices (see Chapter 9 for more information). If our forecasts differ markedly from Essential Water's actual sales, it would under or over-recover its required revenue over the determination period. Forecasting water demand in Broken Hill is difficult because recent water usage may not be a good guide of future consumption, given the impact of water restrictions, and to the extent that the new Broken Hill pipeline delivers a more reliable source of water. We will also investigate why Essential Water and WaterNSW have proposed different water sales forecasts.
- 5. **Deciding if different price structures are appropriate for different services or customers.** Essential Water has proposed nearly uniform increases for all services across its geographical areas. We will consider whether this is appropriate, taking into account the costs of providing services.

1.5 How can stakeholders provide input into this review?

Stakeholders will have multiple opportunities to express their views during this review, including by:

- making a submission in response to this Issues Paper and Essential Water's pricing proposal by 30 October 2018
- attending the public hearing on **20 November 2018**, and
- making a submission in response to our Draft Report.

We will consider all stakeholder feedback we receive before making draft and final decisions. We will also engage expert consultants to assist us in reviewing Essential Water's operating and capital expenditure proposals.

We invite all interested stakeholders to make a submission to this review. Details about how to make a submission are included at page iii above. Figure 1.3 sets out an indicative timetable for the review. We may provide an updated timetable on our website as the review progresses.



Figure 1.3 Timeline for this review

1.6 Structure of this Issues Paper

The remainder of this paper discusses the review, our proposed approach and the issues we will consider in more detail. It is structured as follows:

- Chapter 2 outlines the key context for the review, including Essential Water's operations, and how this review relates to other recent or concurrent pricing reviews.
- Chapter 3 sets out our proposed approach for setting efficient and affordable prices.
- Chapter 4 discusses the decisions we will make before setting prices, such as the length of the determination period, our approach to calculating the revenue requirement, the form of regulation, and risk sharing mechanisms.
- Chapters 5 outlines Essential Water's proposed notional revenue requirement and our preliminary views on its proposal.

- Chapters 6 through 8 discuss the components of the building block approach we use to calculate the notional revenue requirement.
- Chapter 9 discusses forecast water sales and customer numbers.
- Chapter 10 sets out Essential Water's proposed prices for water, sewerage and other prices, and our preliminary views.

1.7 Our preliminary views and questions for stakeholder comment

Throughout this paper, we have set out our preliminary views (where we have them) and the questions on which we particularly seek stakeholder feedback. For convenience, these views and questions are also listed below. Stakeholders are welcome to comment on any of these views and questions, and raise other issues they consider relevant to this review.

1.7.1 Preliminary views

Page no.

1	Setting prices that customers can afford is likely to be a key concern in this review, we should conduct a quantitative and qualitative assessment to ensure the prices w set are affordable for customers.	and /e 40
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3	That, if a government funding contribution is appropriate, we will consider the poten structure of this contribution and its effect on the risks faced by Essential Water in setting the gearing ratio.	tial 79
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5	That we should continue to charge houses and apartments the same water service charge.	95
6	That we should remove or reduce the sewerage bill differential between non-resider and residential customers.	ntial 98
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	assessing what each group can afford?	10		
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2 Context for the review

This chapter provides context for our review of prices for Essential Water's water and sewerage services. The sections below:

- outline Essential Water's role and its water and sewerage services
- explain its current and proposed water supply and sewerage operations
- outline other recent IPART reviews that will influence this review, and
- compare Essential Water's actual expenditure and revenue over the 2014 determination period to the expenditure and revenue we allowed for when making the determination.

2.1 Essential Water's role and services

Essential Water is an operating division of Essential Energy,¹⁴ which is a NSW Governmentowned corporation primarily responsible for building, operating and maintaining the electricity distribution network in regional and remote NSW.

Essential Water provides water, sewerage, trade waste and miscellaneous services to around 18,000 people in Broken Hill, Menindee, Sunset Strip and Silverton.¹⁵

Essential Water's water supply functions are set out in the *Water Management Act 2000*. The sections below provide an overview of Essential Energy's water-related services, while Appendix B provides an overview of Essential Water's regulatory framework.

2.1.1 Water supply services

Essential Water supplies drinking water to nearly 11,000 customers, including about 10,000 residential and 600 non-residential customers. It also provides non-potable water to rural users along the Menindee to Broken Hill pipeline for stock and domestic purposes, and to mining customers.

Essential Water's largest customer is the mining company Perilya Ltd (Perilya), which in recent years has consumed approximately 30% of the total water supplied by Essential Water.¹⁶ A second mining customer, CBH Resources Ltd (Broken Hill Operations), also operates close to Broken Hill.

Essential Water provides the following water services:

- Treated water also known as drinking water or potable water to Broken Hill and Menindee.
- Untreated water also known as raw water to some locations in Broken Hill and Menindee, and to customers along the Menindee and Umberumberka pipelines.

¹⁴ Essential Water website, http://www.essentialwater.com.au/#, accessed 3 August 2018

¹⁵ Essential Water pricing proposal to IPART, July 2018, *Customer Summary*, p 4.

¹⁶ Essential Water Annual Information Return, July 2018.

- Chlorinated water which is raw water that has been disinfected but not filtered to customers in Silverton and Sunset Strip.
- Effluent water wastewater or sewerage that has been treated before being re-used or discharged to the environment, and also known as recycled water – to eight customers for a range of non-potable uses, including processing operations, dust suppression and maintaining local amenity.

2.1.2 Sewerage services

Essential Water provides sewerage services to approximately 9,500 properties in the city of Broken Hill, including some houses and other buildings in the Perilya mining lease area. It operates two sewage treatment plants, and after treating, sells around half the treated water as effluent water. The remaining half is discharged to the environment through evaporation ponds.

2.1.3 Trade waste and miscellaneous services

In this review, trade waste is defined as wastewater from commercial and industrial customers in which the concentrations of pollutants exceed the level contained in household wastewater. Essential Water provides trade waste services to non-residential customers in the city of Broken Hill only.

Essential Water also provides a range of miscellaneous services to its water and sewerage customers. These are generally one-off services such as connections and disconnections, replacing damaged services, plumbing inspections, site inspections and building plan approvals. Charges for these miscellaneous services are levied on a relatively small number of customers, and are charged on an as needed basis.

2.2 Essential Water's operations

Essential Water's service area is the most arid in the state, and experiences extreme climatic variations and more frequent drought than coastal areas.

2.2.1 Current water operations

Essential Water is an end water user and is currently licensed to extract 10 GL of water per year from the Menindee Lakes Scheme.¹⁷ Essential Water sources most of its bulk water from the Darling River via a pipeline to the Menindee Lakes. To supply water to Broken Hill customers, water currently sourced from Menindee Lakes is pumped a height of 287 metres over a distance of 116km from its source at the Darling River to the Mica Street water treatment plant in Broken Hill.

¹⁷ It also holds a licence to extract 29 ML per year of raw water for Menindee.

In addition to the Menindee pipeline, Essential Water currently also manages three other water sources:

- Stephens Creek Reservoir, which has a capacity of 19,000 ML, and can receive water from its own catchment. It is also currently used to store water supplied via Menindee Lakes.
- Umberumberka Dam, which has a capacity of 7,800 ML and receives water from its own catchment.
- Imperial Lake, a small dam with a capacity of 670 ML, which collects from its own catchment, including part of the Broken Hill urban area. It is used as emergency storage only.

Essential Water also manages a reverse osmosis (RO) desalination plant adjacent to the Mica Street water treatment plant, which is used during drought conditions when raw water from the lakes is too saline (see section 2.2.2).

Figure 2.1 shows the current water supply network.



Figure 2.1 Essential Water's current water supply network

Note: Map not to scale, for illustrative purposes only **Source:** IPART analysis, based on Essential Water pricing proposal to IPART, July 2018, p. 39.

2.2.2 The 2015-16 drought

From late 2014 until mid-2016, a prolonged drought contributed to low water levels in the Menindee Lakes. This led to concerns about water security and the imposition of progressively more severe water restrictions in the city during 2015.¹⁸ The low inflows into the lakes also increased the salinity of Broken Hill's bulk water supplies, requiring Essential Water to desalinate its raw water prior to treatment.

On 19 June 2015, the Minister for Industry, Resources and Energy directed Essential Water to construct, operate and maintain the necessary infrastructure to be able to supply 13 ML of drinking water per day to Broken Hill. The NSW Government also provided \$13.8 million directly to Essential Water for emergency drought works from the Restart NSW fund.

This project, which incorporated the construction of a new reverse osmosis plant, associated pipeline and brine ponds, was operated from December 2015. Full operation of the reverse osmosis plant ceased in September 2016. Since then, three units were decommissioned and removed, and four remaining units have been run in a care and maintenance mode.

2.2.3 The Broken Hill pipeline

The Menindee pipeline construction was completed in 1952. Essential Water indicated in its pricing proposal that the pipeline is nearing the end of its design life and fails regularly, requiring the entire pipeline to be taken out of operation until repair works are completed. When this happens, water supply to customers along the pipeline is interrupted until operation is restored.

On 16 June 2016, the NSW Government announced that it would build a 270km pipeline from the Murray River to Broken Hill.¹⁹ The Minister for Regional Water directed WaterNSW, under section 20P of the *State-Owned Corporations Act*, to build the pipeline from the Murray River to the Mica Street Water Treatment Plant in Broken Hill. When completed, the pipeline will largely eliminate Essential Water's need to access water from the Menindee Lakes. WaterNSW has contracted a consortium led by John Holland to construct, maintain and operate the pipeline. The pipeline is designed to provide up to 37.4 ML/day of raw water. This is around 130% of Broken Hill's current peak water demand, and 270% of its current average day's demand.²⁰

WaterNSW is also building a bulk water storage facility, with capacity of 720ML. This capacity is equal to around 25 days of water at Broken Hill's current peak day's demand.

In addition to the Broken Hill pipeline, associated pump stations and bulk storage, WaterNSW is also building a number of related capital assets that Essential Water has stated will be gifted

¹⁸ NSW Legislative Council General Purpose Standing Committee No.5, *Water Augmentation*, transcript of hearing 26 October 2016 (testimony of John Coffey, Essential Water) pp 38, 43.

¹⁹ NSW Government, New Pipeline to secure Broken Hill water supply, press release, 16 June 2016. Available at: https://www.nsw.gov.au/your-government/the-premier/media-releases-from-the-premier/new-pipeline-tosecure-broken-hill-water-supply/

²⁰ Essential Water annual information return, July 2018. Broken Hill's current peak day's demand for treated and untreated water is around 29 ML/day (highest within the period 2014-18) and average demand is around 14 ML/day (2014-18 period).

to Essential Water at no cost. Essential Water understands the Government will fund these assets directly.²¹ These additional assets include:

- the final section of pipeline and a pump station to transport water around 40km from WaterNSW's bulk storage to Broken Hill's main water treatment plant at Mica Street, as well as auxiliary works to integrate the pipeline into the treatment system, and
- electricity infrastructure needed to power the pipeline.

2.2.4 Proposed water operations

The completion of the Murray River to Broken Hill pipeline **will substantially change Essential Water's water operations for the 2019 determination period**. Essential Water's pricing proposal includes a number of changes to its existing water supply network, which are summarised in Figure 2.2.

²¹ Essential water pricing proposal to IPART, July 2018, p 57.



Figure 2.2 Essential Water's proposed water operations (including consequential works)

Note: Map not to scale, for illustrative purposes only.

Source: IPART analysis, based on Essential Water pricing proposal to IPART, July 2018, pp. 19, 27, 39, 57, 124, 125, 129, 130.

Once the new pipeline is operational, Essential Water plans to decommission the existing Menindee Lakes pipeline. This will have significant flow on impacts for its water operations:

- Customers in Broken Hill and Silverton, as well as mining customers Perilya and CBH, will begin receiving treated and untreated water sourced from the new pipeline.
- Customers in Menindee and Sunset Strip will continue receiving water from the Darling River. Essential Water has proposed providing customers in Sunset Strip with treated water from a new water treatment plant in Menindee through a new small diameter rising main, and closing the Sunset Strip water filtration plant.
- Customers who currently purchase untreated water from the Menindee pipeline (11 graziers) will begin receiving water from the Stephen's Creek reservoir. To enable this, Essential Water has proposed to construct a new pipeline from the reservoir. In effect, these 11 graziers would receive water from the new Broken Hill pipeline, as Stephen's Creek reservoir will be filled through this pipeline.

Essential Water has also proposed upgrades to its existing water supply network during the 2019 determination period. These include:

- upgrading the Stephen's Creek reservoir dam wall to comply with outstanding dam safety requirements
- recommissioning water filters at the Mica Street Water treatment plant to address the risk of blue-green algae contamination from the new WaterNSW bulk storage
- decommissioning the RO desalination plant, as the risk that water from the Murray River will be excessively saline is lower, and
- decommissioning Imperial Lake as an emergency water source, because of ongoing dam safety concerns.

In order to access water from the Murray River, Essential Water will update the 10 GL/year high security licence it currently holds for the Menindee Lakes Scheme, with two licenses:

- 8.1GL per year from the Murray River water source, to supply the new pipeline, and
- 0.4GL per year from the Lower Darling River water source, to supply its customers in Menindee and Sunset Strip.²²

2.2.5 Sewerage operations

Essential Water has two wastewater treatment plants – Wills Street and South Broken Hill. Sewage is piped through a network of 228 km of reticulation mains and 11 pumping stations to the wastewater treatment plants. Essential Water has proposed to replace the main sewerage treatment plant at Wills Street during the 2019 determination period.

2.3 Other relevant pricing reviews

We are currently undertaking, or have recently completed, other reviews that will influence our approach in this review. These include our:

²² Essential water pricing proposal to IPART, July 2018, p 62.

² IPART Review of Essential Energy's prices for water and sewerage services in Broken Hill

- Concurrent review of WaterNSW's pipeline prices: As Chapter 1 noted, we are currently reviewing the maximum prices WaterNSW will be allowed to charge pipeline customers (primarily Essential Water) for transporting water through the Murray River to Broken Hill pipeline. We will determine these prices based on WaterNSW's efficient costs for building, operating and maintaining the pipeline.
- 2017 review of WaterNSW's rural bulk water prices: In this review, we determined the maximum prices WaterNSW can charge customers for its bulk water storage and (river) delivery services. Essential Water purchases bulk water sourced from rivers managed by WaterNSW, so these prices influence the bulk water cost it incurs to supply water to its customers.
- 2018 review of IPART's WACC methodology: In February 2018 we updated our standard method for deciding the weighted average cost of capital (WACC).²³ We use the WACC as a key input for calculating the Notional Revenue Requirement and setting prices. We propose to use the updated method in this review.
- Concurrent review of IPART's financeability test: We are currently reviewing the financeability test we use to assess how our price determinations are likely to affect a regulated business's financial sustainability. We plan to finalise this review by November 2018.²⁴ We propose to use the revised financeability test in this review.
- Concurrent review of recycled water pricing: We are also reviewing our approach to regulating the recycled water prices of water utilities. Our review of pricing arrangements for recycled water services will cover all metropolitan water utilities we regulate, including Essential Water. Our preliminary view on recycled water prices in this review is discussed in section 10.9.

2.4 Essential Water's performance over the 2014 determination period

We set maximum prices for Essential Water in 2014 to recover the efficient costs of supplying water, sewerage and related services over the determination period (1 July 2014 to 30 June 2018). We have examined Essential Water's actual expenditure and revenue over this period, compared them to the expenditure and revenue we allowed for in setting prices, and examined the drivers of any major differences. The revenue and expenditure figures in this Issues Paper are based on information submitted to IPART by Essential Water in July 2018, and include expected revenue and expenditure for 2017-18.

2.4.1 Operating Expenditure

Essential Water's operating expenditure over the 2014 determination was \$66.9 million. This was \$8.0 million (13.5%) greater than we allowed for when setting prices in the 2014 determination (Figure 2.3). Essential Water attributed this increase to unanticipated costs related to the drought. These included extra pumping costs due to increased utilisation of the Menindee Lakes Pipeline and higher electricity prices; higher water treatment costs including

 ²³ IPART, *Review of our WACC Method*, Final Report, February 2018. Available at: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/investigation-administrative-legislative-requirements-sea-wacc-methodology-2017/final-report-review-of-our-wacc-method-february-2018.pdf

²⁴ IPART, Review of financeability test 2018. Available at: https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Reviews/Financeability-Tests/Review-offinanceability-test-2018

the costs of running the reverse osmosis desalination plant; and leasing land to dispose of brine produced by the plant.



Figure 2.3 Essential Water – actual vs allowed operating expenditure (\$million, \$2018-19)

Source: Essential Water annual information return, July 2018.

2.4.2 Capital expenditure

Essential Water's capital expenditure for the 2014 determination period was \$36.4 million. This was \$6.2 million (15%) less than our allowance (Figure 2.4). However, this does not include \$13.8 million in emergency drought works that were funded by the NSW Government. Essential Water states the large underspend was due to prioritising implementation of drought mitigation projects, which caused delays in its approved capital works program.



Figure 2.4 Essential Water – actual vs allowed capital expenditure (\$million, \$2018-19)

Source: Essential Water annual information return, July 2018.

2.4.3 Revenue and water sales

Because of the drought during 2015 and 2016, Broken Hill Council implemented water restrictions across Essential Water's service area. This caused demand to fall, which impacted Essential Water's water sales and revenue. Actual water sales (including treated, chlorinated and untreated water sales) were 13% less than allowed over the 2014 determination period (Figure 2.5).





Source: Essential Water annual information return, July 2018.

As a result of lower than anticipated water sales, Essential Water's actual revenue was \$85.9 million over the 2014 determination period. This was \$6.9 million (7.5%) lower than our allowed target revenue over the 2014 determination period (Figure 2.6).





Source: Essential Water annual information return, July 2018.

3 Our approach for establishing efficient costs and setting affordable prices

Our main objectives for this review are to establish the efficient costs that Essential Water will incur in supplying its services, and to set prices that recover a reasonable and affordable share of these costs from customers. To meet these objectives, we propose to use a three-step framework. The sections below explain our three-step framework, and then discuss our preliminary analysis on each of these considerations.

3.1 Our 3-step framework for establishing efficient costs and setting affordable prices

We propose to establish efficient costs and set affordable prices by taking the following three steps:

- 1. Establish the **total efficient cost** required to deliver Essential Water's services over the 2019 determination period. This would ensure that Essential Water and WaterNSW only recover the efficient costs of providing these services.
- 2. Apply our **cost sharing framework** to decide what share of the efficient cost of the Broken Hill pipeline should be notionally allocated to Essential Water's customers. This would identify the share of costs where it is more efficient for the Government or other 'impactors' to fund these costs.
- 3. Consider **what is affordable for customers**, before setting prices to recover the customers' actual share of Essential Water's efficient costs. This would assess the share of efficient costs that should be met by the Government as a safety net measure to ensure that water and sewerage prices remain affordable.

Sections 3.2 to 3.4 discuss each of these steps in turn.

Figure 3.1 provides an overview of this approach, and how it applies in this review, the concurrent WaterNSW pipeline review, and the 2017 WaterNSW bulk water review.



Figure 3.1 Framework for establishing efficient costs and setting affordable prices

IPART seeks comments on the following

1 Do you agree with our proposed framework for establishing total efficient costs and setting affordable prices? If not, what framework should we apply?

3.2 Establish total efficient costs

As the first step in our framework, we propose to establish the total efficient cost to deliver Essential Water's water and sewerage services over the 2019 determination period. As shown in Figure 3.2, we propose to establish the following three components of the total cost separately:

- 1. Bulk water purchasing costs, which we set in our 2017 review of WaterNSW's rural bulk water services.²⁵
- 2. Bulk water transportation costs incurred by WaterNSW in constructing, maintaining and operating the Broken Hill pipeline. We will establish the efficient levels of these costs in the WaterNSW pipeline review, which is running concurrently to this review.²⁶
- 3. Essential Water's operating and capital expenditure incurred to provide water and sewerage services to its customers, in addition to components 1 and 2 above (Essential Water's direct costs). These direct costs are summarised in Box 3.1. We will assess the efficient level of these costs in this review.

²⁵ IPART, Review of prices for WaterNSW rural bulk water services from 1 July 2017 to 30 June 2021, Final Report, June 2017.

²⁶ IPART, Review of prices for WaterNSW's Murray River to Broken Hill Pipeline services from 1 July 2019. Available at: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WaterNSW%e2%80%99s-Murray-River-to-Broken-Hill-Pipeline-services-from-1-July-2019

Box 3.1 How Essential Water divided its direct costs of supplying water and sewerage services to its customers

In its pricing proposal, Essential Water divided its direct costs into two components:

- 1. Proposed operating expenditure of \$57 million and capital expenditure of \$66 million on its existing water and sewerage network over the four years beginning 1 July 2019. It included these costs in its proposed prices.
- Proposed capital expenditure of \$59 million on consequential works that it considers are required as a result of the Broken Hill pipeline. It did not include these costs in its proposed prices.

Essential Water excluded the costs of the consequential works in its pricing proposal because it assumed that the Government will provide direct financial support to cover these costs.²⁷ However, if the Government does not, Essential Water has proposed that some or all of these costs be passed through to customers in prices.²⁸

We consider it appropriate to include the cost of consequential works in our assessment of total efficient costs, because Government funding has not been confirmed.

In Chapters 6 and 7, we discuss Essential Water's proposed capital and operating expenditure in more detail.

Source: Essential Water pricing proposal to IPART, July 2018.

²⁷ Essential Water pricing proposal to IPART, July 2018, pp 59 and 148.

²⁸ Essential Water pricing proposal to IPART, July 2018, p 59.



Figure 3.2 Establishing total efficient costs for Broken Hill customers

Establishing the total efficient cost is important for price setting. It provides transparency over a business's costs, and ensures no inefficient costs are recovered through prices. This

ensures that customers and/or taxpayers do not pay more than is required to deliver the services. Establishing the efficient level of the three main cost components separately is also important, because it makes these costs transparent, and allows stakeholders to engage directly on issues relevant to each component.

Essential Water's pricing proposal did not include its total costs. As Chapter 1 noted, it excluded the cost of transporting bulk water through the Broken Hill pipeline (component 2 above), and the cost of consequential works (part of component 3). Essential Water is seeking separate funding for these costs from the NSW Government. If this funding is not provided, Essential Water has proposed to pass through some or all of these costs to customers.

Our view is that it is critical to establish the efficient level of costs first, before turning to how these costs should be funded and by whom. If the Government provides a funding contribution for any of these cost components (or we receive confirmation that it will make a contribution) during our review, we will deduct the value of this contribution from our assessment of efficient costs.²⁹

3.2.1 Appropriate service standards for Essential Water's services

In establishing the total efficient costs, we would need to consider the standards of service Essential Water intends to meet. It is important that service standards are reasonable and in line with regulatory requirements, community expectations and willingness to pay.³⁰ This will help to avoid the risk of excessive spending on capital or operating expenditure. Essential Water has outlined its standards and its performance against them over the 2014 determination period in Table 3-2 of its pricing proposal.³¹

Service standards can include targets for water availability and quality, as well as water and sewerage system reliability. Many service standards are based on regulatory requirements such as the Australian Drinking Water Guidelines or environmental discharge licences issued by the NSW Environmental Protection Authority (EPA). However, other service standards have been developed by Essential Water itself (ie, they are self-imposed), based on customer preferences and the costs of meeting these standards.

It appears that Essential Water has developed its levels of service with reference to the NSW *Best-Practice Management of Water Supply and Sewerage Guidelines*³² and the *NSW Water and Sewerage Strategic Business Planning Guidelines*.³³ For example, Essential Water's availability standard is 3,000L per property per day for residential customers.³⁴ This volume exceeds

²⁹ For example, Essential Water has stated that it expects electricity infrastructure needed to power the pipeline to be funded by the Government and then gifted to Essential Water. If this is confirmed, these costs would be deducted from component 3.

³⁰ In economics, willingness to pay is defined as the maximum amount a person or business would be willing to pay in order to consume a good or service.

³¹ Essential Water pricing proposal to IPART, July 2018, pp 80-85.

³² NSW Government, Best-Practice Management of Water Supply and Sewerage Guidelines, August 2007. Available at http://www.water.nsw.gov.au/__data/assets/pdf_file/0008/554489/town_planning_water_utilities_best-

http://www.water.nsw.gov.au/__data/assets/pdf_file/0008/554489/town_planning_water_utilities_bestpractice_management_of_water_supply_and_sewerage_guidelines_2007.pdf

³³ NSW Government, NSW Water and Sewerage Strategic Business Planning Guidelines, July 2011, p 32. Available at: http://www.water.nsw.gov.au/__data/assets/pdf_file/0004/549652/utilities_nsw_water_sewerage_strategic_p lanning_guidelines.pdf

³⁴ Essential Water pricing proposal to IPART, July 2018, p 80.
Broken Hill's current peak day usage,³⁵ and the ability to deliver this amount of water could drive up Essential Water's costs.

In addition, Essential Water also has a reliability standard to guarantee water pressure to customers at all times. Specifically, it has a target that supply interruptions to the Broken Hill water treatment plant are less than 12 hours in duration. An interruption of less than 12 hours ensures that service reservoirs retain sufficient water levels to maintain water pressure to all customers, particularly those located in high areas of the distribution network.

We understand that these reliability standards have been developed by Essential Water. While higher standards generally mean higher costs, there are reasons why Essential Water's customers may value this added water reliability. For example, customers may value water for use in evaporative air-conditioners or to manage lead dust.

The Broken Hill pipeline should improve on current performance, and current performance is rated reasonably highly by customers. Essential Water's customer engagement survey results indicate that reliability is not a key concern, with 67% of customers reporting that Essential Water is performing very well on providing a reliable water supply. This would appear to suggest that customer willingness to pay to improve reliability is low. On areas for improvement, 32% of customers cited quality of water, 19% cited affordability, while only 5% cited reliability.³⁶

It is important that the trade-off between service standards (such as reliability) and cost is considered in the determination of standards. Higher service levels generally mean higher costs of supply, and vice-versa.

IPART seeks comments on the following

2 Are Essential Water's current and proposed service standards appropriate?

3.3 Apply our cost sharing framework

The second step in our framework is to apply our cost sharing framework to establish the share of each cost component that should be notionally allocated to Essential Water's customers (as opposed to other parties). We used this cost sharing framework in our 2017 review of WaterNSW rural bulk water services, and are currently conducting a separate review of this framework as it applies to WaterNSW's and WAMC's rural water services.³⁷

In our concurrent review of WaterNSW's prices for the Broken Hill Pipeline, we will set WaterNSW's prices so that it recovers the efficient costs of complying with the Minister's

³⁵ Essential Water annual information return, July 2018. Broken Hill's peak day's demand for treated water is around 27 ML/day (the highest consumption within the period 2014-18).

³⁶ Essential Water pricing proposal to IPART, July 2018, chapter 4.

³⁷ IPART, Review of Rural Water Cost Shares. Available at: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Rural-Water-Cost-Shares

directions to construct and operate the pipeline.³⁸ This is in accordance with the section 16A direction issued to us by the Minister.³⁹

In the review of WaterNSW's prices for the Broken Hill Pipeline, we will also apply our cost sharing framework to determine how the Broken Hill pipeline's costs should be notionally shared between Essential Water's customers and the NSW Government (on behalf of the broader NSW community). This will determine the notional customer share of Essential Water's total efficient costs (ie, the customer share of its notional revenue requirement).

We would then consider what prices customers can afford, to determine the share of Essential Water's notional revenue requirement that should actually be paid by customers.

We outline our cost sharing framework below.

3.3.1 Our cost sharing hierarchy

In most cases, the water services provided by a utility to its customers are largely private goods that benefit those who consume the service.⁴⁰ Customers are the 'impactors' because they create the need for the service. Therefore, they should pay for these costs directly.

However, there is sometimes a case to share efficient costs between customers and other segments of the community, when costs are incurred because of the actions of, or to deliver services to, other segments of the community.⁴¹ For example, if the assets used to provide regulated water services are designed to deliver other outcomes (such as flood management or recreation services) in addition to the core water services, it may be appropriate for the government to contribute to the costs on behalf of the broader community.

Under our cost sharing framework, we consider that using the impactor pays principle is most consistent with cost-reflective pricing, because it is more efficient for costs to be allocated to those who create the need to incur these costs.⁴² If we are not able to identify a clear set of impactors who have created the need for these costs, we would adopt a beneficiary pays approach. Under the beneficiary pays approach, the costs of a service or activity would be allocated to those who benefit from the service or activity.

³⁸ NSW Government, Direction to the Board of WaterNSW in relation to the construction of the Broken Hill pipeline 2017, 31 August 2017. Available at: https://www.parliament.nsw.gov.au/la/papers/DBAssets/tabledpaper/webAttachments/

 ^{71880/}section%2020P%20direction%202017.pdf, accessed on 24 August 2018.
 NSW Government, *Direction to IPART in relation to the construction and operation of the Broken Hill pipeline 2018*, 19 April 2018. Available at: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-rural-water-prices-for-waternsw-murray-river-to-broken-hill-pipeline-services-from-1-july-2019/legislative-requirements-prices-for-waternsw-murray-river-to-broken-hill-pipeline-services-from-1-july-2019/section-16a-letter-and-direction-the-construction-and-operation-of-the-broken-hill-pipeline-pipeline-2018-19-april-2018.pdf, accessed on 24 August 2018.

⁴⁰ In economics, private goods are goods or services that are excludable (those who have not paid for it cannot use it) and rivalrous (use by one party necessarily prevents use by another party).

⁴¹ We have adopted this approach in sharing costs between rural water customers and the NSW Government (on behalf of the broader community) when determining prices for WaterNSW's rural bulk water services and the Water Administration Ministerial Corporation's (WAMC's) monopoly water services.

⁴² Allocating costs in this way can promote economically efficient outcomes over time, because the impactor would only choose to consume the service if the benefit they receive exceeds the costs that arise from providing the service.

Our preference for the impactor pays principle is consistent with our approach across a range of services, where we have generally adopted the following hierarchy:

- 1. Preferably, the party that created the need to incur the cost (the impactor) should pay in the first instance.
- 2. If that is not possible, the party that benefits (the beneficiary) should pay. Further, it is preferable for direct beneficiaries to pay, but if that is not possible then indirect beneficiaries should pay.
- 3. In cases where it is not feasible to charge either impactors or beneficiaries (for example, because of social welfare policy, public goods, externalities, or an administrative or legislative impracticality of charging), the government (taxpayers) should pay.⁴³

We intend to analyse the appropriate cost shares for pipeline services in the WaterNSW pipeline review, and if a Government cost share is appropriate, to apply the Government share for the pipeline in this review.

3.3.2 Application to the Broken Hill Pipeline

We propose applying our cost sharing framework to determine what share of the efficient costs of the Broken Hill pipeline should be notionally allocated to Essential Water's customers. It is important that customers do not pay more than their efficient share of the costs to provide a service.

In applying our cost sharing framework to the pipeline, we will take a number of matters into account. This will include identifying who is causing the need for the pipeline (ie, the 'impactors'), who will likely benefit from the pipeline (ie, the 'beneficiaries'), and whether it is practical to recover costs from these impactors and beneficiaries.

We will consider the key reasons driving the need to build the pipeline, including the need to provide water security to Broken Hill and surrounding communities. From an 'impactor pays' perspective, this would suggest Broken Hill and surrounding communities should contribute to the cost of the pipeline.

We also recognise the pipeline may facilitate a reduction in the evaporative loss of water from the Menindee Lakes system and those reduced losses could generate water supply for other parts of the Murray Darling Basin (ie, provide benefits beyond Broken Hill). From a 'beneficiary pays' perspective, this would suggest the NSW Government on behalf of the broader community should contribute to the cost of the pipeline.

We are seeking stakeholder feedback on how the efficient costs of the pipeline should be notionally allocated between Essential Water's customers and the NSW Government on behalf of the broader community.

Irrespective of our decision on the notional sharing of the pipeline's costs, in this review we will consider the key issue of what Essential Water's customers in and around Broken Hill can afford to pay.

⁴³ For example, we recommended the adoption of this funding hierarchy in our review of the funding framework for Local Land Services in NSW. For further information, see IPART, *Review of funding framework for Local Land Services NSW – Draft Report*, 2013.

3.4 Consider what customers can afford to pay

As the final step in our framework, we propose to consider what prices Essential Water's customers can afford to pay to determine the customers' actual share of efficient costs. This will involve assessing customers' capacity to pay using quantitative and qualitative analysis, and considering whether the change in prices is likely to lead to 'bill shock' for different types of customers.

Setting prices that are affordable will be a particularly important consideration in this review given the large proposed expenditures; declining population in Broken Hill and customers' relative economic disadvantage.

We propose to consider the following quantitative information:

- a comparison of Essential Water's bills under our pricing decisions to those of other utilities (benchmarking)
- the level of incomes, particularly household incomes, in Essential Water's areas of operation and how these compare to incomes in other areas
- the likely share of income spent on water and sewerage services, and
- other information, such as the share of customers who pay their bills on time, and the hardship policies that Essential Water has in place for customers who experience difficulty in paying their bills.

We also propose to consider qualitative information, particularly the feedback we receive from stakeholders throughout this review, including submissions made to this Issues Paper.

We propose to conduct a separate assessment of what prices are affordable for residential customers, non-residential customers and mining customers (CBH and Perilya). This is because we will need different information for each group, and the capacity to pay for water and sewerage services may differ across these groups.

The difference between revenue received from customer payments for water and sewerage services and the total efficient cost of delivering these services would likely be met through a Government contribution – unless we identify other billable parties when applying cost sharing principles.

Our preliminary analysis is outlined below.

3.4.1 Residential customers

In this section we present our preliminary quantitative analysis on how affordable Essential Water's current bills are for residential customers. We consider in turn:

- how Essential Water bills compare to other utilities
- household incomes in Broken Hill compared to other areas
- the average share of household income spent on water, and how this might vary across different types of households, and
- the proportion of customers that experience restrictions or disconnections, as an indicator of financial hardship.

How Essential Water bills compare to other utilities

Essential Water's current prices are lower than the average across NSW and regional water utilities (Figure 3.3).





Source: Bureau of Meteorology, Urban National Performance Report, 2016-17.

However, our preliminary analysis suggests that if prices increased according to Essential Water's proposal (excluding bulk water transportation costs and consequential works), its water and sewerage services would be somewhat less affordable. Figure 3.4 compares Essential Water's current and proposed bills to those of 35 other water utilities. Our analysis suggests that Essential Water's current bills are lower than 27 of these utilities, and our analysis suggests that if its pricing proposal was adopted, bills would be lower than 22 of these utilities by 2022-23.⁴⁴

⁴⁴ Essential Water pricing proposal to IPART, July 2018, p 15; Essential Water pricing proposal addendum to IPART, September 2018.

Figure 3.4 Essential Water bills and rankings compared against other utilities (\$2015-16, real)



Source: Essential Water pricing proposal to IPART, July 2018, p 43; Essential Water pricing proposal to IPART, Addendum, September 2018; 2015-16 NSW Water Supply and Sewerage Benchmarking Report, p 116.

Household incomes in Broken Hill compared to other areas

Figure 3.5 shows that median household incomes in Broken Hill are substantially lower than those in regional NSW and NSW as a whole.





Source: ABS, Census of Population and Housing, Australia, 2016.

Average share of household income spent on water and sewerage

As an indicative estimate of the average proportion of household income spent on water and sewerage services, we divided median weekly household incomes by the average water and sewerage bills shown in Figure 3.3, and the average water and sewerage bills in Essential Water's price proposal (in \$2015-16 terms to be consistent with \$2015-16 incomes). The results, shown in Figure 3.6, suggest that Essential Water's bills currently represent a similar share of household income as water and sewerage bills in other regional NSW areas (on average). However, if its pricing proposal were accepted, its bills would be about 0.4% higher, as a share of median income, than those in other regional areas.

Figure 3.6 Average bills as a share of gross median weekly household income



Source: Essential Water pricing proposal to IPART, Addendum, September 2018; ABS, Census of Population and Housing, Australia, 2016; Bureau of Meteorology, Urban National Performance Report, 2016-17.

However, comparing average residential bills to household incomes does not take account of important distributional impacts. For example, the average share of income spent on water does not tell us whether there are a significant proportion of low income households that might have high water consumption or bills.

To the extent possible, we would aim to consider what prices different types of households can afford. Figures 3.7 and 3.8 show the distribution of household incomes for different household types in Essential Water's operating area, from the 2011 and 2016 census results. They indicate that a sizeable proportion of households which might be expected to have high water consumption (families with children) have fairly low reported incomes. In this review, we intend to compare this distribution to other geographical areas as part of our analysis.



Figure 3.7 Broken Hill weekly household income by household type (\$2011)

Source: ABS, Census of Population and Housing, Australia, 2011.





Source: ABS, Census of Population and Housing, Australia, 2016.

The proportion of restrictions or disconnections

We have also compared the number of customer restrictions or disconnections for nonpayment of water bills for Essential Water and other utilities. Figure 3.9 shows that Essential Water has a higher number of restrictions or disconnections (per 1000 properties) than other regional NSW utilities and national small utilities. In addition, Essential Water has identified that 902 residential customers – about 10% of all residential customers – are currently on an active payment plan to manage their bills. This suggests that Essential Water has a significant proportion of customers experiencing financial stress. We will seek further information from Essential Water on how it works with customers experiencing financial hardship.



Figure 3.9 Number of restrictions or disconnections applied for non-payment of water bill (per 1000 properties)

Note: National Small Utilities are defined as those with 10,000-20,000 connections. **Source:** Bureau of Meteorology, Urban National Performance Report, 2016-17.

3.4.2 Non-residential customers

Essential Water has around 600 business customers. To establish what prices business customers can afford, we propose to rely more heavily on benchmarking with other water utilities and other information, including the share of customers that pay their bills on time.

Essential Water reported that 34 non-residential customers – or about 5% of all non-residential customers – are currently on a payment plan to manage their bills.

3.4.3 Mining customers

The 2014 determination was the first time we set separate prices for Essential Water's water services to the mines in Broken Hill. Our decision was to maintain the mines' contribution to Essential Water's water revenue at their existing share (ie, as at 2013-14), which reflected the mines' share of total water consumption. Once we determined the mines' share of water revenue, we then set prices for the mines to recover this revenue requirement.

In the 2019 price review, we will need to determine what share of water revenue (or costs) the mines should pay. Essential Water proposes that mines continue to pay in line with their share of total water consumption.

In setting Essential Water's prices to the mines, we will consider:

- the appropriate proportion of Essential Water's costs to attribute to the mines (eg, whether this should be based on their share of total water consumption or some other indicator of their contribution to Essential Water's costs), and
- the mines' capacity to pay.

3.4.4 Preliminary views

Our preliminary views based on our initial analysis are:

- The capacity to pay for water and sewerage services differs across residential, non-residential and mining customers. Affordability is likely to be a particularly significant concern for specific residential household types, eg, families with children.
- The appropriate ceiling for price increases should differ across these three groups.
- Bills for these three groups are currently affordable, but the full efficient costs of delivering water services to Broken Hill (including consequential works and bulk water transportation costs via the Broken Hill pipeline) might be unaffordable for all customer groups.

IPART preliminary view

1 Setting prices that customers can afford is likely to be a key concern in this review, and we should conduct a quantitative and qualitative assessment to ensure the prices we set are affordable for customers.

IPART seeks comments on the following

- 3 Should we assess the price residential, non-residential and mining customers can afford separately? What quantitative or qualitative analysis should we consider when assessing what each group can afford?
- 4 What is a reasonable ceiling for annual bill increases, for residential, non-residential and mining customer groups, to protect customers from bill shock?

4 Decisions we will make before setting prices

This chapter discusses a range of decisions we will make before setting prices. It discusses, in turn, Essential Water's proposal and our preliminary views on:

- the length of the determination period
- the building block approach we use to establish the revenue Essential Water requires to deliver its services efficiently
- the form of regulation, or method, we use to set prices
- mechanisms to promote future efficiency savings
- potential adjustments to address sources of revenue and cost risks for the utility, and
- the treatment of exempt properties.

In Chapters 5 to 8 we discuss the elements of our building block approach we use to establish the revenue Essential Water requires to deliver its services efficiently.

4.1 Length of determination period

An early step in a price review is to decide how long to set prices for (length of determination period). In general, IPART sets determination periods of between one and five years.

In recent years we have favoured 4-year determinations as we considered that a 4-year price path struck an appropriate balance between providing certainty to the regulated business and limiting delays in customers benefitting from efficiency gains.

We consider a number of factors when deciding on the length of the determination period (Box 4.1).

Box 4.1 Factors we consider in deciding length of determination

In general, the factors we consider when deciding the length of a determination period are:

- the confidence we have in the utility's forecasts
- the risk of structural changes in the industry
- the need for price flexibility and incentives to increase efficiency
- the need for regulatory certainty and financial stability
- the timing of other relevant reviews, and
- stakeholder views.

Longer determination periods have several advantages over shorter periods. For example, a longer period: provides greater stability and predictability (which may lower a utility's business risk and assist investment decision making); creates strong incentives for a utility to increase efficiency; and reduces regulatory costs.

However, longer determination periods also have disadvantages. These include: increased risk associated with using inaccurate data to set prices; possible delays in customers benefitting from any efficiency gains; and the risk that changes in the industry will impact the effectiveness of the determination.

Essential Water has proposed a 4-year determination period. Overall, our preliminary view is that a 4-year determination period is appropriate. This is because:

- Essential Energy's water business is relatively small, and a pricing review process imposes a proportionally large regulatory burden on the business. A 4-year determination period would also provide regulatory certainty and financial stability.
- On the other hand, there is significant uncertainty regarding future water demand, once the Broken Hill pipeline is operational, which affects the reliability of our demand forecasts.

We seek stakeholder views on an appropriate determination period before making our decision.

IPART seeks comments on the following

5 How long should we set prices for in the 2019 determination?

4.2 Our building block approach to determining the revenue requirement

We propose to use our standard 'building block' method to calculate Essential Water's notional revenue requirement (NRR) over the determination period. The NRR represents our view of the total efficient costs of providing Essential Water's services.

In general, we set prices to recover this amount of revenue. The building block costs of service provision include:

The revenue required for operating expenditure over the determination period, which represents our estimate of Essential Water's forecast efficient operating, maintenance and administration costs.

- An allowance for a return on assets used to provide the regulated services, which represents our assessment of the opportunity cost of the capital invested in Essential Water by its owner, and ensures Essential Water can continue to make efficient investments in capital.
- An allowance for a return of assets (regulatory depreciation), which recognises the revenue needed to recover the cost of maintaining the regulatory asset base (RAB), because a water utility's capital infrastructure will wear out over time.
- A **regulatory allowance for tax**, which is needed under a post-tax rate of return model.⁴⁵
- An allowance for working capital, which represents the holding cost of net current assets.

The sum of these allowances is the notional revenue requirement (see Figure 4.1).

Figure 4.1 Building block approach to calculating notional revenue requirement (NRR)



Note: The building block components of NRR in the figure above are not to scale and are for illustrative purposes only.

In determining the NRR, we will commission expert expenditure consultants to assist us in determining prudent and efficient capital and operating costs of delivering Essential Water's services. This will include an assessment of the efficiency gains Essential Water can reasonably achieve over the determination period.

⁴⁵ IPART, *The incorporation of company tax in pricing determinations – Final Decision*, December 2011.

Essential Water proposed that IPART apply our building block method to determine its revenue requirement. In Chapter 5 we summarise Essential Water's proposed Notional Revenue Requirement and seek stakeholder feedback.

4.3 Form of regulation

The 'form of regulation' we adopt is the set of methods we use to regulate prices for monopoly services. These methods include how costs are assessed, whether prices are directly or indirectly controlled, and how performance gains of the utility are incentivised.

The form of regulation can determine how much discretion the regulated entity has to adjust its prices within a regulatory period, how and how frequently the regulator reviews or adjusts prices, and how risks and rewards are shared between the regulated business and its customers.

There are several forms of price control which each provide different incentives to the regulated entity to deliver its services more efficiently, and/or different distributions of risk between the regulated entity and its customers. Some of the most common forms are summarised in Box 4.2.

Box 4.2 Different forms of price controls

The different forms of price control include the following:

- Price cap maximum prices are determined at the start of the determination period and adjusted each year for inflation. This approach provides predictable prices for customers, but the regulated entity bears volume-related risk to the extent that price structures do not perfectly match the utility's cost structures. (The utility will not face volume-related risk if its fixed price is set to recover its fixed costs, and its usage price is set to recover its variable or marginal costs).
- Revenue cap a regulated entity receives its total revenue allowance for a regulatory period, irrespective of the volume of regulated services provided. Customers bear any volume-related risk through price increases or decreases over the regulatory period.
- Weighted average price cap a maximum average price is set for each group of the utility's prices for the first year of the determination. A formula can also be determined for adjusting this average price in each subsequent year of the regulatory period. The regulator can also set limitations on the amount by which some or all individual prices within the groups can increase during the determination. Utilities then have the freedom to rebalance prices (increase or decrease individual prices), so long as the weighted average of the prices is less than or equal to the maximum average price, and they comply with any limitations imposed. The accuracy of volume forecasts will significantly affect the overall revenue that the utility is able to earn while keeping within the weighted average price cap.^a
- Hybrid of the revenue and price cap controls a price control is in place but additional measures to mitigate the risk of the utility under or over-recovering its revenue requirement are also used.

a IPART, Form of Economic Regulation for NSW Electricity Network Charges, Discussion Paper, August 2001, pp 5-6.

Currently, we control Essential Water's prices directly by setting maximum prices for each service for each year of the determination period (ie, a price cap).

4.3.1 Essential Water's proposed form of regulation

Essential Water proposed that a price cap should continue to be the form of price control in the 2019 determination period, whereby IPART sets maximum prices for its services. This is because it considers the current price cap method to be fit-for-purpose for Broken Hill. Essential Water argues that alternative forms of regulation would be too costly to develop and apply, given the small size of the business.

Essential Water suggested that revenue risks related to variations in forecast and actual volume of water sales could be managed through a demand volatility adjustment mechanism (discussed in section 4.5.2).

4.3.2 IPART's response

Our preliminary view is that the current form of regulation is appropriate, particularly as it provides certainty and stability for both customers and Essential Water.

However, other stakeholders may propose to change the form of regulation. We will consider these proposals based on whether potential benefits are likely to outweigh potential costs, or risks.

IPART seeks comments on the following

6 Do you support a price cap as an appropriate form of regulation for Essential Water?

4.4 Promoting future efficiency savings

We set maximum prices that reflect our best estimate of the efficient costs required to deliver regulated services over the determination period. Therefore, if the business makes further cost savings during the determination period, our current approach would allow the business to keep these profits from cost savings made during the determination period. If these cost savings are permanent, they are then passed onto customers through lower prices (reflecting lower costs) at the **next** price determination.

This is referred to as 'incentive regulation', because the business has a financial incentive to achieve cost savings during the determination period.

4.4.1 The efficiency carryover mechanism

However, a shortcoming of the current approach is that the financial reward for achieving savings reduces over the determination period, as we get closer to the next price determination (when costs are re-assessed and prices are set to reflect the latest estimate of efficient costs). This means Essential Water has an incentive to delay savings from the latter years of one determination period to the beginning of the next.

To address this shortcoming, an Efficiency Carryover Mechanism (ECM) would allow permanent efficiency gains (ie, cost decreases) to be held by the utility for a specified period (eg, four years) before they are passed on to customers, regardless of when they are achieved within a determination period. This equalises the incentive to make permanent efficiency savings over a determination period. As a result, this removes the incentive to defer identifying cost savings to the beginning of the following regulatory period.

Further information on our ECM is available in our 2016 Final Report on our review of Sydney Water's prices, where we first introduced the mechanism.⁴⁶ Our ECM is currently limited to operating expenditure.

4.4.2 Essential Water's proposal

In its pricing proposal, Essential Water acknowledged the efficiency benefits of an ECM. However, it proposed not to adopt an ECM as part of the 2019 determination, because the relatively small size of Essential Water's business would likely see the benefits of the ECM outweighed by the increased administration costs associated with the introduction and ongoing reporting of an ECM. Essential Water also raised concerns about the increased complexity of the mechanism.

4.4.3 IPART's response

Our preliminary view is that we would not implement an ECM for Essential Water in this review. We will next be reviewing Sydney Water's water and sewerage prices over 2019-20. In that review, we will consider the effectiveness of the ECM we implemented in our 2016 review. That outcome will inform our decisions on the ECM in future price reviews, including those for Essential Water.

With that said, we consider that an ECM would remove any incentive to delay permanent cost savings. Furthermore, given that utilities can choose to opt-in to using the ECM, administrative costs could be low.

We note Essential Water's view that the relatively small scale of its operations would likely result in the benefits being outweighed by the administrative costs of the ECM.

IPART seeks comments on the following

7 Should we apply an efficiency carryover mechanism (ECM) to Essential Water's operating expenditure?

4.5 Considering revenue and cost risks

As outlined in Section 4.2, by setting maximum prices for Essential Water's services, we would provide stable prices for customers. However, Essential Water would bear risk to the extent that its price structures do not perfectly match its cost structures and there is a difference between actual sales volumes and forecast sales volumes. To address this risk, Essential Water has proposed a demand volatility adjustment mechanism.

To address the risk that its actual costs may vary from its forecast costs due to uncertain events, Essential Water has proposed cost pass-throughs for four events.

⁴⁶ IPART, Review of prices for Sydney Water Corporation – Final Report, June 2016, p 53.

⁶ IPART Review of Essential Energy's prices for water and sewerage services in Broken Hill

We discuss these proposals, and our preliminary views on these proposals, below.

4.5.1 Cost pass-through events

Essential Water has proposed cost pass-through events to deal with four events that it considers are "unexpected" or "uncontrollable". Under Essential Water's proposal, the impact on Essential Water's costs of these events would be passed through to customers via prices. This would allocate risk from Essential Water to customers. These events are:

- 1. **Regulatory change event –** to address revenue gained or lost through a change in the regulatory, legal or tax environment.
- 2. Drought relief event to recover costs for government directed drought relief measures.
- 3. **Murray River to Broken Hill pipeline event** if costs incurred are materially higher than those allowed by IPART, and
- 4. **Consequential works event –** if separate Government funding is not secured.

The specific proposed triggers for each of these four events are presented in Appendix C.

Essential Water has also proposed a materiality threshold of 2.5% of the Notional Revenue Requirement (NRR). In other words, a cost pass-through would apply if one of the triggers resulted in its revenue or costs changing by more than \pm 2.5% of the NRR – or about \$500,000 per year. In this event, Essential Water proposes that some or all of these costs would be recovered from customers through prices.

We will assess these proposals against our criteria

We will assess these proposals against our cost pass through criteria, which is outlined in Box 4.3 below.

Box 4.3 Criteria for cost pass-through mechanisms

Cost pass-through mechanisms should only be applied in situations where:

- There is a trigger event (to activate the cost pass-through), which can be clearly defined and identified in the price determination.
- The resulting efficient cost associated with the trigger event can be fully assessed including whether there are other factors associated with the trigger event that fully or partially offset the direct cost of the event. Under the IPART Act, the costs to be passed through must be specified in the price determination.
- The resulting cost is assessed to exceed a materiality threshold.
- The regulated business cannot influence the likelihood of the trigger event or the resulting cost.
- The mechanism is symmetric in that it applies equally to cost increases and cost decreases (in cases where the risk can result in both cost increases and cost decreases).
- It is clear the cost pass-through will result in prices that better reflect the efficient cost of service both before and after the trigger event occurs.

IPART's response

Our preliminary view is that these four events do not justify a cost pass-through mechanism. In particular:

- As discussed in Chapter 3, our proposed approach is that we would establish the total efficient cost of providing water in Broken Hill. If the actual costs incurred are materially higher than those allowed by IPART, after a prudency⁴⁷ and efficiency test of full costs, then customers should not bear the risk of cost increases. Furthermore, the pipeline and consequential works are not unexpected or uncontrollable events. Therefore, a cost pass-through mechanism is not required for a Murray River to Broken Hill pipeline event or a consequential works event.
- The new Broken Hill pipeline has been built to provide a reliable source of water, which is less affected by drought. Therefore, we do not view that a pass-through event is required for a drought event.
- We note that our framework for establishing Essential Water's efficient costs does not eliminate the risk of regulatory change events. However, as discussed in Box 4.3, the IPART Act limits our discretion to apply cost pass-throughs within a regulatory period to particular events that can be specified in advance, and the regulatory change pass-through proposed by Essential Water may not meet this threshold. Furthermore, if we were to implement a cost pass-through event to eliminate these risks, there would be no incentive for the utility to plan for and engage with potential regulatory changes. Therefore, we consider that if an event does have a material adverse impact on Essential Water's financial position, it is more appropriate to consider the case for an early review and determination.

IPART preliminary view

2 That Essential Water's four proposed cost pass-through events should not be applied.

IPART seeks comments on the following

8 Are Essential Water's proposed cost pass-through events reasonable?

4.5.2 Demand volatility adjustment

There is inherent risk in setting prices based on water sales forecasts. Actual water sales will depend on a number of factors that can vary unexpectedly, including weather patterns and population changes.

To address this risk, Essential Water has proposed a mechanism to automatically adjust its revenue in subsequent determination periods if actual water sales are 5% higher or lower than forecast (ie, a demand volatility adjustment with a \pm 5% materiality threshold). This proposed adjustment is similar to our decision in the 2016 determination for Sydney Water.

In the 2014 determination for Essential Water, we decided to consider a demand volatility adjustment to Essential Water's revenue requirement at the 2019 determination, rather than set an adjustment with a fixed threshold. However, in its pricing proposal, Essential Water

⁴⁷ The prudency test will not be applied to the pipeline.

B IPART Review of Essential Energy's prices for water and sewerage services in Broken Hill

has not proposed to trigger a demand volatility adjustment for the 2014 determination period, because:

- the prioritisation of NSW Government funded emergency drought infrastructure meant Essential Water offset some lost water revenue by delaying planed capital expenditure, and
- applying a demand adjustment would increase prices that might not be affordable for Essential Water's customers.

IPART's response

Our preliminary view is that it is preferable to retain the approach in our 2014 determination, ie, to retain flexibility in terms of whether prices are adjusted at the next price determination to account for sales volatility over the 2019 determination period.

First, due to Essential Water's unique operating environment, implementing a demand volatility adjustment with a fixed threshold may unnecessarily increase risks to customers. For example, Essential Water's two mining customers account for about 30% of its water demand. If one of the mines were to significantly decrease its water consumption (or shut down) over the 2019 determination period, we think it would be appropriate to consider whether:

- the revenue shortfall should be recovered from other customers, or
- there is an economic case for 'stranding' some of Essential Water's assets ie, a portion of asset capacity would not be used to provide services to the customer base, and the associated costs would not be recovered from the remaining customers.

Second, we are considering setting prices in a way that would reduce the need for a demand volatility adjustment.

- In Chapter 10, we discuss potentially setting water usage charges with reference to Short Run Marginal Costs (SRMC) of supply. If setting the water usage charge on this basis is appropriate, this would reduce the need for a demand volatility adjustment.
- Our proposed framework would consider the share of Essential Water's total efficient costs that should be funded by customers through tariffs, and the share that should be funded through a Government contribution. If we decide that a Government contribution is appropriate, then the way this contribution is structured could influence the cost and revenue risks that Essential Water faces. This is discussed further in Chapter 8.

We seek stakeholder views on whether we should define a materiality threshold (and what it should be), given uncertainties in Essential Water's likely water demand profile once the Broken Hill pipeline is operational.

IPART seeks comments on the following

9 Should we introduce a demand volatility adjustment for Essential Water in the 2019 determination? If so, is ±5% a reasonable threshold?

4.5.3 Treatment of exempt customers

Certain water users are exempt from water service charges under NSW legislation (eg, schools, churches and hospitals).

Our policy for State Owned Corporations (including Essential Water) is that we do not include the expected shortfall in revenue due to exempt properties in the NRR, for the purpose of setting prices. That is, we set prices assuming there are no exempt properties. This ensures that other water customers do not bear the costs of providing such as exemptions. Our view is that the funding of such exemptions (and other community service obligations) is a matter between the NSW Government and each State Owned Corporation.

Essential Water does not support this approach, because it does not consider it appropriate to fund exemptions through separate NSW Government funding. Essential Water has proposed funding these exemptions through existing pricing arrangements or by introducing cost-reflective tariffs for exempt customers.

Our preliminary view remains that Essential Water should seek Government funding for these exemptions, and that they should not be funded by other water customers. Furthermore, IPART does not determine which properties are exempt from water service charges under NSW legislation.

IPART seeks comments on the following

10 If separate Government funding is not provided for exempt customers, should the foregone revenue be paid by Essential Water's other water customers?

5 Notional Revenue Requirement

This chapter summarises the Notional Revenue Requirement (NRR) that Essential Water has proposed is recovered from customer tariffs. In particular, Essential Water's proposed revenue from its prices to customers would only recover a portion of the total costs of providing water and sewerage services to its customers in Broken Hill. As outlined in Chapter 3, our proposed approach is to set the total efficient cost Essential Water requires to recover its costs, before establishing the share of these costs that should be recovered from its customers.

Chapters 6 to 8 analyse the components of Essential Water's proposed NRR in more detail.

5.1 Essential Water's proposed revenue requirement

In 2018-19 dollars, Essential Water has proposed a NRR of \$100.1 million over a four-year determination period, or an average of \$25 million per year. In comparison, Essential Water's revenue from customers for 2018-19 is \$22.8 million (see Table 5.1).

\$000s	Current			Proposed		
<i>v</i> ····	-					
	2018-19	2019-20	2020-21	2021-22	2022-23	Cumulative 4-year total
Operating expenditure	16,585	14,645	13,795	14,013	14,800	57,254
Depreciation	2,438	3,033	3,342	3,667	3,906	13,948
Return on assets	3,878	6,296	6,513	7,026	7,279	27,115
Return on working capital	-135	22	2	16	48	87
Tax allowance	52	234	231	605	668	1,738
Notional revenue requirement	22,818	24,230	23,884	25,327	26,701	100,142
Target Revenue	22,818	23,061	24,351	25,713	27,149	100,274
Difference	0	-1,169	467	386	448	132

Table 5.1Essential Water's proposed notional revenue requirement (\$2018-19 – ie,
without inflation)

Source: Essential Water pricing proposal to IPART, July 2018, pp 179-180; Essential Water pricing proposal to IPART, Addendum, September 2018.

Essential Water has not included all costs in its proposed revenue requirement

As outlined in Chapter 1, the total cost for Essential Water to supply water to its customers can be split into the following three components:

- 1. The costs of bulk water that is supplied to Broken Hill, which we determined in our 2017 determination of WaterNSW prices for its rural bulk water services.⁴⁸
- 2. The costs of transporting bulk water through the Broken Hill pipeline to Essential Water. The construction, maintenance and operating costs of the Broken Hill pipeline will be assessed in our review of WaterNSW prices for its pipeline services to Essential Water, which we are running concurrently to this review. The WaterNSW pipeline review would establish the share of these costs that should be notionally attributed to Essential Water.⁴⁹
- 3. Expenditure incurred by Essential Water for its existing water network. This includes:
 - 'business as usual' expenditure such as refurbishments of reservoirs, water treatment plant upgrades, and renewing water mains and reticulation pipes, and
 - any costs for capital works that might be required to service customers, as a result of the Broken Hill pipeline (consequential works).

However, Essential Water's proposed revenue requirement does not include:

- The costs of building and operating the Broken Hill pipeline that WaterNSW proposes should be attributed to Essential Water. WaterNSW proposed that these costs are around \$30 million per year.⁵⁰
- Capital and operating expenditure for consequential works that Essential Water considers are required as a result of the Broken Hill pipeline. Essential Water estimated that the capital costs for these works is around \$59 million over the next four years, with operating expenditure of \$0.4 million per year.

Essential Water's proposed NRR also does not include the capital costs for the final 40km of the pipeline, from the final pumping station (and storage facility), to Essential Water's existing water network.⁵¹ This is referred to as the "SP2" portion of the project.⁵² These costs have been excluded because Essential Water considers that SP2 costs will be directly funded by the NSW Government and be 'gifted' to Essential Water at nil value.

Essential Water has smoothed its proposed revenue requirement

Essential Water has calculated a 'target revenue' to calculate customer tariffs. The target revenue smooths the notional revenue requirement in present value terms, over the determination period, to produce smoothed price changes for both customers and Essential Water.

⁴⁸ IPART, Review of prices for WaterNSW rural bulk water services from 1 July 2017 to 30 June 2021 – Final Report, June 2017. Available at: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WaterNSW%e2%80%99s-Rural-Bulk-Water-Services-from-1-July-2017-formerly-State-Water-Corporation?qDh=3, accessed on 24 August 2018.

⁴⁹ IPART, *Review of prices for WaterNSW's Murray River to Broken Hill Pipeline services from 1 July 2019.* Available at: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WaterNSW%e2%80%99s-Murray-River-to-Broken-Hill-Pipeline-services-from-1-July-2019, accessed on 24 August 2018.

⁵⁰ WaterNSW pricing proposal to IPART, June 2018, p 49.

⁵¹ Essential Water has included the operating costs for this section of the pipeline in its revenue requirement.

⁵² Essential Water pricing proposal to IPART, July 2018, p 57.

Our usual practice has also been to set prices so that the present value of target revenue over the determination period equals the present value of the NRR (ie, efficient costs) over this period. This generally results in a cumulative target revenue that is close, but not identical, to the cumulative notional revenue requirement over the determination period.

5.2 IPART's response on proposed revenue requirement

As discussed in Chapter 3, our proposed framework is to consider the full efficient costs of supplying water and sewerage to Essential Water's customers (until we receive confirmation of any NSW Government funding contribution). Indicatively, if all proposed costs of supplying water to Essential Water's Broken Hill customers were included in prices (that is, including full costs of the Broken Hill pipeline and consequential works), our initial analysis suggests these costs would be about \$59 million a year, on average, over the next four years (Figure 5.1).



Figure 5.1 Indicative total proposed costs of supplying water to Essential Water's customers

Note: Excludes the costs for the final 40km of the Broken Hill pipeline, from the final pumping station to Essential Water's existing water network. This is referred to as the "SP2" portion of the project. These costs have been excluded because Essential Water expects these costs to be directly funded by the NSW Government and 'gifted' to Essential Water at nil value. **Source:** Essential Water pricing proposal to IPART, July 2018; Essential Water pricing proposal to IPART, Addendum, September 2018; WaterNSW pricing proposal to IPART, June 2018; IPART analysis.

Some of the proposed costs may not be efficient

As part of this review, we will assess whether Essential Water's proposed expenditure represents that best way to meet customer needs. In particular, Essential Water has proposed (but excluded these costs from its proposed prices) a significant body of consequential works, with capital works totalling \$59 million.⁵³ The largest project involves refurbishing Stephen's Creek reservoir, pump station and sections of the pipeline between Stephen's Creek and

⁵³ These consequential works would also add to Essential Water's operating costs and tax allowance. In addition, Essential Water has not included any tax allowance for gifted assets (relating to the final section of the Broken Hill pipeline, also known as the "SP2" portion of the project). Essential Water expects the NSW Government to 'gift' SP2 assets to Essential Water at nil value (ie, if gifted at nil value, this would have no impact on the tax allowance).

Broken Hill. We will investigate whether these works are needed. Given that the Broken Hill pipeline will provide a new reliable source of water, maintaining operations at Stephen's Creek reservoir may not be economic. Furthermore, replacing the Stephen's Creek to Menindee pipeline (at a cost of \$10 million) to maintain supply to 11 graziers may not be the most cost-effective way to supply water to these customers.

To inform our decisions on the NRR, we are interested in stakeholders' views on whether Essential Water's past expenditure was prudent and efficient, and whether its proposed expenditure is efficient.

IPART seeks comments on the following

11 Is Essential Water's proposed expenditure (including consequential works) for the 2019 determination period reasonable?

6 Allowance for operating expenditure

The allowance for operating expenditure within the notional revenue requirement reflects our view of the efficient level of operating costs Essential Water will incur in managing its network. These include the costs of labour, energy, materials, plant and equipment.

This chapter outlines:

- Essential Water's actual operating expenditure for the 2014 determination period
- Essential Water's proposed operating expenditure for the 2019 determination period
- the estimated operating expenditure for bulk water transportation costs and consequential works, and
- our initial response to Essential Water's proposed operating expenditure.

6.1 Essential Water's operating expenditure during the 2014 determination period and 2018-19 financial year

Essential Water's actual operating expenditure for the 2014 determination period was \$66.9 million (Table 6.1). This is \$8.0 million (13.5%) more than IPART's allowance in the 2014 determination of \$58.9 million. Essential Water attributes much of this variance to unanticipated costs associated with the 2014-16 drought, which included:

- Additional electricity costs from pumping more water than forecast from the Menindee Lakes. This increase in pumping was also compounded by an unanticipated increase in electricity prices.
- Recommissioning and operating the Broken Hill Reverse Osmosis desalination plant.
- A higher allocation of corporate overheads to operating expenditure due to the deferral of capital projects.⁵⁴

Essential Water forecasts that it will spend \$16.6 million on operating expenditure in 2018-19. IPART did not set an allowance for 2018-19 as it was beyond the end of the 2014 determination period.

\$ millions	2014-15	2015-16	2016-17	2017-18	Total 2014 period	2018-19
Actual/ Forecast	14.4	16.8	17.6	18.1ª	66.9	16.6ª
IPART allowance	15.0	14.7	14.8	14.3	58.9	N/A
Variance	-0.6	2.1	2.8	3.8	8.0	N/A

Table 6.1	Essential	Water's p	orevious	operating	expenditure	(\$2018-19))
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Note: Columns may not sum due to rounding.

Source: Essential Water pricing proposal to IPART, July 2018, p 135.

⁵⁴ Essential Water pricing proposal to IPART, July 2018, pp 136-138.

a Forecast.

6.2 Essential Water's proposed operating expenditure

Excluding bulk water transportation costs and consequential works, Essential Water has proposed operating expenditure of \$57.3 million over the 2019 determination period. After accounting for inflation, this is \$1.6 million (2.7%) less than IPART's previous allowance for the 2014 determination period.

\$ millions	2019-20	2020-21	2021-22	2022-23	Total
Water	9.5	8.9	9.0	9.5	36.9
Sewerage	2.9	2.8	2.9	3.1	11.6
Corporate	2.2	2.1	2.1	2.3	8.7
Total	14.7	13.8	14.0	14.8	57.3

Table 6.2 Essential Water's propose	ed operating expenditure over the 2019 determination
period (\$2018-19)	

Note: Columns and rows may not sum due to rounding.

Source: Essential Water pricing proposal to IPART, July 2018, p 140.

Essential Water proposes to achieve operating expenditure savings in the 2019 determination period by:

- decommissioning the Menindee Lakes pipeline and associated pumping stations
- closing the Sunset Strip water filtration plant and supplying the town with water from a new, larger plant in Menindee
- decommissioning the Broken Hill reverse osmosis desalination plant
- reducing fleet and labour costs across the business, and
- re-allocating corporate overheads between Essential Energy's water and energy businesses.

Essential Water proposes that significant new operating costs from operating its portion of the Murray River to Broken Hill pipeline (the final 40km of the pipeline) will offset most of these savings.

As Table 6.3 shows, most of Essential Water's operating expenditure components are expected to increase by between 3% and 17% between 2018-19 and 2022-23 in real terms, except for energy and corporate overheads, which are estimated to fall by 54% and 11% respectively.

and co	and consequential works) (\$2010-19)					
\$ millions	2018-19	2019-20	2020-21	2021-22	2022-23	Change 2018-19 to 2022-23
Labour	5.9	6.6	6.0	6.0	6.1	3%
Contractors	1.0	1.0	1.0	1.0	1.1	10%
Materials	2.1	2.2	2.1	2.1	2.3	10%
Energy	3.9	1.4	1.4	1.5	1.8	-54%
Licence fees	0.4	0.3	0.3	0.4	0.4	8%
Fleet	0.8	0.9	0.9	0.9	0.9	17%
Desalination plant	0.1	0.0	0.0	0.0	0.0	N/A
Corporate						

2.1

13.8

2.1

14.0

2.3

14.8

-11%

-11%

Table 6.3 Essential Water's operating expenditure components (excluding pipeline costs and consequential works) (\$2018-19)

Note: Percentage changes may not match column values due to rounding.

2.5

16.6

Source: Essential Water annual information return, July 2018.

Overheads

Total

6.3 Bulk water transportation costs from the Murray River to Broken Hill pipeline

2.2

14.6

From mid-2019, Essential Water plans to access the majority of its bulk water from WaterNSW's Murray River to Broken Hill pipeline. The costs of transporting water through the pipeline will become a recurring operating expense for Essential Water.

IPART is currently determining the maximum prices WaterNSW can charge Essential Water for purchasing bulk water from the pipeline through a separate, but concurrent, review. Consistent with the Minister's section 16A direction, ⁵⁵ we intend to set WaterNSW's prices to Essential Water so that WaterNSW can recover the efficient costs of building, operating and maintaining the pipeline (in the WaterNSW pipeline price review).

WaterNSW proposes to charge Essential Water roughly \$32 million per year for accessing water from the pipeline (in \$2018-19, see Box 6.1). If added to Essential Water's proposed operating expenditure, these charges would make up more than two thirds of Essential Water's future operating expenditure (see Figure 6.1). Operating costs for consequential works are proposed to be \$0.4 million per annum from 2019-20 to 2022-23.

IPART is seeking stakeholder views on WaterNSW's proposed charges to Essential Water as part of our separate review of WaterNSW's pipeline prices.

Essential Water has not included bulk water transportation costs from WaterNSW in its operating expenditure forecasts for this price review. Instead, it expects the Government will provide a contribution to cover all capital, operating and maintenance costs of the pipeline.

⁵⁵ NSW Government, Direction to IPART in relation to the construction and operation of the Broken Hill pipeline 2018, 19 April 2018. Available at: https://www.ipart.nsw.gov.au/files/sharedassets/website/sharedfiles/pricing-reviews-water-services-rural-water-prices-for-waternsw-murray-river-to-broken-hill-pipelineservices-from-1-july-2019/legislative-requirements-prices-for-waternsw-murray-river-to-broken-hill-pipelineservices-from-1-july-2019/section-16a-letter-and-direction-the-construction-and-operation-of-the-broken-hillpipeline-2018-19-april-2018.pdf, accessed on 24 August 2018.

If this does not occur, it has proposed a cost pass-through mechanism to recover some, or all, of these costs from its customers via prices.



Figure 6.1 Essential Water's total operating expenditure

Source: Essential Water pricing proposal to IPART, July 2018; WaterNSW pricing proposal to IPART, June 2018; IPART analysis.

Box 6.1 WaterNSW's proposed charges for the Murray River to Broken Hill pipeline

WaterNSW is proposing to charge Essential Water an estimated \$32m per year to access water from the Murray River to Broken Hill pipeline. WaterNSW's proposed charges include:

3.	Fixed charge	approx. \$27m per year			
4.	Fixed operational and maintenance charge	approx. \$1.6m per year			
5.	Fixed electricity charge	approx. \$0.03m per year			
6.	Electricity demand charge	approx. \$0.8m per year			
7.	Variable charge	from \$2,000/ML falling to \$300/ML based on weekly demand			
8.	Shutdown payment	from \$1.1m up to \$12m per event based on length of event			
9.	Restart payment	from \$600 up to \$10,000 per event based on length of event			
10.	Standby payment	approx. \$4,000 per day			
11.	Early water service charge ^a	approx. \$400/ML			
a This charge will only apply in the event that water is called on between the date of completion of the pipeline (December 2018) and prior to commission (April 2019).					
Source	e: IPART analysis of WaterNSW pricing submission to IPART, Ju	une 2018.			

6.4 Operational expenditure for the consequential works

Essential Water has also excluded operating and maintenance costs for consequential works from its proposed operational expenditure for the purpose of setting prices. However, these costs would be comparatively minor, increasing its operating expenditure by around \$0.4 million per year.

Essential Water also expects to recover the operating costs for consequential works through a government contribution. Similarly, if this does not occur, it has proposed a cost pass-through mechanism to recover some, or all, of these costs from customers.

6.5 IPART's response on proposed operating expenditure

We have not formed a preliminary position on Essential Water's proposed operating expenditure. To inform our draft decision on Essential Water's proposal, we will engage an expert consultant to review the efficiency of the proposed operating expenditure. This will involve examining whether the proposed expenditure is the best way of meeting customer needs for the water and sewerage services. In making our draft decision, we will also consider stakeholders' responses to this Issues Paper and the views and information provided at the public hearing.

In reviewing Essential Water's proposed operating expenditure, a key area that we will focus on is the impact of the Murray River to Broken Hill pipeline on Essential Water's operating expenditure. For example:

- A large portion of Essential Water's electricity costs are for pumping water from the Menindee Lakes. Decommissioning the existing Menindee pipeline should significantly lower those costs.
- Decommissioning the Menindee pipeline and Sunset Strip water filtration plant should reduce Essential Water's material and maintenance costs, given they will no longer have to manage these deteriorating assets.
- Decommissioning Imperial Lake, which is currently used as an emergency raw water storage, should also reduce costs.
- Water from the Murray River has much lower salinity and turbidity than water from the Darling River (Figure 6.3), which means that Essential Water will not need to desalinate its raw water in future, thus lowering costs. However, Essential Water has raised concerns that Murray River water may be more corrosive than Darling River water, and potentially cause damage to its water pipes. To address this issue, Essential Water proposed extra CO₂ and lime dosing of raw water at the Mica Street Water Treatment Plant, which will increase water treatment costs.



Figure 6.2 Salinity in the Murray and Darling Rivers

Source: Murray-Darling Basin Authority.

We also note that there is unexplained volatility in some of the proposed operating expenditure items. For example, energy costs increase significantly in 2018 and 2019 but then decrease in 2020. Energy costs then begin to grow after 2020, even though demand for water is forecast to decline.

In addition, we will consider the impact of other proposed changes to Essential Water's water and sewerage operations. We will also consider Essential Water's plan to re-allocate corporate overheads between its water and power businesses under the Australian Energy Regulator's (AER) approved cost allocation methodology.

Operating expenditure for bulk water transportation costs and consequential works

We will assess Essential Water's total efficient operating costs of providing its water and sewerage services to its customers over the 2019 determination period. This includes the bulk water transportation costs and consequential works that Essential Water has excluded from its pricing proposal.

We do not consider it appropriate to adopt a cost pass-through mechanism to recover some, or all, of the costs of bulk water transportation and consequential works from customers in the event that the government does not fund these costs. Our view is that a cost pass-through for these events would not be consistent with our criteria (see Box 4.3 in Chapter 4).

As outlined in Chapter 3, once we determine Essential Water's total efficient costs, we will then determine:

- the share of these costs that should be notionally allocated to its customers, applying the impactor pays principle, and
- the share of these costs that should actually be recovered from customers through prices, taking into account factors such as what customers can afford to pay.

IPART seeks comments on the following

- 12 Are Essential Water's proposed operating costs over the 2019 determination period efficient, taking into account the drivers of this expenditure and the impact of the Broken Hill pipeline?
- 13 What scope is there for Essential Water to achieve efficiency gains over the 2019 determination period?

7 Prudent and efficient capital expenditure

There is no explicit allowance for capital expenditure in the notional revenue requirement under the building block method. Instead, prudent and efficient capital expenditure is added to the Regulatory Asset Base (RAB) and recovered gradually through customer tariffs over the life of the assets. First we consider the prudency and efficiency of Essential Water's capital expenditure over both the 2014 determination period and looking forward to the 2019 determination period, and roll the prudent and efficient capital expenditure into the RAB. We then recover the prudent and efficient costs by setting allowances for a return on assets and regulatory depreciation (which is discussed in Chapter 8).

This chapter outlines how we propose to establish the prudent and efficient capital expenditure. It discusses:

- Essential Water's actual capital expenditure during the 2014 determination period (including capital expenditure on emergency drought management works).
- Essential Water's proposed capital expenditure for the 2019 determination period including:
 - its proposed approach to pipeline and consequential works,
 - its major proposed capital works projects, and
 - changes to its long term water operations.
- Our preliminary response to Essential Water's proposal.

7.1 Our approach for establishing prudent and efficient capital expenditure

To decide how much capital expenditure is added to the RAB, we will review Essential Water's proposal and apply:

- A prudence test to its actual capital expenditure over the 2014 determination period (past capital expenditure). When calculating the starting value of the RAB at the beginning of the 2019 determination period, we would only include capital expenditure for the 2014 determination period that we consider to be prudent. Our prudence test for historical capital expenditure is explained in Box 7.1.
- An efficiency test to its proposed capital expenditure for the 2019 determination period (forecast capital expenditure). The efficiency test examines whether the proposed capital expenditure represents (over the life of the asset) the best way of meeting customers' needs, subject to the utility's regulatory requirements.

We will incorporate forecast prudent and efficient capital expenditure into the value of the RAB over the 2019 determination period, and then use this RAB value in calculating the allowances for a return on assets and regulatory depreciation.

Box 7.1 Prudence test and efficiency test

Prudence test

The prudence test assesses whether, in the circumstances that existed at the time, the decision to invest in an asset is one that Essential Water, acting prudently, would be expected to make.

The test assesses both:

- the prudence of how the decision was made to invest, and
- the prudence of how the investment was executed (ie, the construction or delivery of the asset), having regard to information available at the time.

Efficiency test

In reviewing expenditure, the efficiency test is used to set how much of Essential Water's proposed expenditure (operating and capital) for the 2019 determination period will go into our determination of Essential Water's revenue requirement. The efficiency test should examine whether Essential Water's actual and proposed expenditure represents the best and most cost effective way of delivering the monopoly services. The efficiency test examines whether the proposed capital expenditure represents the best way of meeting customers' needs (over the life of the asset), subject to the utility's regulatory requirements.

7.2 Essential Water's capital expenditure over the 2014 determination period and 2018-19 financial year

Essential Water's actual capital expenditure for the 2014 determination period was \$36.4 million (see Table 7.1). This is \$6.2 million (15%) less than IPART's allowance of \$42.6 million when it set prices in 2014. This does not include a \$13.8 million Government grant Essential Water received to undertake emergency drought works (see Box 7.2).

Essential Water forecasts its capital expenditure in 2018-19 will be \$16.2 million. IPART did not set an allowance for 2018-19 in the 2014 determination, however we will still consider the prudency and efficiency of Essential Water's 2018-19 expenditure when determining the starting value for the RAB (see section 8.1.1).

Table 7.1 Essential Water's previous capital expenditure (excluding emergency drought works) (\$2018-19)

\$ millions	2014-15	2015-16	2016-17	2017-18	Total 2014 Regulatory Period	2018-19
Actual/ Forecast	6.8	15.4	6.0	8.2 ^a	36.4	16.2ª
IPART allowance	8.4	7.7	12.9	13.6	42.6	N/A
Variance	-1.6	7.8	-7.0	-5.4	-6.2	N/A

a Forecast.

Note: Columns may not sum due to rounding.

Source: Essential Water pricing proposal to IPART, July 2018, p 119.

Essential Water provided the following explanations for actual capital expenditure being below IPART's allowance:⁵⁶

- Uncertainty surrounding new bulk water supply arrangements. Following the NSW Government's announcement of the new Murray River to Broken Hill pipeline, Essential Water reviewed and reprioritised its investment capital program to only invest in projects it considered were necessary once the details of the new supply arrangement were known.
- The impact of drought conditions. Essential Water reallocated resources to construct the emergency drought works (outlined in Box 7.2). As noted below, this capital expenditure was separately funded using a NSW Government grant.

Box 7.2 Emergency drought works

From late 2014 until mid-2016, a prolonged drought contributed to low flows in the Darling River and low water levels in the Menindee Lakes. Broken Hill City Council responded by implementing water restrictions during 2015.

As the drought worsened, Essential Water changed its water source from the Menindee Lakes to the Darling River, which increased the salinity of Essential Water's raw water. The salt levels were not hazardous to human health, but the water was unpalatable and risked damaging household appliances such as evaporative air conditioners.

Because Essential Water's Mica Street Treatment Plant was not designed to remove excess salt, additional pre-treatment was required. In the 2015-16 Budget, the NSW government granted Essential Water \$13.8 million from the Restart NSW fund for emergency drought works. This grant was used to construct a new reverse osmosis plant desalination plant, an associated pipeline, and a brine evaporation pond.

The reverse osmosis plant was operated from December 2015 until September 2016, when local rain meant Essential Water was able to use water from Stephens Creek Reservoir until water quality improved in the Darling River. Since then, three of the seven reverse osmosis units at Mica Street have been decommissioned and removed, and the four remaining units have been run in care and maintenance mode.

Source: Essential Water pricing proposal to IPART, July 2018, p 61; Essential Energy *Annual Report 2015-16*, p 63; NSW Legislative Council General Purpose Standing Committee No.5, Water Augmentation, transcript of hearing 26 October 2016 (testimony of John Coffey, Essential Water) pp 38, 43.

7.3 Essential Water's proposed capital expenditure for the 2019 determination period

Essential Water has proposed to spend \$65.7 million over the proposed four-year 2019 determination period on capital expenditure (Table 7.2). This is \$23.1 million (54%) more than IPART's allowance for the four-year 2014 determination period, in real terms.

⁵⁶ Essential Water pricing proposal to IPART, July 2018, p 120.

\$ millions	2019-20	2020-21	2021-22	2022-23	Total
Water	9.5	3.9	1.8	3.5	18.6
Sewerage	2.2	13.4	13.4	4.6	33.6
Non-system ^a	1.6	1.0	0.8	0.8	4.1
Corporate ^b	2.1	3.1	2.7	1.5	9.4
Total	15.4	21.3	18.6	10.3	65.7

Table 7.2 Essential Water's proposed capital expenditure for the 2019 period (\$2018-19)

a: Non-system capital expenditure includes IT systems, furniture, fittings, plant and equipment, fleet and buildings.

 $\ensuremath{\textbf{b}}$: Corporate overheads are calculated as 15% of direct capital expenditure.

Note: Columns and rows may not sum due to rounding.

Source: Essential Water pricing proposal to IPART, July 2018, Table 6-5, p 121.

The subsections below outline:

- the major capital works included in Essential Water's proposal
- the consequential works, and Essential Water's rationale for excluding these costs from its pricing proposal, and
- the capital costs from the Broken Hill pipeline, and why these costs have also been excluded from its pricing proposal.

7.3.1 Essential Water's major capital works projects

Essential Water's capital expenditure proposal includes a number of large projects, which are listed in Table 7.3.

Project	Capital expenditure \$ millions	Description
Wills Street wastewater treatment plant replacement	34.3	Replace Broken Hill's larger wastewater treatment plant, which Essential Water argues is too old to comply efficiently with environmental regulations.
Rocky Hill service reservoir replacement	4.4	Construct a second smaller service reservoir at Rocky Hill to allow the main reservoir to be taken off-line for maintenance.
Broken Hill reticulation replacement	3.2	Part of Essential Water's ongoing preventative maintenance plan to replace 1km /year of water reticulation pipes.
Sewer reticulation replacement	3.0	A new program to reline or replace priority sewer lines in Broken Hill.
Mica Street treatment plant capital works	2.8	Routine upgrades to Broken Hill's main water treatment plant.
Service Reservoir Refurbishments	2.5	Refurbishment works across Essential Water's seven service reservoirs.
Menindee water treatment plant works	1.8	Replace the Menindee water treatment plant.
Mica Street Service reservoir replacement	1.6	Replacement of a storage reservoir.
Sewerage pump station refurbishment/overhauls	1.4	Routine upgrades to sewerage pumping stations.
Stephen's Creek Dam Wall Rehabilitation	1.3	Dam safety upgrades on the Stephen's Creek dam wall.
Water pump station refurbishment/overhauls	1.2	Refurbishment of pump stations not associated with the pipeline or consequential works.

Table 7.3Essential Water's proposed major non-corporate capital projects (excluding
consequential works) (\$2018-19)

Note: Capital expenditure figures include overheads.

Source: Essential Water pricing proposal to IPART, July 2018, p 123-25.

The proposed Wills Street sewerage treatment plant replacement is the largest capital expenditure item (\$34.2 million out of \$65.7 million total proposed capital expenditure). The Wills Street treatment plant is the larger of Essential Water's two sewerage treatment assets (the other being South Broken Hill wastewater treatment plant). Essential Water has proposed replacing this plant because it is roughly 80 years old and needs frequent remediation to meet environmental discharge requirements. Given the cost of this project, establishing the prudency and efficiency of replacing the plant will be a focus of this review.

7.3.2 Essential Water's pricing proposal excludes capital costs for consequential works

Essential Water has proposed consequential works projects to transition its water supply network to the Murray River to Broken Hill pipeline. However, it has excluded these costs from its pricing proposal because it is seeking separate funding from the NSW Government. A list of these projects is included in Table 7.4. Essential Water estimates capital cost for the works at \$59.0 million (including overheads and contingencies), with an ongoing operating
cost of \$0.4 million per year. Essential Water plans to undertake the works over three years from 2018-19 to 2020-21.

Project	Cost \$ millions	Description
Stephen's Creek reservoir, pump station, and Rocla pipeline	31.5	 Essential Water plans to transition Stephen's Creek reservoir from being Broken Hill's main water source to a back-up in case the Murray River to Broken Hill pipeline fails. This would involve: replacing the Stephen's Creek pump station, and replacing or refurbishing sections of the Rocla pipeline between Stephen's Creek reservoir and Broken Hill.
Replacement supply for customers along the Menindee Lakes pipeline	12.3	 Currently, Essential Water provides water to the Menindee Lakes caravan park, the community of Sunset Strip, and 11 graziers from off-takes along the Menindee Lakes Pipeline. When the pipeline is decommissioned Essential Water proposes to supply: the caravan park and Sunset Strip from a new pipeline from the Menindee water treatment plant (\$1.5 million), and the graziers with a new gravity fed pipeline from Stephen's Creek reservoir (\$10.8 million).
Mica street treatment plant raw water filters	3.0	Recommissioning unused raw water filters at the Mica Street water treatment plant to protect against blue-green algae from the new bulk storage facility.
Decommissioning brine pond and pipeline	10.0	Decommissioning the brine evaporation pond and pipeline for the town's RO desalination plant, including remediating the site. The land will returned to Perilya, who will retain the earthworks to use as a future tailings dam.

Table 7.4Essential Water's proposed consequential works (excluding contingencies)
(\$2018-19)

Source: Essential Water pricing proposal to IPART, July 2018, pp. 127-131.

To reduce affordability pressures on customers, Essential Water is seeking separate Government funding for the full cost of the consequential works. Because of this, Essential Water has not included these costs in its proposed capital expenditure allowance for pricing purposes.

In the event that the Government does not fund the cost of these capital works, Essential Water has proposed a cost pass-through mechanism to recover some, or all, of these costs from customers (including operational costs).

If Essential Water does not receive grant funding, the consequential works would significantly increase its proposed capital expenditure (Figure 7.1).



Figure 7.1 Essential Water's proposed capital expenditure and consequential works

7.3.3 Essential Water's proposal excludes pipeline costs

WaterNSW was directed by the Government to build, operate and maintain the Murray River to Broken Hill pipeline. Essential Water is not involved in construction and has not included any pipeline capital expenditure in its pricing proposal.

WaterNSW will recover its efficient capital expenditure (and other costs) for the pipeline through bulk water charges to Essential Water. We consider these charges should form part of Essential Water's operational expenditure (see section 6.3). IPART is considering the efficiency of WaterNSW's expenditure on the pipeline through our separate, concurrent review of WaterNSW's pipeline transportation prices.

However, the ownership of the final 40km of the pipeline to Essential Water's water treatment plant at Mica Street, and a pump station, will be transferred from WaterNSW to Essential Water (the "SP2" portion of the project). Essential Water expects that these assets will be "gifted" to Essential Water at no cost, ie, that the Government will fund these assets directly.⁵⁷ Therefore, Essential Water's proposed NRR does not include the capital costs for these assets.

7.4 IPART's response on capital expenditure

IPART does not have a preliminary position on the prudency and efficiency of Essential Water's historical or proposed capital expenditure. To inform our draft decision, we will engage a consultant to review the prudence of its past capital expenditure and efficiency of its forecast capital expenditure. This will involve using the prudence and efficiency tests described above in Box 7.1, where appropriate.

We will also consider views and information provided by stakeholders in written submissions in response to this Issues Paper, and at the public hearing.

Sources: Essential Water pricing proposal to IPART, July 2018; IPART analysis.

⁵⁷ Essential Water pricing proposal to IPART, July 2018, p 57.

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The consequential works should be treated like other capital expenditure

Our preliminary view is that the consequential works should be treated like other capital expenditure, and that Essential Water's prudent and efficient costs for these projects should be included in the RAB in calculating Essential Water's NRR (total efficient costs).

If the Government chooses to grant fund some, or all, of these costs, and this contribution is confirmed during this price review, then we would deduct this contribution from the RAB (as we would for other grants or contributions) in calculating Essential Water's NNR.

Our preliminary view is that Essential Water's proposed cost pass-through is not an appropriate way to fund the consequential works, as this would not be consistent with our cost pass through criteria (see Box 4.3 in Chapter 4).

As outlined earlier, we plan to determine Essential Water's total efficient costs of delivering its water and sewerage services to customers (including its direct and consequential costs of the pipeline), and then determine what share of these costs customers should pay through prices.

Maintaining operations at existing reservoirs may not be economic

Essential Water proposes to construct pipelines and pumping stations to maintain operations at the Stephens Creek reservoir, as well as construct a new off-line storage facility near Stephens Creek.

The objective of these works is to increase reliability for Broken Hill water customers. However, according to customer survey results, 67% of customers think that Essential Water is performing very well on providing a reliable water supply. Furthermore, the Broken Hill pipeline will already be a significant improvement in reliability than the status quo, given:

- drought conditions and water restrictions in the last determination period, and
- the poor condition of the Menindee pipeline network, as identified by Essential Water.

This preliminary analysis suggests that some, or all of this capital expenditure may not be economic.

Large share of costs are to supply eleven graziers

Essential Water proposes to replace the Stephens Creek to Menindee pipeline to maintain supply to eleven graziers along the Menindee pipeline, at a cost of \$10 million. In addition, refurbishing the Stephens Creek portion of the network could also be used to service the graziers.

We propose to:

- consider whether this expenditure is the most cost-effective method to supply water to these customers, and
- provide transparency over the full costs of providing water services to the graziers, relative to the remaining customer base.

Brine pond disposal costs

Essential Water proposes to decommission the brine pond associated with the reverse osmosis plant at a cost of \$10 million.⁵⁸

The brine pond was constructed by Essential Water on land leased from mining company Perilya. Essential Water is required to decommission the brine pond in accordance with environmental regulations, and return the land to Perilya by August 2020.

According to Essential Water, after decommissioning the site, Perilya may use the pond as a tailings dam in the future.

We propose to investigate whether the proposed costs of decommissioning the pond (removing salts, dam liner and pipework):

- are efficient, and
- could be partially paid for by Perilya, to the extent that Perilya values the land improvements that are beyond environmental regulations, and are willing to negotiate with Essential Water.

Defer replacing the Wills Street sewerage treatment plant

As part of its pricing proposal for the 2014 determination, Essential Water proposed replacing the Wills Street sewerage treatment plant from 2017-18.⁵⁹ However, we decided not to include an allowance for this proposed expenditure in the NRR, as we considered that Essential Water could defer this expenditure.

In this review, we will consider whether the replacement of the Wills Street sewerage treatment plant is required in the 2019 determination period, or whether the savings from delaying this expenditure are greater than the increased operating costs of maintaining the existing plant.

Ability to deliver capital program

In the 2014 determination period, Essential Water delayed much of its planned capital expenditure program while it was constructing the reverse osmosis plant to manage the drought. The sum of the proposed capital works and consequential works in the 2019 determination is more than double what was spent in the 2014 determination.

We have asked our consultants to investigate Essential Water's capacity and ability to deliver its proposed scope of capital works within the 2019 determination period.

IPART seeks comments on the following

- 14 Is Essential Water's capital expenditure over the 2014 determination period prudent?
- 15 Is Essential Water's forecast capital expenditure efficient, including expenditure for consequential works?

⁵⁸ Essential Water pricing proposal to IPART, July 2018, p 126.

⁵⁹ Essential Water pricing proposal to IPART, September 2013, p 42.

- 16 Is constructing a new pipeline from Stephen's Creek reservoir the most efficient method of providing water to the 11 graziers?
- 17 Is replacing the Wills Street sewerage treatment plant in the 2019 determination period efficient?

8 Allowances for return on assets, regulatory depreciation and tax liabilities

The building block model includes allowances for a return on assets, regulatory depreciation (or a return **of** assets), taxation, and a return on working capital. To calculate the allowances for a return on assets and regulatory depreciation, we need to determine three key inputs:

- the value of Essential Water's regulatory asset base (RAB), which represents the economic value of the assets Essential Water uses to provide regulated water and wastewater services
- the appropriate asset lives for Essential Water's existing and new assets and the depreciation method for Essential Water's RAB, and
- the appropriate rate of return on Essential Water's RAB.

This chapter discusses Essential Water's proposals for these inputs, its proposed tax and return on working capital allowances, and our preliminary responses to these proposals. In discussing the return on assets, we highlight:

- The specific WACC parameters that, in our 2018 WACC Final Report, we decided we would seek comment on in subsequent price reviews.
- That the funding arrangements to recover Essential Water's efficient costs may have implications for the return on assets. If a government contribution to Essential Water's efficient costs is appropriate, the structure of this subsidy could impact the allocation of financial risks that Essential Water faces, which could impact the appropriate return on its assets.

8.1 Valuing the RAB

To determine the value of Essential Water's RAB over the 2019 determination period, our standard method is to:

- Determine the opening RAB for the 2019 determination period. We take the RAB value we determined at the start of the 2014 period (the opening RAB) and incorporate Essential Water's prudent and efficient actual capital expenditure over that period (discussed in Chapter 7), and make adjustments to account for other changes to the RAB over the period (eg, asset disposals, capital contributions and regulatory depreciation).
- Forecast the RAB for each year of the 2019 period. We then roll forward this opening RAB to the end of the 2019 determination period by including prudent and efficient forecast capital expenditure over the period (discussed in Chapter 7), and making adjustments to account for other forecast changes to the RAB.

8.1.1 Essential Water's proposed RAB

Starting value of the RAB

Essential Water proposed an opening RAB for 1 July 2019 of \$135.3 million, a \$40.7 million nominal increase on the opening RAB for the 2014 determination period (Table 8.1).

To establish this RAB, Essential Water applied our standard method and assumed that all of its capital expenditure over the 2014 period was prudent and efficient and should be included in the opening RAB (excluding emergency drought works).

				1. 1	
\$ millions	2014-15	2015-16	2016-17	2017-18	2018-19
Opening RAB	94.6 ^a	100.3	105.7	110.4	118.5 ^b
<i>Plus</i> capex ^c	6.3	6.5	5.0	8.0	16.2 ^b
Less depreciation	2.1	2.2	2.3	2.5	2.5
Less asset disposals	-	-	-	-	-
Plus indexation	1.5	1.0	2.1	2.6	3.2
Closing RAB	100.3	105.7	110.4	118.5	135.3

Table 8.1 Essential Water's calculated RAB values for 2014-2019 (\$ nominal)

a This value differs from the opening RAB value published in the 2014 determination due to an adjustment for actual vs forecast inflation.

b Forecast.

c Excludes capital contributions for emergency drought works.

Source: Essential Water pricing proposal to IPART, July 2018, Table 8-4, p 161.

Rolling forward the RAB over the 2019 determination

Essential Water has estimated its closing RAB for each year of the proposed 2019-23 regulatory period by rolling forward its RAB to add its proposed capital expenditure and subtract proposed depreciation (Table 8.2). This would result in the value of its RAB increasing by \$51.5 million (38%) in real terms over the proposed regulatory period.

Table 8.2 Essential Water's	calculated RAB ov	er the 2019 de	etermination ((\$2018-19)
				y -

\$ millions	2019-20	2020-21	2021-22	2022-23
Opening RAB	135.3	147.6	165.6	180.4
Plus capital expenditure	15.4	21.3	18.6	10.3
Less depreciation	3.1	3.4	3.7	4.0
Less asset disposals	-	-	-	-
Closing RAB	147.6	165.6	180.4	186.8

Note: Excluding consequential works

Source: Essential Water pricing proposal to IPART, July 2018, Table 8-8, p 163.

We will continue to adopt our standard method to determine the value of the RAB. We will decide what prudent and efficient capital expenditure should be included in the RAB, and will receive advice on this from our expenditure review consultant.

8.2 Regulatory depreciation and asset lives

The allowance for regulatory depreciation is included in the revenue requirement and also used in calculating the value of the RAB, as discussed above. This allowance is intended to ensure that the capital the regulated business (or its owner) invests in the regulatory assets is returned over the useful life of each asset.

To calculate this allowance, we need to determine the appropriate depreciation method to use and the appropriate lives for Essential Water's new and existing assets.

8.2.1 Depreciation methodology

Essential Water proposed to depreciate its water and sewerage assets using a straight-line methodology, consistent with our 2014 determination and our usual approach across the water utilities we regulate. This means that the total value of an asset is recovered evenly over its assumed life.⁶⁰

Our preliminary view is that we will accept Essential Water's proposal, and continue to use the straight-line depreciation method.

8.2.2 Asset lives

Essential Water proposed using the regulatory asset lives for water and sewerage assets that we set in our 2010 determination and maintained in our 2014 determination (Table 8.3). It also proposed a new asset category for corporate assets – which include non-system assets such as IT, buildings, plant and equipment, and motor vehicles – with regulatory asset lives of around 25 years for these assets.

We will ask our consultant to review whether the proposed asset lives for corporate assets are appropriate. Our consultant will also review whether the lives for water and sewerage assets remain appropriate, especially given the change in the composition of water assets with the proposed decommissioning of the Menindee pipeline.

⁶⁰ Under the straight-line depreciation method, the assets in the RAB are depreciated by an equal value in each year of their economic life, so that their real written down value follows a straight line over time, from the initial value of the asset to zero at the end of the asset's life.

Table 8.3 Essential Water's proposed asset lives

	Regulatory life of assets (years)		
	Water	Sewerage	Corporate
New assets (proposed)	98	89	25
New assets (2014 determination)	98	89	
Remaining life of assets (proposed)	50	49	23
Remaining life of assets (2014 determination)	46	47	

Sources: Essential Water pricing proposal to IPART, July 2018, Table 8-5, p 162; IPART, *Essential Energy's water and sewerage services in Broken Hill, Review of prices from 1 July 2014 to 30 June 2018 - Final Report*, June 2014, p 99.

IPART seeks comments on the following

- 18 Should we maintain a straight-line depreciation method for calculating the allowance for regulatory depreciation?
- 19 Are Essential Water's proposed asset lives for existing and new assets appropriate?

8.3 Return on assets

The allowance for a return on assets included in the revenue requirement represents our assessment of the opportunity cost of the capital the regulated business (or its owner) has invested to provide the regulated services, and ensures that it can continue to make efficient capital investments in the future.

To calculate this allowance, we multiply the value of the RAB in each year of the determination period by an appropriate rate of return. We will determine the rate of return using an estimate of the weighted average cost of capital (WACC) – ie, the weighted average cost of debt and equity.

We propose to use our 2018 WACC methodology for calculating the WACC (see Box 8.1 for a summary). Consistent with our 2014 Determination, this method uses a real post-tax WACC to calculate the allowance for a return on assets. Further information on our 2018 WACC methodology is available in our *Review of our WACC Method – Final Report*, published on our website in February 2018.⁶¹

⁶¹ IPART, *Review of our WACC Method – Final Report*, February 2018. Available at: https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Reviews/WACC/WACC-Methodology-2017/20-Feb-2018-Media-Release-on-Final-Report/Media-release-WACC-method-updated-20-February-2018

Box 8.1 Summary of key changes to our WACC method

We use a 'trailing average' approach to calculate both historic and current cost of debt

Our 2013 method set a cost of debt as the midpoint between our estimates of the historic and current cost unless there is significant economic uncertainty, and did not update this cost during the regulatory period. In response to stakeholder feedback that this approach creates a refinancing risk for regulated businesses, we decided to estimate both the historic and current cost of debt using a trailing average approach, which will update the cost of debt annually over the regulatory period.

We update the cost of debt annually within a regulatory period and decide how annual changes are passed through on a case-by-case basis, as part of our price review process.

We considered whether we should update prices to reflect the updated cost of debt annually, or use a regulatory true-up in the notional revenue requirement for the next period, which we would pass through to prices at the beginning of the next period. We decided to determine the most appropriate option on a case-by-case basis, as part of our price review process. Where we decide to use a trueup, we will use the WACC as the discount rate for calculating the true-up.

We use the expected rate of inflation over the regulatory period

We decided to use the expected rate of inflation over the regulatory period. We calculate the expected rate of inflation by first calculating the geometric average of the forecast change in the level of prices over the regulatory period, and then converting this average into an annual inflation rate separately.

8.3.1 Essential Water's proposed WACC

Essential Water proposed that customer tariffs update annually with changes in the cost of debt. Based on this assumption, Essential Water has established its Notional Revenue Requirement and customer tariffs on the assumption that the WACC falls from 4.5% to 4.0% over the 4-year period. It has calculated the decreasing value of the WACC based on predicted changes in the cost of debt.

Table 8.4 sets out Essential Water's proposed WACC and return on assets.

Table 8.4 Essential Water's proposed return on assets (\$2018-19)

	2019-20	2020-21	2021-22	2022-23	Total 2019 determination period
WACC %	4.5	4.2	4.1	4.0	
Return on assets (\$ millions)	6.3	6.5	7.0	7.3	27.1

Source: Essential Water pricing proposal to IPART, July 2018, p 171.

Essential Water's WACC represents the return it requires on its capital assets to service its debts and make a commercial return on equity for its shareholders. Table 8.5 outlines the parameters that Essential Water has proposed for the WACC.

Parameter	Current 2014-19	Proposed 2019-23
Nominal risk-free rate	4.5 per cent	3.4 per cent ^b
Debt margin	2.8 per cent	2.5 per cent ^{a, b}
Cost of debt	7.3 per cent	5.9 per cent ^b
Market risk premium	7.0 per cent	7.6 per cent
Equity beta	0.70	0.70
Cost of equity	9.4 per cent	8.7 per cent
Gearing	55 per cent	55 per cent
Corporate tax	30 per cent	30 per cent
Gamma	0.25	0.25
Inflation	2.9 per cent	2.5 per cent
Post-tax nominal (vanilla) WACC	8.2 per cent	7.2 per cent ^b
Post-tax real WACC	5.2 per cent	4.5 per cent ^b

Table 8.5 Proposed WACC parameters

a Includes 0.125 per cent for debt raising costs.

b Updated annually for cost of debt components.

Source: Essential Water pricing proposal to IPART, July 2018, Table 9-1, p 170.

Essential Water has proposed a gearing ratio of 55%, in line with our 2014 determination. In our 2014 review, we decided to reduce the gearing ratio from 60% (the gearing ratio we generally adopt for regulated water businesses) to recognise that at that time, Essential Water faced a higher level of risk than other metropolitan water utilities.

8.3.2 IPART's response

We reviewed our method for determining the WACC in 2018, and propose to use our 2018 method in this review.⁶² In our final report on this method, we indicated that we would seek comment on certain WACC parameters in subsequent price reviews. The sections below discuss these parameters and our preliminary analysis and views for this review.

Cost of debt

As part of our 2018 WACC methodology, we decided to transition to a trailing average cost of debt. In our view, a trailing average cost of debt allows regulated businesses to better manage their refinancing risk, while maintaining their incentives for efficient investment.

Implementing a trailing average involves updating the cost of debt at the start of each year within a regulatory period. To do this, we need to decide in each price review whether annual changes in the cost of debt will:

- flow through to prices in the subsequent year, or
- be cumulated and passed through via a regulatory true-up in the subsequent regulatory period.

⁶² IPART, *Review of our WACC Method – Final Report*, February 2018. Available at: https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Reviews/WACC/WACC-Methodology-2017/20-Feb-2018-Media-Release-on-Final-Report/Media-release-WACC-method-updated-20-February-2018

Our preliminary position for this price review is that annual changes in the cost of debt should be cumulated and passed through via a regulatory true-up in the subsequent regulatory period. While the two options are equivalent in present value terms to customers and the business, we prefer the regulatory true-up because it provides certainty to customers about their prices over the determination period. With an annual update, a large change in the cost of debt would flow through to customer prices in the following year, unless additional side constraints were imposed in the determination.

We note that, for Essential Water, a regulatory true-up is slightly more complex compared an annual update of prices. However, for this review, we consider that this cost is outweighed by the benefit of certainty to customers about their prices.

Equity beta

The equity beta for a firm measures the relationship between its returns on equity to that of the market as a whole. A firm with more volatile returns than the market would have an equity beta greater than 1, and vice versa.

We also decided in our 2018 WACC methodology review that we would re-estimate the equity beta at each price review. While we may not necessarily change the equity beta at each review, we are mindful that an equity beta analysis outside the current price review may not be sufficiently timely.

To estimate the equity beta, we will use the broadest possible selection of proxy companies to estimate equity beta (but exclude thinly traded stocks). In forming this selection, we seek stakeholder feedback on the comparable industries we should include to establish the proxy companies we use in this review.

Gearing ratio

We consider that we should review the gearing ratio at the same time that we review the equity beta. As for the equity beta, we would not necessarily change the gearing we use in WACC calculations. However, we consider there may be a case for changing the gearing ratio in this review, if we consider that a Government contribution is required to set prices customers can afford.

The reason for this is that our WACC methodology aims to set an appropriate rate of return for a benchmark efficient business providing regulated services, taking into account the risks faced by that business.

In determining the gearing ratio, we would typically consider how these risks are shared between the business and its customers. However, in this review, these risks could also be shared with the NSW Government (if a government grant or subsidy is appropriate to ensure prices are affordable for customers).

This could influence the way we account for these risks. In particular, if we decide that a government grant is appropriate as a safety net measure to ensure that prices are affordable, this would be an additional payment to Essential Water to ensure that it can maintain an economic return. In this case, the government grant could be structured in a way that insulates Essential Water from revenue and cost risks. If it is, then we could argue the risks facing the

business are lower relative to other metropolitan water utilities. Therefore, we could decide on a gearing ratio that is higher than the typical 60% that we generally adopt for regulated water businesses.

Such a decision would be symmetrical with our decision in the 2014 review to adopt a lower gearing ratio than the typical 60% as we considered Essential Water faced a higher level of risk due to the market it operates in (ie, declining demand in a geographically isolated market with a high reliance on 2 large mining customers).

Importantly, we would not set a higher gearing ratio simply because the Government makes a funding contribution – we would only do so if this contribution takes a form that insulates Essential Water from certain risks.

IPART preliminary view

3 That, if a government funding contribution is appropriate, we will consider the potential structure of this contribution and its effect on the risks faced by Essential Water in setting the gearing ratio.

IPART seeks comments on the following

- 20 Is Essential Water's proposed rate of return appropriate?
- 21 Do you agree that we should account for annual changes in the cost of debt over the 2019 determination period through a regulatory true-up in the following period?
- 22 What comparable industries should we consider in establishing the proxy companies we use to re-estimate the equity beta in this review?
- 23 Do you agree, that if a government funding contribution is appropriate, the structure of this contribution should be considered when re-estimating the gearing ratio?

8.4 Allowance for tax

As a State Owned Corporation, Essential Energy is liable to pay the NSW Government an equivalent amount to the tax that it, and its Essential Water business, would have paid to the Commonwealth Government if it was a privately owned business. We set a tax allowance in our building block framework to reflect the full efficient costs that a utility would incur if it were operating in a competitive market.

Essential Water has proposed a tax allowance of around \$1.7 million per year over the 2019 determination period (Table 8.6). It considers that its tax asset lives have been determined in accordance with relevant tax legislation, and has used a 30% corporate tax rate in calculating its tax allowance. It has not included any tax allowance for gifted assets (relating to the final section of the Broken Hill pipeline), or for the consequential works that it assumes will be funded by Government.

\$000s	2019-20	2020-21	2021-22	2022-23	Total
Water	-	-	340	387	727
Sewerage	234	231	265	282	1,011
Total	234	231	605	668	1,738

Table 8.6	Essential Water's	proposed total tax allowance 20)19-23 (\$2018-19)

Source: Essential Water pricing proposal to IPART, July 2018, Table 10-1, p 173.

We note that in March 2017, the Australian Government enacted legislation that introduced different rates of corporate income tax for businesses of different sizes. Under the legislation, from 1 July 2018, businesses with an aggregated turnover of less than \$50m (base rate entities) pay 27.5% tax, while those with a higher turnover pay 30% tax on all their taxable income.⁶³ From 2024-25, base rate entities will pay 27.0% tax, and this rate will reduce to 26.0% in the following year and 25.0% in 2026-27. Thresholds are not indexed for inflation.

The introduction of the company tax threshold raises two questions for IPART when estimating a regulated business's tax allowance:

- 1. Should we take the variable tax rates into consideration when modelling the tax allowance for regulated entities, and if so
- 2. What business unit level should we use to decide whether the business's turnover is above or below the threshold (ie, looking at the NRR of the whole of Essential Energy, or just Essential Water), and how should IPART account for the variable corporate tax rate in its tax allowance modelling?

Our preliminary views on these issues are:

- 1. We would take into consideration the variable corporate tax rates in calculating a business's tax allowance.
- 2. As a default, we would use the nominal NRR for the business unit level for which the WACC parameters are set, to estimate whether the business's turnover would be above or below the threshold.⁶⁴
- 3. Where the WACC parameters are not set for the whole business, we would consider on a case-by-case basis whether to use the whole of business nominal NRR to decide whether the business's turnover is above or below the threshold.

Once we decide what business unit NRR to use, our preliminary view is that we would model whether the business's NRR is above or below the threshold as follows:

- We would start by estimating the tax allowance using 30% as the default tax.
- We would then take the average of the nominal annual NRR estimates over the determination period.
 - If this average is greater than the threshold, we would apply the 30% tax rate in all years of the period.

⁶³ Treasury Laws Amendment (Enterprise Tax Plan) Act 2017.

⁶⁴ Due to circularities that using turnover as a comparator to the \$50m threshold would create in the building block framework, we propose to use a business's NRR as a proxy for turnover.

 Conversely, if the average is below the threshold, we would apply the 27.5% tax rate in all years of the period. In this case, we would recalculate the annual NRR estimates using the 27.5% tax rate.⁶⁵

In relation to which business unit level to use in this review, our preliminary view is that we should use the NRR for Essential Water only (rather than the NRR for Essential Energy as a whole). This is the component of the business being regulated by IPART, and the business level at which we propose the WACC parameters would be set.

IPART seeks comments on the following

- 24 Should we take the variable corporate tax rates into consideration in our review of Essential Water's tax allowance?
- 25 Should we use the same business unit level for determining the tax rate for Essential Water, as we do for determining the WACC, or are there reasons to move away from applying this approach?
- 26 Should we use 30% as the default tax rate and, if Essential Water's average Notional Revenue Requirement over the determination period is below the threshold, then use 27.5% to recalculate the tax allowance for the whole determination period?

⁶⁵ While we acknowledge businesses with turnover near the threshold may attract a different tax rate one year to the next, it is our preliminary view that this cannot be estimated in advance, and that a simple approach to assessing which tax rate to use will increase certainty in the modelling of Essential Water's NRR.

9 Forecast water sales and customer numbers

To calculate water and sewerage prices for the 2019 determination period, we will use forecasts of Essential Water's water sales, customer numbers and chargeable sewerage volumes over the this period. It is important that these forecasts are robust. If these forecasts are lower than actual sales, customers will pay too much. If they are higher than actual sales, Essential Water may not earn sufficient revenue to recover its efficient costs.

To decide on robust forecasts, we will consider Essential Water's proposed forecasts, compare them with WaterNSW's forecasts of water demand in the Broken Hill area, and conduct our own analysis. The sections below outline Essential Water and WaterNSW's proposed forecasts, and our preliminary analysis of Essential Water's proposal.

9.1 Essential Water's demand forecast

Essential Water forecasts that its treated water sales will decline by 0.4% per year and chlorinated water sales will decline by 0.6% per year over the 2019 determination period, and that its billable sewerage volumes will remain constant (see Table 9.1 for more detail).

In making these forecasts, Essential Water has assumed that:

- treated, untreated and chlorinated water sales to non-residential customers will remain constant
- demand for treated and untreated water from the existing mining companies will also remain constant, and
- no new mining customers will begin operating.⁶⁶

Box 9.1 provides more detail on the method Essential Water used to make its forecasts.

⁶⁶ Essential Water pricing proposal to IPART, July 2018, p 107.

Volume (ML)	2018-19	2019-20	2020-21	2021-22	2022-23
Total treated water	4,149	4,129	4,111	4,093	4,075
Total chlorinated water	42	42	42	42	41
Total untreated water	976	976	976	976	976
Total water sales	5,167	5,147	5,129	5,111	5,092
Billable sewerage volumes	555	555	555	555	555

 Table 9.1
 Essential Water's forecast water sales and billable sewerage volumes

Source: Essential Water pricing proposal to IPART, July 2018, Table 5-2, p 101.

Box 9.1 Essential Water's demand forecasting methodology

Essential Water used historical trends, as well as socio-demographic and climate information published by the Australian Bureau of Statistics (ABS) and the Australian Bureau of Meteorology (BOM).

Its method included seven steps:

- 1. Using 2016-17 data as a starting point for the forecasts (the most recent data available).
- 2. Forecasting customer numbers for 2017-18 and 2018-19 and cross-checking this with other relevant data, such as ABS data for population trends and new housing starts.
- 3. Forecasting customer numbers for 2019-23 and cross-checking this with other relevant information, including ABS data (as per step 2 above).
- 4. Forecasting rainfall and temperatures based on BOM climatic data and average climatic conditions.
- 5. Calculating a ratio of water usage per customer according to major customer categories and applying this to forecast customer numbers.
- 6. Identifying the potential impacts of price elasticity, but excluding these effects in the demand forecasts.^a
- 7. Cross-checking the forecasts for reasonableness against recent trends.

a For any subsequent demand modelling, Essential Water proposed we use the same price elasticity factors as applied in the 2016 Sydney Water Determination.

Source: Essential Water pricing proposal to IPART, July 2018, p 103.

Essential Water indicated that the main reason for its forecast decline in sales and customer numbers is the declining residential population in Broken Hill and surrounding communities. This population has consistently declined over the last few decades, and this has coincided with a gradual decline in water consumption (Figure 9.1).

Essential Water predicts that the population of Broken will decline by 1% per year over the 4-year regulatory period. Based on this trend, it expects customer numbers to also decline by 1% per year. Residential water consumption is forecast to decline by around 0.8% per year, with per capita consumption forecast to increase slightly over the next four years.⁶⁷

⁶⁷ Essential Water pricing proposal to IPART, July 2018, p 107.



Figure 9.1 Broken Hill's population and water usage over time

Source: Essential Water pricing proposal to IPART, July 2018; ABS, Census of Population and Housing, Australia, 2016.

9.2 Essential Water and WaterNSW's demand forecasts are inconsistent

As part of the WaterNSW pipeline price review that we are conducting concurrently to this review, WaterNSW has also prepared a forecast of water consumption by Essential Water's customers in its pricing proposal. Bulk water transportation costs to provide water to Essential Water account for the vast majority of these costs for WaterNSW.

We understand that the WaterNSW and Essential Water forecasts have both been prepared using historical consumption data produced by Essential Water.⁶⁸

Essential Water and Water NSW's demand forecasts should be consistent to ensure Essential Water's prices reflect underlying cost drivers as closely as possible. However, as Table 9.2 shows, the forecasts proposed by WaterNSW are 10-15% higher than those proposed by Essential Water. In addition, the trajectories of the usage forecasts are different, with WaterNSW's forecasts increasing and Essential Water's falling slightly.

 Table 9.2
 WaterNSW and Essential Water proposed water demand forecasts

Volume (ML)	2019-20	2020-21	2021-22	2022-23
WaterNSW forecast	5,635	5,687	5,757	5,786
Essential Water forecast	5,107	5,089	5,071	5,052

Note: WaterNSW forecast excludes offtake customers' demand and are net of any evaporative losses resulting from water being stored at the bulk water storage facility near Broken Hill; Essential Water forecast excludes estimate of Sunset Strip customers' demand (40ML/year).

Source: Essential Water pricing proposal to IPART, July 2018; WaterNSW pricing proposal to IPART, June 2018.

We seek feedback from the two utilities and other interested stakeholders to explain the differences in these two demand forecast profiles. We note that there may be some evaporative loss of water that is stored by WaterNSW before being used by Essential Water's

⁶⁸ WaterNSW pricing proposal to IPART, June 2018, p 71.

customers, and/or there will be some leakage from Essential Water's network. However, we consider these potential factors would not explain the different trajectory of usage forecasts.

IPART seeks comments on the following

27 Why are the demand forecasts prepared by WaterNSW and Essential Water different? Are these differences reasonable?

9.3 IPART's response to Essential Water's demand forecasts

We intend to produce a single water demand profile for Broken Hill's customers and use this when determining both Essential Water and WaterNSW's prices. This profile would be estimated on the same basis, and would provide consistency between the reviews and allow us to more accurately reflect bulk water costs in customer prices.

Our preliminary analysis of Essential Water's forecasts identified several issues that we will consider in producing our demand profile. These are that:

- recent water usage may not be good guide of future consumption
- customer numbers may fall more slowly than the population, and
- a change in water prices may impact water demand.

Recent water usage may not be a good guide of future consumption

We consider using 2016-17 consumption as the starting point for the forecasts may not be appropriate, as this consumption was affected by drought restrictions. Furthermore, the construction of the Broken Hill pipeline is expected to deliver a more stable source of water, which should be reflected in more stable (and potentially higher) demand.

Customer numbers may fall more closely than population

In the short run, we would expect residential usage to fall over time in line with the declining population, absent any shifts in average per capita consumption. However, customer numbers might be expected to fall more slowly than the overall population, because the average household size might be expected to fall as the population ages.

A change in water prices could impact water demand

Essential Water has not considered the impact of changes in water usage prices on the level of water demand (the elasticity of demand) in its usage forecasts. All else equal, an increase (decrease) in water usage prices should lead to lower (higher) consumption. In particular, if a large price increase could make prices unaffordable for customers, we would expect the elasticity of demand to influence estimated water demand.

In our 2016 Sydney Water review, we adopted an elasticity of -0.249 for residential customers, and -0.264 for non-residential customers. This elasticity implies that a 1% increase in usage prices would reduce the demand for water by 0.249% and 0.264% for residential and non-residential customers, respectively.

IPART seeks comments on the following

- 28 Are Essential Water's forecast sales volumes and customer numbers reasonable?
- 29 What factors should we consider in determining Broken Hill's future water demand?

10 Price structures and prices

Before we set Essential Water's maximum water and sewerage prices for the 2019 determination period, we will decide on the appropriate price structure for each service. Price structures determine how the customers' share of the total efficient cost of delivering the service is split between:

- different **types of customers** (for example, residential and non-residential customers), and
- different price components (that is, fixed service charges that are levied per meter or dwelling, and variable usage charges that are levied per kilolitre (kL) of water usage or sewerage discharge).

The sections below discuss the pricing principles and other considerations that we propose using to guide our decisions on price structures and maximum prices for Essential Water. They set out:

- Essential Water's proposed price structures for water services and sewerage services, and our preliminary response to the proposed price structures.
- Essential Water's proposal and our preliminary response for water prices and sewerage prices.
- Essential Water's proposal and our preliminary response for the prices of other services, including trade waste and miscellaneous services and recycled water.

10.1 Our pricing principles

In setting maximum prices for regulated water businesses our overarching principle is that prices should be cost-reflective. This means that:

- Prices should only recover sufficient revenue to cover the prudent and efficient costs of delivering the monopoly services. Prices for individual services should reflect the efficient costs of delivering the specific service.
- Price structures should match cost structures, whereby:
 - usage charges reference an appropriate estimate of marginal cost (ie, the additional cost of supplying an additional unit of water or sewerage services), and
 - fixed service charges recover the remaining costs.
- Customers imposing similar costs on the system pay similar prices.

Prices that are cost-reflective promote the efficient allocation and use of resources – such as water, and the capital invested to provide water supply services – by sending accurate signals to customers about the cost of services. For example, they discourage wasteful or unnecessary water usage.

Prices that are cost-reflective also promote efficient investment in water infrastructure and service provision – by ensuring that the regulated business cannot recover capital that is invested inefficiently or unwisely from the prices paid by customers.

However, as Chapter 3 discussed, given Essential Water's large proposed expenditures and small customer base, **setting prices that customers can afford will be a particularly important consideration in this review**. After we assess what prices customers can afford, we may decide that it is not appropriate for Essential Water's customers to fund the full efficient costs of delivering these services. In other words, prices may not be fully cost reflective.

Nevertheless, even if the total revenue from customers does not meet Essential Water's full efficient costs, we would seek to follow the principles of cost reflective pricing. To the extent possible, we propose to:

- Set prices for individual services to reflect the underlying cost drivers for delivering that service.
- Ensure price structures match cost structures, and in particular, that usage charges reflect the efficient marginal cost.
- Ensure customers imposing similar costs on the system pay similar prices.

In deciding on price structures, we also consider customers' preferences and whether:

- Any changes to the current price structures need to be phased in over a transition period to minimise impacts on customers.
- The resulting prices are transparent, and easy for customers to understand and for the business to administer.

IPART seeks comments on the following

30 Should we set maximum prices in line with the principles of cost-reflective pricing?

10.2 Essential Water's proposed price structures

Essential Water has proposed that the current price structures for water and sewerage services are maintained. These are 2-part price structures, comprising a fixed service charge and variable usage charge (see Table 10.1). For example, water prices consist of a fixed service charge (\$ per property) that reflects the cost of making water supply services available to the customer's premises, and a variable usage charge (\$ per kL) that reflects the cost associated with the customer's water consumption.

	Residential customers	Non-residential customers ^c
Water		
Usage	\$ per kL referencing short run marginal cost ^b	\$ per kL referencing short run marginal cost ^b
Service charges	Deemed all dwellings to have a 20mm meter and set a standard service charge on that basis	Meter-based charge on actual connection size (20mm meter equivalence)
Sewerage		
Usage charges ^a	(no explicit charge)	\$ per kL based on historical price structures
Service charges	Standard service charge for each dwelling based on historical price	Meter based charge (20mm meter equivalence)
structures ^c		The sewerage service charge faced by the end user is the service charge discounted by the relevant discharge factor.
		Service charges do not include a discharge allowance.

	Table 10.1	Current	price structures	for	Essential Water
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^a Sewerage usage is calculated based on metered water usage discounted by a discharge factor. Essential Water sets discharge factors

b We will assess the relationship between Essential Water's proposed price and our estimate of short run marginal cost.

^c Non-residential customers also have additional trade waste charges for discharges greater than domestic strength effluent. **Source:** Essential Water pricing proposal to IPART, July 2018, p 185.

Under Essential Water's proposal, the service and usage charges for both water and sewerage prices would increase by a uniform rate of 4.2% per year, in real terms. Essential Water considers that this would provide certainty over pricing arrangements to customers.

10.2.1 Proportion of fixed and variable charges

Under current pricing structures, service and usage charges each account for about half of residential water charges, on average. Essential Water has proposed to maintain the current proportion of fixed service charge and variable usage charges.

This is because Essential Water's customer survey results suggest that customers would prefer the current fixed/variable proportion of their bills to be maintained. About 70% of residential customers and 66% of business customers would like the current fixed/variable proportion of their water bills to be maintained. About 23% of residential customers and 30% of business customers said that if the proportion were to change, that they would prefer to increase the proportion of variable usage charges.

In addition, Essential Water considers that current price structures arrangements do not adversely affect efficient investment in water and sewerage services.

10.3 IPART's response to proposed price structures

Our preliminary view is that maintaining 2-part price structures for water and sewerage services is appropriate. However, we will investigate the proposed uniform price increases for water and sewerage services, and consider the proportion of fixed and variable charges.

10.3.1 Uniform price increases for water and sewerage may not be appropriate

Our preliminary analysis suggests that there may be drawbacks with increasing all components of water and sewerage prices by a uniform rate.

First, there is currently a cross-subsidy between sewerage and water services, whereby sewerage charges over-recover the costs of providing these services. In the 2014 determination, we restructured the water usage charge in response to stakeholder feedback. To implement this reform while minimising impacts on customer bills, we held sewerage charges constant in real terms (ie, without inflation), rather than allowing them to decrease in line with the decreased costs of providing sewerage services. As a result, sewerage charges recover more than the cost of the sewerage system.

Second, the underlying cost drivers for water, sewerage and other services are likely to increase at different rates in the 2019 determination period. This is because the expenditure Essential Water has proposed for this period (and the costs of transporting bulk water via the new Broken Hill pipeline and consequential works) will mean that the costs of these services increase at different rates.

Given that most of the costs of transporting bulk water and consequential works are necessary to supply water, it may be appropriate to apportion these costs to water charges.

At the same time, Essential Water has proposed \$34 million of capital expenditure to upgrade the Wills Street sewerage treatment plant. If the proposed water and sewerage expenditure is prudent and efficient, we will consider how we might be able to remove the cross-subsidy between sewerage and water service charges.

We seek feedback on whether to remove or reduce the cross-subsidy from sewerage to water service charges. If customers have a preference for stability in price structures,⁶⁹ it may be better to retain the over-recovery of the sewerage system in order to minimise any increase in water service prices.

10.3.2 Proportion of fixed and variable charges

In general, our view is that water prices should be structured to reflect costs, with:

- Variable usage charges (\$ per kL) set to reflect the cost associated with the customer's water consumption (also known as its marginal cost of supply). Setting usage prices at marginal cost should send appropriate signals regarding efficient water use (see Appendix D for further discussion).
- Fixed service charges (\$ per property, based on meter size) then be set to recover the remaining costs of providing water supply services to customers.

In practice, our principle that prices should be cost-reflective often needs to be balanced against practical and broader policy concerns, including broader social impacts. In particular,

⁶⁹ Essential Water's customer engagement did not ask specifically about the cross-subsidy between sewerage and water services.

there may be health benefits of customers in Broken Hill using water to reduce the impacts of lead dust pollution.⁷⁰

In this case, the social marginal benefit of this water usage may be greater than the private marginal benefit. In other words, society as a whole might derive a benefit from Broken Hill customers using water in this way, because it leads to healthier people, and healthier people can contribute more to society and impose less costs on society. If society benefits from customers' water usage, setting a lower usage price might be appropriate to promote the health benefits of customers in Broken Hill using water to reduce the impacts of lead dust pollution.

In the 2014 determination, we removed the inclining block tariff⁷¹ in response to stakeholder concerns that high water usage charges would have adverse impacts on community health and amenity.

We also note that a higher proportion of variable charges also means that customers have more control over their bills, where they can reduce bills by reducing their consumption. In other words, the higher the usage price, the stronger the incentive for customers to use less water.

All other things being equal, a decrease in usage prices would need to be offset by an increase in fixed service charges to allow Essential Water to recover its efficient costs. We will consider the proportion of fixed and variable charges when setting usage and service prices, taking into account customer preferences for stability.

IPART seeks comments on the following

- 31 Should we remove or reduce the cross-subsidy between water and sewerage service charges?
- 32 Should we maintain the current proportion of fixed and variable charges for water services?

10.4 Essential Water's proposed water prices

Essential Water's proposed water prices for the 2019 determination period are set out in \$2018-19 in Table 10.2. In summary, Essential Water has proposed to increase:

- service charges for residential and non-residential customers by an average of 4.2% per year (\$2018-19) over four years, and
- usage prices for treated, chlorinated, and untreated water by an average 4.2% per year (\$2018-19) over four years.

For mining customers, Essential Water has proposed that service charges be set individually, using the methodology that we established in our 2014 review. Mining customers would continue to pay the same usage charges as other customers for treated and untreated water.

⁷⁰ For example, the Government encourages Broken Hill residents to avoid dust, dirt and bare soil: http://leadsmart.nsw.gov.au/top-tips/

⁷¹ An inclining block tariff is a 2-tiered pricing approach where usage prices are split into a lower 'tier 1' price up to a specified threshold and a higher 'tier 2' price above this consumption threshold.

	2018-19	2019-20	2020-21	2021-22	2022-23	Change 2018-19 to 2022-23
Service Charges \$/pa						
Residential	328	342	356	371	387	18.1%
Non-residential ^a						
 20mm connection 	328	342	356	371	387	18.1%
 25mm connection 	512	534	556	580	605	18.1%
 40mm connection 	1,311	1,366	1,424	1,485	1,548	18.1%
- 50mm connection	2,048	2,135	2,225	2,320	2,418	18.1%
- 80mm connection	5,243	5,465	5,697	5,939	6,191	18.1%
 100mm connection 	8,192	8,540	8,902	9,280	9,673	18.1%
 150mm connection 	18,432	19,214	20,029	20,879	21,765	18.1%
Mines (\$ 000s)						
– Perilya	2,302	2,399	2,501	2,607	2,718	18.1%
– CBH	555	579	603	629	656	18.1%
Usage Charges \$/kL of water supplied						
Treated	1.80	1.88	1.96	2.04	2.13	18.1%
Chlorinated	1.16	1.21	1.26	1.31	1.37	18.1%
Untreated – Pipeline ^a	0.78	0.81	0.85	0.88	0.92	18.1%
Untreated – Non-pipeline	1.58	1.65	1.72	1.79	1.87	18.1%

 Table 10.2
 Essential Water's proposed residential, non-residential and mines water prices (\$2018-19 – ie, without inflation)

a: We understand pipeline customers currently receive untreated water from off-takes to the Menindee pipeline and Umberumberka pipeline for stock and domestic purposes.

Note: Meter based charge is based on 20mm meter. Applicable meter charge is set using the formula: (meter size)²x20mm meter charge/400. We have calculated service charges for larger meter sizes using this formula, based on Essential Water's stated 20mm price.

Source: Essential Water pricing model – based in \$2018-19. (Note that Essential Water's pricing proposal addendum, September 2018, is presented in nominal values.)

10.5 IPART's response to proposed water prices

We have identified four issues with Essential Water's proposed water prices:

- Should the water usage charge be set with reference to the long or short run marginal cost of supply?
- Should water prices take into account the underlying costs of serving different customer groups in different geographic areas within Essential Water's network?
- Should residential service charges differ for houses and apartments?
- Does our 2014 method for setting the mines water service charge remain appropriate?

10.5.1 Water usage charge and marginal cost of supply

In setting the water usage charge, we can use estimates of either the Long Run Marginal Cost of water supply (LRMC) or the Short Run Marginal Cost (SRMC):

- Using the LRMC has an advantage where augmentation of the water supply network is likely to be necessary in the foreseeable future. In this situation, an additional unit of water consumption contributes to the need for this future augmentation, and using LRMC signals the cost of this future augmentation and hence the cost of additional water consumption.
- However, where there is no foreseeable need for future supply augmentation, using SRMC may be more appropriate because it accurately reflects the cost of an additional unit of water consumption.

Essential Water supports using the LRMC to calculate the water usage charge. It considers that this sends better price signals about the costs of water consumption and provides greater pricing stability for customers. Based on a range of LRMC estimates for regulated water utilities around Australia⁷² and Essential Water's own estimates from the 2014 determination, it estimated that a plausible range for the LRMC of treated water is \$0.77 to \$3.03 per kilolitre. Essential Water did not recalculate its marginal costs from the 2014 determination because it considers that the LRMC of the water business would not have changed materially, and that its proposed treated water charge is within the plausible range (\$1.80 per kilolitre). It did not provide an estimate of the SRMC.

Our preliminary view is to have regard to the SRMC when setting water usage charges. In the Broken Hill area, water consumption has been declining in recent years. In addition, given the Broken Hill Pipeline and proposed consequential works will be operational in the 2019 determination period, no further large-scale augmentation of the water supply is foreseeable in the future.

Appendix D provides further discussion on marginal costs of supply.

We will also consider whether there are any reasons to deviate from SRMC when setting water usage charges. For example, in the 2014 determination, we decided to remove the inclining block tariff because it unnecessarily discourages water use.⁷³ This was in response to stakeholder concerns about the impact high water usage charges had on community health and amenity, because residents use water to manage lead dust pollution.⁷⁴

10.5.2 The costs of providing water may vary geographically

As Chapter 2 outlined, Essential Water has proposed expenditure to upgrade its existing water supply network and make significant changes to this network in response to the commissioning of the Broken Hill pipeline. We consider that some of this expenditure would be required to service certain customer groups only. For example:

⁷² Sydney Water, Hunter Water, Icon Water and Water Corporation (Western Australia).

⁷³ An inclining block tariff is a 2-tiered pricing approach where usage prices are split into a lower 'tier 1' price up to a specified threshold and a higher 'tier 2' price above this consumption threshold.

⁷⁴ For example, the Government encourages Broken Hill residents to avoid dust, dirt and bare soil: http://leadsmart.nsw.gov.au/top-tips/

- Expenditure to recommission water filters at the Mica Street Water treatment plant to remove blue-green algae and toxins from the raw water supply would service Broken Hill customers only.
- Expenditure on constructing a pipeline from the Stephen's Creek reservoir to replace the Menindee Lakes pipeline (which will be decommissioned) would service only the 11 graziers who currently have offtakes along the Menindee Lakes pipeline.
- Expenditure on replacing the pipeline to Sunset Strip from Menindee and modifying the off-take pumping station would only be required to service customers at Sunset Strip village and caravan park.

The costs of providing water to these customer groups are different. We consider that setting different prices for these customer groups would be consistent with our pricing principle that customers who impose similar costs on the system should pay similar prices.

It may be possible to set different water service and usage charges for different groups of customers, based on the underlying costs of servicing each group. For example, if we considered that the costs of constructing the pipeline from Stephen's Creek were efficient and affordable, the additional costs of constructing the pipeline from the Stephen's Creek reservoir would be borne by those who are supplied via that pipeline in the form of higher water prices.

We will investigate this issue further, and consider:

- the findings of our consultants and stakeholder views, and
- the costs and benefits of setting different prices for different customer groups, such as price signals, improved transparency, and the administrative costs and burden on Essential Water.

10.5.3 Residential service charges for houses and apartments

In the 2014 determination, we replaced meter based pricing with a standard residential service charge. A standard residential service charge means that each flat or apartment is charged as if it were a single house. Residential apartment blocks therefore are not charged according to the actual size of the meter connecting them to the network. Essential Water services only 453 apartments, which represent about 5% of its customers.⁷⁵

This change reflected Essential Water's charging practice until that time (ie, applying the standard 20mm residential service charge to all residential customers regardless of their meter size). This was because some residential customers require a larger meter size to ensure water pressure is adequate. Essential Water found that this was a cheaper alternative than to upgrade water mains.

Essential Water's pricing proposal is to maintain a standard residential service charge. The customer feedback it received suggests that 75% of customers believe service charges for houses and apartments should be the same.

Our preliminary view is that introducing different service charges may increase complexity with little corresponding benefit. This is because the pressure and flow issues outlined above

⁷⁵ Essential Water annual information return, July 2018.

⁴ IPART Review of Essential Energy's prices for water and sewerage services in Broken Hill

may apply equally to apartments and houses. As such, the meter size may not reflect the customer's water needs.

10.5.4 Method for setting the water service charge for mines

The 2014 determination was the first time we set cost-reflective prices for the mines. This meant that there was no subsidy between the mines and other customers. Our approach for setting prices for the mines was as follows:

- 1. We first determined the mines' share of Essential Water's water revenue, based on the mines' historical share of total water usage.
- 2. We then set prices for the mines to recover this revenue requirement, using the same methodology that we use to set other residential and non-residential prices.
 - The usage charge was set at the same price as for other customers.
 - The expected revenue from usage charges was calculated using forecast water sales.
 - The fixed service charges were set to recover the remainder of the mines' share of the revenue requirement.

This approach takes into account the assets used by the mines and other customers, and the maintenance costs associated with these assets.

Essential Water has proposed to maintain the current approach to mines pricing, because the proportion of water used by the mines in relation to total water used has not changed significantly. Essential Water also proposed to increases charges by the average increase each year as other services (ie, 4.2% in real terms).

If a new mine commences operations in the 2019 determination period, they would pay the same water usage charges as the existing mines and other customers. As an interim measure until the next price determination, the new mining customers would pay the meter-based water service charges applicable to non-residential customers.

However, our preliminary view is that we may have to adapt step two of our approach in this review. Since Essential Water's proposed revenue requirement does not include full costs, we would first need to determine the notional revenue requirement to recover full efficient costs. We would then set prices for the mines to recover their share of the revenue requirement. We will also consider what prices would be affordable for the mines (see section 3.4.3), because prices for the mines could rise substantially if they were to pay their full share of the revenue requirement.

IPART preliminary views

- 4 That we should have regard to Short Run Marginal Cost when setting the water usage charge.
- 5 That we should continue to charge houses and apartments the same water service charge.

IPART seeks comments on the following

33 Are Essential Water's proposed water service and usage prices reasonable?

- 34 When setting water usage charges, should we have regard to Short Run Marginal Cost or Long Run Marginal Cost?
- 35 Should we set different water prices for different customer groups, based on the underlying costs of servicing these customers?
- 36 Should we set different residential service charges for apartments and houses?
- 37 Should we maintain our current pricing approach for the mines?
- 38 How should we treat new mining customers, should they eventuate?

10.6 Essential Water's proposed sewerage prices

Essential Water's proposed sewerage prices for the 2019 determination period are set out in \$2018-19 in Table 10.3. In summary, it has proposed to:

- increase sewerage service charges for all residential and non-residential customers by an average of 4.2% per year over four years, and
- increase sewerage usage charges for non-residential customers at an average of 4.2% per year over four years.

	2018-19	2019-20	2020-21	2021-22	2022-23	Change 2018-19 to 2022-23
Service Charges \$/pa						
Residential	536	558	582	607	633	18.1%
Non-residential ^a						
 20mm connection 	765	798	832	867	904	18.1%
 25mm connection 	1,195	1,246	1,299	1,354	1,412	18.1%
 40mm connection 	3,060	3,191	3,326	3,468	3,615	18.1%
– 50mm connection	4,781	4,986	5,197	5,418	5,648	18.1%
 80mm connection 	12,240	12,764	13,305	13,870	14,459	18.1%
 100mm connection 	19,125	19,944	20,790	21,672	22,591	18.1%
 150mm connection 	43,031	44,873	46,777	48,762	50,831	18.1%
Usage Charges \$/kL of water supplied						
Non-residential	1.28	1.33	1.39	1.45	1.51	18.1%

Table 10.3 Essential Water's proposed sewerage prices (\$2018-19 – ie, without inflation)

a Non-residential prices assume a 100% discharge factor, bills will depend on discharge factors for individual customers.
 Note: Sewerage service charges for non-residential customers and mining customers are based on water meter size. The applicable meter charge is set using the formula:

- (meter size)²x20mm meter charge/400.

We have calculated service charges for larger meter sizes using this formula, based on Essential Water's stated 20mm price. **Source:** Essential Water pricing model (based in \$2018-19); IPART Analysis. (Note that Essential Water's pricing proposal addendum, September 2018, is presented in nominal values.)

10.7 IPART's response to proposed sewerage prices

One issue we have identified is that, under Essential Water's proposal, **non-residential customers with equivalent use to a residential customer pay more for sewerage services than their residential counterparts**. As is currently the case, Essential Water has proposed that:

- Residential customers pay only a sewerage service charge and no usage charge.
- Non-residential customers pay both service and usage charges, and the service charge does not include a discharge allowance (which would otherwise be the volume above which sewerage usage charges apply).

Our preliminary analysis indicates that in 2018-19, a residential customer who discharged 90kL (the reported annual average discharge for residential customers)⁷⁶ paid a sewerage service charge of \$536. However, a non-residential customer on a 20mm meter with discharge factor of 70%⁷⁷ who also discharged 90kL paid a service charge of \$536, **plus** sewerage usage charges of \$115.78 In total, this non-residential customer paid a sewerage bill of \$651 per year.

In line with our pricing principles, we consider that customers who impose similar costs on the system should pay similar prices. To make residential and non-residential sewerage charges more comparable, we could recalculate sewerage service charges to include a deemed usage of 90kL per annum. This would also mean that non-residential sewerage usage charges would only apply to estimated discharge volumes greater than 90kL per annum (see Appendix D).

Essential Water analysis (see Figure 10.1) suggests that applying a deemed wastewater allowance of 90kL per annum (ie, where all service charges include a deemed wastewater usage of 90kL) would result in an increase of \$10 (\$2018-19) for residential customers, while non-residential customers would see a decrease in their bills. For example, a non-residential customer dispersing 90kL of wastewater would see a decrease of \$105.

⁷⁶ Essential Water pricing proposal to IPART, July 2018, p 191.

A discharge factor is an estimate of the percentage of incoming water to a property that is discharged to the sewerage network. It is estimated by Essential Water. According to Essential Water, the NSW Government's *Guidelines for Best Practice Management of Water Supply and Sewerage* specify that the charge for a non-residential customer who discharges 70% of the water it purchases into the sewerage system should equate to the charge for a residential customer (Essential Water proposal to IPART, September 2013, p 57.)

⁷⁸ Essential Water pricing proposal to IPART, July 2018, p 191.



Figure 10.1 Essential Water sewerage bill comparison with tariff reform



Essential Water does not support a change in current sewerage price structures. According to customer feedback it received, 55% of residential customers would not be prepared to pay \$10 to reduce the price differential between residential and non-residential customers.

However, given the potential equity and efficiency concerns with current price structures, our preliminary view is that we should investigate ways to address the differential between residential and non-residential customers to make these prices more cost reflective.

IPART preliminary view

6 That we should remove or reduce the sewerage bill differential between non-residential and residential customers.

IPART seeks comments on the following

- 39 Are Essential Water's proposed sewerage service and usage prices reasonable?
- 40 Should residential customers pay more for sewerage services so that they pay similar prices to non-residential customers with equivalent use?

10.8 Essential Water's prices for trade waste and miscellaneous services

Trade waste and miscellaneous charges contribute only a small part of Essential Water's revenue. Essential Water has proposed to increase:

- trade waste charges by the change in its total annual revenue requirement over the determination period (ie, about 4.2% per year without inflation), and
- miscellaneous charges by inflation (ie, consumer price index).

However, we have identified two issues regarding Essential Water's proposed charges for these services:

- Our preliminary position is that the costs of providing trade waste and miscellaneous services should reflect underlying increases in the costs of providing these services.
- Essential Water's pricing proposal does not include the full costs of providing trade waste services to all of these customers, which could result in other customers effectively paying these costs.

Essential Water's pricing proposal forecasts about \$2,000 a year in trade waste revenue over the determination period. Essential Water has reported to us that this only includes trade waste revenue from two mining customers.⁷⁹ While Essential Water provides trade waste service to other non-residential customers, it does not appear to recover these costs.

Our 2014 determination set maximum prices for trade waste for all trade waste customers, not just mining customers. We subtracted the full amount of the notional trade waste revenue (ie, for all trade waste customers) from the revenue requirement prior to setting water and sewerage prices, even though Essential Water did not subsequently recover the full amount. This is so that customers who do not use trade waste services do not subsidise customers who do use trade waste services. Our preliminary position in this review is to apply the same approach we used in our 2014 determination.

IPART preliminary view

7 That we should set trade waste and miscellaneous prices by the change in the underlying costs of providing these services.

IPART seeks comments on the following

41 Are Essential Water's proposed increase in prices for trade waste and miscellaneous services reasonable?

10.9 Essential Water's recycled water prices

Essential Water currently supplies recycled water to eight customers, by treating water collected from its sewer reticulation network.

The 2010 determination set effluent water prices at \$0.62 per kL (\$2013-14), but in our 2014 determination we did not set a price for this service. At the time of the 2014 price review, Essential Water was charging \$0.17 per kL (\$2013-14) plus a fixed service charge negotiated with the customers.⁸⁰

In our 2014 determination, to reflect Essential Water's charging practice at that time, we decided to treat effluent water as an unregulated income source, and share this income equally between Essential Water and its customers. Essential Water had already established contracts with its customers for the supply of effluent. By not setting a price, we allowed Essential Water to continue its practice. We considered that effluent water was not a monopoly service.

Essential Water has proposed to continue the current practice of treating effluent water as an unregulated income, with revenue shared 50:50 between Essential Water and customers.

⁷⁹ Essential Water email correspondence to IPART, 16 August 2018.

⁸⁰ IPART, Essential Energy's water and sewerage services in Broken Hill, Review of prices from 1 July 2014 to 30 June 2018 - Final Report, June 2014, p 99.

We are conducting a full review of our approach to regulating recycled water prices of water utilities concurrent to this review. Our review of pricing arrangements for recycled water services will cover all metropolitan water utilities we regulate, including Essential Water. Our view is that our recycled water pricing review is the most appropriate forum to reconsider our approach to recycled water pricing and ensure we address any stakeholder concerns.

Therefore, our preliminary position is not to set maximum recycled water prices for Essential Water as part of this price review. Rather, we would seek to apply the outcomes of our 2018-19 recycled water pricing review at the next review of the Essential Water's prices. However, we will consider stakeholders' views before deciding whether to set recycled water prices in this review.

IPART seeks comments on the following

42 Should we set maximum prices for Essential Water's recycled water services now, as part of this review? If so, why?

Appendices

A Matters to be considered by IPART under Section 15 of the IPART Act

In making determinations, IPART is required, under Section 15 of the IPART Act, to have regard to the following matters (in addition to any other matters IPART considers relevant):

- a) the cost of providing the services concerned
- b) the protection of consumers from abuses of monopoly power in terms of prices, pricing policies and standard of services
- c) the appropriate rate of return on public sector assets, including appropriate payment of dividends to the Government for the benefit of the people of New South Wales
- d) the effect on general price inflation over the medium term
- e) the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers
- f) the need to maintain ecologically sustainable development (within the meaning of section 6 of the *Protection of the Environment Administration Act 1991*) by appropriate pricing policies that take account of all the feasible options available to protect the environment
- g) the impact on pricing policies of borrowing, capital and dividend requirements of the government agency concerned and, in particular, the impact of any need to renew or increase relevant assets
- h) the impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body
- i) the need to promote competition in the supply of the services concerned
- j) considerations of demand management (including levels of demand) and least cost planning
- k) the social impact of the determinations and recommendations
- 1) standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).
B Essential Water's regulatory framework

A number of regulators oversee Essential Water's water and sewerage functions. Essential Water's primary regulators include:

- IPART, which is responsible for setting the maximum prices charged by Essential Water for its monopoly services.
- The **Department of Industry Water** (DoI Water) which:
 - Administers ministerial approval to construct, extend or modify works for water and sewage treatment, and for reusing effluent and biosolids under the *Water Management Act* 2000.⁸¹ This approval process aims to provide assurance that the infrastructure is fit for purpose; protects public health and safety, and the environment; and provides a robust, cost-effective solution that meets community needs.⁸²
 - Oversees the performance of Local Water Utilities based on the requirements of the NSW Best-Practice Management of Water Supply and Sewerage Guidelines.⁸³
 - Publishes the annual *NSW Water Supply and Sewerage Performance Monitoring Report,* which benchmarks of the performance of all NSW water utilities.
- The Dams Safety Committee, which is responsible (under the Dams Safety Act 1978) for formulating measures to ensure the safety of dams and maintaining surveillance of prescribed dams, including those under the management of Essential Water. Under the Mining Act 1992, the Dams Safety Committee has statutory functions, through advice to the responsible Minister, in determining the type and extent of mining allowed near dams and their storages.
- **NSW Health**, which is responsible for regulating the quality and safety of Essential Water's drinking water, consistent with the *Australian Drinking Water Guidelines* 2011.
- The NSW Environment Protection Authority (EPA), which is responsible for licencing and monitoring sewage discharges from Essential Water's sewerage system under the *Protection of the Environment Operations Act* 1997.
- The Natural Resource Access Regulator (NRAR), which is responsible for compliance and enforcement of natural resources management legislation. Its functions are conducted under the *Natural Resources Access Regulator Act 2017*. Essential Water's water licence limits its extraction of water from surface and groundwater sources under the *Water Management Act 2000* and the *Water Act 1912*.

⁸¹ See section 292 of *Water Management Act 2000* (and clause 116 of the *Water Management General Regulation 2011*).

⁸² Dol Water has a role in approving medium and high risk liquid trade waste applications, and approving local council water utility policy for liquid trade waste regulation. It performs these roles to address the potential risks to public health and safety and the environment (see clause 142 of the *Water Management General Regulation 2011*.)

⁸³ NSW Government, *Guidelines for Best Practice Management of Water Supply and Sewerage*, August 2007.

C Essential Water's proposed cost pass-through events

The	table	below	summarises	Essential	Water's	proposed	cost	pass-through	events	and
trigg	gers.									

Pass-through event	Purpose	Summary of trigger criteria	Effect
A regulatory change event	To address revenue gained or lost through a change in the regulatory, legal or tax environment. Based on similar provisions in the AER regulatory framework.	 During the regulatory period, a material increase or decrease in the cost of Essential Water providing a regulated service due to: a change in a regulation or requirement; or an administrative act or decision: substantially varying the manner Essential Water is required to provide a regulated service imposing, removing or varying minimum service standards applicable to regulated water or wastewater services the nature or scope of regulated water or wastewater services provided by Essential Water; or an imposition or removal of a relevant tax or change in the rate of a tax, the way it is officially interpreted or how it is collected. 	Essential Water would be able to pass on the costs of this change above a materiality threshold of 2.5% of the yearly revenue requirement or would be required to refund savings below a 2.5% threshold.
A drought relief event	To recover costs for government directed drought relief measures	 During the 2019-23 regulatory period, Essential Water is directed by government to ensure availability of water supply to customers in the Broken Hill region by: undertaking capital investment; and/or undertaking maintenance activities and the costs of this direction: causes Essential Water to incur costs beyond any drought relief allowances made by IPART in the determination; and these costs, net of any allowances, materially increase the cost of providing regulated services. 	Essential Water would be able to pass on the costs of this change above a materiality threshold of 2.5% of the yearly revenue requirement or would be required to refund savings below a 2.5% threshold
A Murray River to Broken Hill Pipeline event	To pass through unanticipated costs associated with the Murray River to Broken Hill pipeline to customers	 During the 2019-23 regulatory period: the costs associated with the Wentworth to Broken Hill pipeline as incurred by WaterNSW and passed through to Essential Water are materially higher than those allowed by IPART through this determination; 	Essential Water would be able to pass on the costs of this change above a materiality threshold of 2.5% of the yearly revenue requirement or would be required to refund savings below a 2.5% threshold

		 the costs incurred by Essential Water to provide a safe and reliable water supply to the customers are materially higher than those provided for by IPART in the Essential Water determination. This includes, but is not limited to, the costs incurred by Essential Water related to the operation of the pipeline; Essential Water is required by Government to undertake capital investment or operating activities to ensure availability of water supply to customers in the Broken Hill region as a result of major outages or design limitations associated with the pipeline, or the costs beyond the allowances contained in the 2019-23 IPART determination (if any) materially increase the costs to Essential Water in providing regulated services. 	
A consequential works event	To pass through costs for Essential Water's proposed consequential works to customers if they are unable to secure alternative funding	 If Essential Water does not receive government funding for the consequential works; and in Essential Water's "reasonable assessment", the works are required to ensure the availability of water supply to customers and to maintain service standards in the Broken Hill region; Essential Water has attempted to and been unsuccessful in finding finance. 	There is no materiality constraint in the wording of the criteria.

Source: Essential Water pricing proposal to IPART, July 2018, p 211-212.

D Marginal cost of water supply

In economics, the term 'marginal cost' is used to describe the increase in a firm's total costs arising from the production of one more unit of output. In this review, the marginal cost of water supply is the additional cost to Essential Water of providing an additional unit of water to customers.

The marginal cost of supply is generally accepted as the efficient way to set usage charges, because they correctly reflect the cost of water usage. Fixed charges are then set to recover the difference between total efficient costs and the revenue from usage charges.

Short run marginal cost or long run marginal cost?

The difference between short run marginal cost (SRMC) and long run marginal cost (LRMC) is the time frame under consideration. SRMC takes capacity as given, and so relates only to changes in costs to deliver an additional unit of water to customers **given existing capacity**. LRMC involves a change in the utility's operations to meet customer demand, such as a capital investment to increase capacity. In economics, the long run is the time horizon where both capital and labour costs are variable, whereas in the short run labour costs are variable and capital costs are fixed.

Essential Water has proposed to use long run marginal cost as the basis for setting water usage prices. It argue sthat including the cost of increasing physical capacity is an important price-setting signal even if augmentation is unlikely.

Our view is that where there is likely to be a supply capacity constraint in the foreseeable future, and therefore a potential need to invest in water supply augmentation and/or demand management measures, water usage prices should be set at the LRMC. This signals the incremental cost of new supply augmentation and/or demand management measures to bring the demand and supply of water into balance over the longer term.

For metropolitan water utilities that we regulate, our practice has been to set usage prices with reference to LRMC. These utilities service growing populations and have been faced with the prospect of capacity constraints, and therefore the need for supply augmentation, in the foreseeable future. We consider, however, that there is no long term water supply/demand imbalance in Broken Hill for the foreseeable future. Broken Hill's population, and water consumption, is declining (see Chapter 9 for more details). Furthermore, the new Broken Hill pipeline will provide up to 37.4 ML/day, which is roughly 140% of Broken Hill's peak water demand.⁸⁴ No augmentation of water supplies is required in Broken Hill for the foreseeable future.

For this reason, we consider that Essential Water's LRMC of water supply effectively equals its SRMC. That is, the water usage price should be set with reference to the SRMC, or simply the marginal cost of supply.

⁸⁴ Essential Water annual information return, July 2018.

Estimates of Essential Water's marginal cost of water supply

In the 2014 determination, we estimated that the weighted average marginal cost of treated water supply across all weather conditions is about \$1.31 per kL in \$2013-14 (or \$1.41 per kL in \$2018-19). The price currently charged for water usage is \$1.80 per kL (\$2018-19).

Essential Water has not recalculated its marginal cost of supply since the 2014 determination. It considers that the LRMC of the water business would not have changed significantly since 2014 and the \$1.80 per kL charge remains representative.

However, given the significant changes to its water operations due to the Broken Hill pipeline, we consider it is worth recalculating Essential Water's marginal cost of supply. For example, the variable costs of operating the Menindee pipeline will no longer be incurred, since it will be decommissioned.

We propose to calculate Essential Water's marginal cost of supply from the following components:

- 1. the usage component of bulk water from WaterNSW
- 2. the energy costs for pumping water from the WaterNSW Broken Hill pipeline plus the existing supply network,
- 3. the cost of chemicals and water treatment, and
- 4. maintenance and replacement costs for pumps and any other moving parts from the WaterNSW Broken Hill pipeline and Essential Water's network.

The cost of component 1 was determined as part of the 2017 review of WaterNSW rural bulk water services.

For components 2 and 4 related to the Broken Hill pipeline, we have engaged expert consultants to review WaterNSW's proposal on energy costs and recommend efficient benchmark prices per unit of energy. For the costs of 2, 3 and 4 related to Essential Water's network, we have engaged consultants to review Essential Water's proposed costs for its existing water supply network.

Marginal cost of sewerage supply

Essential Water did not provide any estimates of the marginal cost of sewerage supply. It has proposed to increase the current sewerage usage charge of \$1.28 per kL (paid by non-residential customers only) by the average change in prices in each year of the regulatory period.

We are considering whether to change the price structure for sewerage prices so that nonresidential customers with equivalent use do not pay more than residential customers. This could potentially be achieved by:

 adding a discharge allowance or deemed usage amount (eg, 90kL multiplied by the usage charge) to each residential and non-residential base level service charge (after the service charge has been scaled-up, in the case of non-residential meters greater than 20mm meter equivalent), and then only applying the non-residential sewerage usage charge to estimated discharges greater than this discharge allowance or deemed level of usage (eg, the usage charge is only applied to discharges greater than 90kL per annum).

In setting usage charges, we will need to consider the marginal cost of sewerage supply. We could estimate the marginal cost based on the following components:

- 1. the energy costs for pumping
- 2. the cost of treatment, and
- 3. maintenance and replacement costs for pumps and any other moving parts.

We would also consider whether other operating costs, such as fleet and hire services, contribute to the marginal costs of water or sewerage supply.

E Glossary

2014 Determination period	The period set by IPART from 1 July 2014 to 30 June 2018
2019 Determination period	The period to be set by IPART, from 1 July 2019 up to five years
Annual revenue requirement	The notional revenue requirement in each year of the determination period
Broken Hill Pipeline	The WaterNSW Murray River to Broken Hill pipeline
Bulk water	Water delivered by WaterNSW to irrigators and other licence holders on regulated rivers across NSW
CPI	Consumer Price Index
Discharge factor	Percentage of incoming water to a property that is discharged to the sewerage network
ECM	Efficiency carryover mechanism
GL	Gigalitre (one billion litres)
IPART	Independent Pricing and Regulatory Tribunal of NSW
IPART Act	Independent Pricing and Regulatory Tribunal Act 1992 (NSW)
kL	Kilolitre
LRMC	Long run marginal cost
ML	Megalitre (one million litres)
NRR	Notional revenue requirement. Revenue requirement set by IPART that represent the efficient costs of providing Essential Water's monopoly services
NPV	Net Present Value

RAB	Regulatory asset base
RO plant	Reverse osmosis plant
Section 16A direction	Ministerial direction pursuant to section 16A of the IPART Act
Section 20P directions	Ministerial directions pursuant to section 20P of the SOC Act
SOC Act	State Owned Corporations Act 1989 (NSW)
SRMC	Short run marginal cost
Target revenue	The revenue Essential Water generates from maximum prices set by IPART
WACC	Weighted average cost of capital