IPART

Independent Pricing and Regulatory Tribunal
New South Wales

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

**From 1 July 2019**

**Draft Report**
**Water Pricing**

**April 2019**

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# 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 24 April 2019**

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
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If you would like further information on making a submission, IPART's submission policy is available on our website.

# Contents

# 1 Executive Summary

The Independent Pricing and Regulatory Tribunal of NSW (IPART) is reviewing the prices for Essential Water's[1] water and other services to customers in Broken Hill and the surrounding areas of Menindee, Sunset Strip and Silverton. We will determine the maximum prices it can charge from 1 July 2019 for its:

- Water supply services
- Sewerage services
- Trade waste services, and
- A range of its miscellaneous and ancillary services.[2]

In the concurrent WaterNSW pipeline review, we are reviewing the prices WaterNSW can charge Essential Water for the water transportation services provided by the Murray River to Broken Hill Pipeline (the Pipeline) from 1 July 2019.[3]

In this report, we outline our draft decisions on Essential Water's efficient costs of providing water and other services, the share of costs (including Pipeline costs) that would be recovered from customers through our draft prices, and our recommended share of costs to be funded by the NSW Government. It also explains how we reached these draft decisions and how our draft prices compare to Essential Water's proposed prices. We have set draft prices taking into account the NSW Government's commitment that prices would not increase in real terms as result of the Pipeline. Bills for most residential customers would increase by less than inflation.

We invite submissions from all interested parties, and will consider these submissions before making our final decisions in late-May 2019. The new charges are expected to apply from 1 July 2019.

**Submissions to this Draft Report are due by 24 April 2019.**

Throughout this report, our draft prices are presented in $2018-19, unless stated otherwise. This means these draft prices, and the difference between them and current (2018-19) prices are expressed in real terms (that is, excluding the impact of inflation).

1 Essential Water is Essential Energy's water and sewerage business.
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 10.4).
3 IPART, Review of prices for WaterNSW Murray River to Broken Hill Pipeline from 1 July 2019 – Draft Report, April 2019.

## 1.1 Overview of draft decisions and their impacts

We have made a draft decision to set prices for three years, from 1 July 2019 to 30 June 2022 (2019 determination period).[4] Under our draft decisions:

- Prices for water and sewerage services would remain broadly constant for most residential customers and decrease for most non-residential customers. This means that bills for most residential customers would increase by less than inflation and remain broadly similar for most non-residential customers. The main exceptions are:
  - Chlorinated water and untreated water pipeline customers,[5] whose water usage prices, and water bills would increase by more than inflation to better reflect Essential Water's costs in supplying these services.
  - Mining customers, who would face an increase in water service prices and bills, because their historical share of water usage also increased.
- The structure of sewerage service prices for residential customers would change to improve equity and cost reflectivity between residential and non-residential customers.
- Essential Water would generate about 3% less revenue per year than it proposed (on average), to maintain its existing network.

Our draft pricing decisions mean that we recommend a NSW Government subsidy of $26 million per year on average (or $78 million in total) over the 2019 determination period. This is to reflect the NSW Government's commitment to subsidise the full efficient costs of the Pipeline such that prices for end use customers do not rise in real terms as a result of the Pipeline (see Section 1.1.6).

### 1.1.1 Most prices would remain broadly constant

Essential Water proposed that all water prices increase by an average of 4.2% per year (in real terms). However, under our draft decisions:

- Water service prices for residential and non-residential customers and treated water usage prices would remain broadly the same in real terms over the determination period.
- Chlorinated water usage prices would gradually increase towards untreated water usage prices, to make them more cost-reflective.
- The untreated water usage price levied on offtake customers who receive water directly from the Menindee and Umberumberka pipelines (currently $0.78 per kL) would increase to match the price for other untreated water customers ($1.58 per kL), to better reflect the cost of supplying untreated water to these customers.
- Water service prices for mining customers would increase, reflecting their higher historical share of water usage.

4 We last set maximum prices for Essential Water in 2014 from 1 July 2014 to 30 June 2018 (the 2014 determination period). These prices continue to 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 were clearer. For more information, see: IPART, Broken Hill Water and sewerage services price review deferred, Media Release, 14 November 2016.

5 Offtake customers who receive untreated water directly from the Menindee and Umberumberka pipelines.

- Sewerage service prices would decrease by 24% for non-residential customers (and 3% for residential customers). The relative difference is because we have introduced a deemed sewerage usage component for residential customers.[6] We have made this price structure change to promote more equitable and cost-reflective prices between residential and non-residential customers (see Chapter 9).

In addition, we have set simpler fixed and variable charges for trade waste, to encourage Essential Water to recover trade waste costs from customers who impose these costs, rather than from all customers. Although our 2014 Determination set prices for trade waste, Essential Water did not levy these charges on customers in practice (except for the mines). We consider that Essential Water should levy trade waste charges on all trade waste customers in the 2019 determination period, and consult customers to better understand the impacts of these charges on them and inform its proposed trade waste prices at the next price review.

Our draft water and sewerage prices are set out on Table 1.1 and Table 1.2, respectively.

**Table 1.1 IPART's draft water prices ($2018-19 – ie, without inflation)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Service Charges ($/year)** | | | | | |
| Residential | 327.68 | 327.68 | 327.68 | 327.68 | 0.0% |
| Non-residential[a] | | | | | |
| – 20mm connection | 327.68 | 327.68 | 327.68 | 327.68 | 0.0% |
| – 25mm connection | 512.00 | 512.00 | 512.00 | 512.00 | 0.0% |
| – 40mm connection | 1,310.72 | 1,310.72 | 1,310.72 | 1,310.72 | 0.0% |
| – 100mm connection | 8,192.01 | 8,192.00 | 8,192.00 | 8,192.00 | 0.0% |
| Mines ($ 000s) | | | | | |
| – Perilya | 2301.55 | 2,762.49 | 2,762.49 | 2,762.49 | 20% |
| – CBH | 555.17 | 663.21 | 663.21 | 663.21 | 19% |
| **Usage Charges ($/kL)** | | | | | |
| Treated | 1.80 | 1.80 | 1.80 | 1.80 | 0% |
| Chlorinated | 1.16 | 1.22 | 1.28 | 1.34 | 16% |
| Untreated – Pipeline[b] | 0.78 | 1.58 | 1.58 | 1.58 | 103% |
| Untreated – Non-pipeline | 1.58 | 1.58 | 1.58 | 1.58 | 0% |

**a** The meter based charges are set with reference to the 20mm meter charge based on the following formula: (meter size)$^2$x20mm meter charge/400.

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

6 Residential customers would pay a fixed (or deemed) sewerage usage charge of 90 kL year annum multiplied by the sewerage usage charge. Non-residential would continue to pay a sewerage usage charge based on water usage multiplied by their discharge factor, multiplied by the sewerage usage price.

**Table 1.2 IPART's draft sewerage prices ($2018-19– ie, without inflation)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Service Charges ($/year)** | | | | | |
| Residential[a] | 535.73 | 522.01 | 522.01 | 522.01 | -3% |
| Non-residential[b] | | | | | |
| – 20mm connection | 765.00 | 581.16 | 581.16 | 581.16 | -24% |
| – 25mm connection | 1,195.22 | 908.06 | 908.06 | 908.06 | -24% |
| – 40mm connection | 3,060.01 | 2,324.62 | 2,324.62 | 2,324.62 | -24% |
| – 100mm connection | 19,125.08 | 14,528.89 | 14,528.89 | 14,528.89 | -24% |
| **Usage Charges ($/kL)** | | | | | |
| Non-residential | 1.28 | 1.28 | 1.28 | 1.28 | 0% |

**a** We have made a draft decision to introduce a deemed sewerage discharge allowance of 90 kL per annum for residential customers (see Section 9.4). This deemed sewerage usage charge has been included in the residential service charge, although it is up to Essential Water whether it bills customers the deemed sewerage discharge allowance as a separate usage charge, or within the residential service charge.

**b** Non-residential prices assume a 100% discharge factor. Bills would 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)$^2$x20mm meter charge/400xdischarge factor. We have calculated service charges for larger meter sizes using this formula.

### 1.1.2 Bills would increase by slightly less than inflation for most residential customers

Under our draft prices for residential customers, most customers would see a small increase in their combined water and sewerage bills over the determination period, including the effects of inflation.[7] While actual bill impacts would depend on customers' individual water usage, we have estimated indicative impacts for customers with a range of usage (Table 1.3). This analysis indicates that, over three years (to 2021-22):

- A customer in a house or apartment who uses 200 kL of treated water per year would see an increase in their annual bill of around 6% (in nominal terms)
- A pensioner customer in a house or apartment who uses 200 kL of treated water per year would see an increase in their annual bill of around 7% (in nominal terms).[8]

7 Our estimate of inflation is based on forecast inflation of 1.7% for 2019-20 and then 2.5% per year thereafter. This results in a cumulative expected inflation of 6.8% over the 3 years.

8 Pensioners would see their bills increase slightly more compared with other residential customers. This is because the pensioner rebate of $175 per year (for water and sewerage) is fixed in nominal terms and not indexed in line with inflation. The rebate is provided by Essential Water and funded by the NSW Government.

**Table 1.3 Residential annual water and sewerage bills under draft prices ($nominal)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Residential – treated water – non pensioner** | | | | | |
| 200kL | 1,223 | 1,230 | 1,261 | 1,292 | 6% |
| 300kL | 1,403 | 1,413 | 1,448 | 1,485 | 6% |
| 400kL | 1,583 | 1,596 | 1,636 | 1,677 | 6% |
| **Residential – treated water – pensioner** | | | | | |
| 200kL | 1,048 | 1,055 | 1,086 | 1,117 | 7% |
| 300kL | 1,228 | 1,238 | 1,273 | 1,310 | 7% |
| 400kL | 1,408 | 1,421 | 1,461 | 1,502 | 7% |
| **Residential – chlorinated water (water bills only as no sewerage services are provided)** | | | | | |
| 200kL | 560 | 581 | 608 | 636 | 14% |
| 300kL | 676 | 705 | 741 | 779 | 15% |
| 400kL | 792 | 829 | 875 | 922 | 16% |

**Note:** Bills are calculated assuming individual 20mm meter connections. Bill impacts include our estimate of cumulative inflation of 6.8% over the 2019 determination period.

**Source:** Essential Water pricing model, September 2018 (based in $2018-19); IPART analysis.

### 1.1.3 Bills would remain broadly similar for most non-residential customers

For non-residential customers, the impacts of our draft decisions on bills would depend on their meter size, discharge factor, and water usage. Our estimates of the indicative bill impacts on businesses with a range of meter sizes and levels of water usage indicate that most customers would see a small bill increase that is below the rate of inflation (Table 1.4) – largely due to the decrease in sewerage service prices.[9] For example, a non-residential customer consuming 2,100 kL of treated water per year would see a bill increase of 1% (in nominal terms) in 2021-22 compared to 2018-19.

For some non-residential customers, total bills would increase more if they also pay trade waste charges (see Chapter 10 for further details).

9 Bill impacts would otherwise be higher for businesses, including inflation, if sewerage prices did not decrease.

**Table 1.4 Non-residential annual water and sewerage bills under draft prices ($nominal)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Non-residential – treated water** | | | | | |
| 20mm with 250kL usage | 1,537 | 1,432 | 1,468 | 1,505 | -2% |
| 25mm with 1,000kL usage | 4,045 | 3,907 | 4,007 | 4,105 | 1% |
| 40mm with 2,100kL usage | 9,114 | 8,742 | 8,966 | 9,185 | 1% |
| 80mm with 21,000kL usage | 70,427 | 69,492 | 71,281 | 73,016 | 4% |
| **Non-residential – untreated water[a] (water bills only as no sewerage services are provided)** | | | | | |
| 20mm with 250kL usage | 723 | 736 | 754 | 773 | 7% |
| 25mm with 1,000kL usage | 2,092 | 2,131 | 2,184 | 2,239 | 7% |
| 40mm with 2,100kL usage | 4,629 | 4,714 | 4,832 | 4,953 | 7% |
| 80mm with 21,000kL usage | 38,423 | 39,142 | 40,121 | 41,124 | 7% |

[a] 2018-19 bills calculated using 2018-19 usage prices for non-pipeline customers. From 2019-20 onwards both non-pipeline and pipeline customers would pay the same price. See Section 11.3 for impact analysis for pipeline customers.

**Note:** Sewerage service charges for non-residential customers are based on water meter size. The applicable meter charge is set using the formula: (meter size)$^2$x20mm meter charge/400xdischarge factor.

We have calculated service charges for larger meter sizes using this formula. We have estimated bills using a standard discharge factor of 70%, as indicated in Essential Energy's pricing proposal (p 200). Actual bills will depend on discharge factors for individual customers.

Bill impacts include our estimate of cumulative inflation of 6.8% over the 2019 determination period

**Source:** Essential Water pricing model, September 2018 (based in $2018-19); IPART analysis.

### 1.1.4 Bills would increase for mining customers

We applied the same approach we used in the 2014 determination to set water prices for the mines in the 2019 determination (this is discussed in Chapter 8):

1. We first determined the mines' share of Essential Water's water revenue requirement, based on the mines' share of total water revenue over the 2015-18 period.
2. We then calculated the revenue that would have been recovered from maintaining 2018-19 prices for **all customers** over the 2019 determination period. We multiplied the mines' share of historical revenue (in step 1) to this revenue, to set the total water revenue recovered from the mines over the 2019 period.
3. We then set water usage prices at the same price as for other customers and calculated the expected revenue from usage charges using forecast water sales.
4. Lastly, we set service prices to recover the remainder of the mines' share of water revenue.

We set the mines' share of water revenue based on the revenue that would have been recovered from maintaining 2018-19 prices because we did not consider it appropriate to set mines' prices based on Essential Water's total water revenue requirement.

Applying this approach results in an increase in the mines' service price of around 20% in 2019-20. Because the mines' share of historical water usage has increased, the water service charges for the mines have increased. However, the total bill increase for mining customers is significantly less than the increase in the water service price – and less than Essential Water's proposed increase for these customers.

### 1.1.5 Essential Water would recover less revenue than proposed

Our draft decision is that Essential Water's total notional revenue requirement (NRR) is $152.9 million over the three years to 2021-22. Table 1.5 outlines our draft decision on the efficient revenue requirement for Essential Water, and the key differences to Essential Water's proposal.

**Table 1.5 Draft decision on Essential Water's proposed revenue requirement ($2018-19)**

| $ millions | Essential Water's existing network costs | Consequential works costs | Broken Hill Pipeline transportation costs | Total |
|---|---|---|---|---|
| Essential Water proposed | 73.4 | *8.7*[a] | *92.8*[b] | *174.9* |
| IPART's draft decision | 63.8 | 3.5 | 85.6 | 152.9 |

**a** Essential Water did not propose a NRR for consequential works. We have calculated this based on information provided by Essential Water on capital expenditure, assuming a pre-tax WACC of 5.1%, and an economic life of 98 years for all expenditure.

**b** Essential Water did not propose a NRR for the Pipeline transportation costs. This figure is WaterNSW's proposed NRR for these costs (see WaterNSW pricing proposal to IPART, June 2018, pp 49, 56). We are reviewing the efficient costs of the Pipeline in our concurrent WaterNSW price review of prices for the Murray River to Broken Hill Pipeline from 1 July 2019.

**Source:** Essential Water pricing model; IPART analysis.

The NRR reflects the total efficient cost required by Essential Water to provide water and other services to its customers over the determination period. We established this amount by separately estimating:

- The efficient operating and capital costs Essential Water will incur to provide services via its **existing network,** and any **consequential works** required to service customers as a result of the Pipeline.
- The **transportation costs** Essential Water will incur in obtaining bulk water via the Pipeline. We used our draft decisions on the prices WaterNSW can charge Essential Water for this service to calculate these costs.[10]

We also considered what share of efficient costs should be paid by customers, and what share should be funded by the NSW Government, given its funding commitment for the Pipeline.

#### Essential Water did not include all the costs of supplying its services

Essential Water proposed that it requires $100.1 million ($2018-19) in revenue from customers over a four year determination period.[11]

However, as it only included the operating and capital costs of maintaining its existing network, this did not include the full costs of providing water and sewerage services to its customers over the next four years. Specifically, it did not include:

- The cost of transporting bulk water through the Pipeline,

10 We are setting maximum prices for WaterNSW as part of a separate, concurrent review that will assess the efficient construction, maintenance and operating costs of the Pipeline. For more information, see: IPART, Review of prices for WaterNSW Murray River to Broken Hill Pipeline from 1 July 2019 – Draft Report, April 2019.

11 Essential Water proposed a four year period for its 2019 Determination. See Essential Water pricing proposal to IPART, July 2018, p 21.

- The cost of consequential works that Essential Water considers are needed as a result of the Pipeline.

Instead, Essential Water proposed that these costs should be passed-through to customers if alternative funding (eg, from Government) was not secured (see Section 3.3).

### Lower operating expenditure for Essential Water's existing network

Essential Water proposed total direct operating expenditure of $36.0 million over the 3-year determination period (excluding the cost of transporting bulk water via the Pipeline and corporate overheads).[12]

Our assessment of efficient direct operating costs for this determination period is $31.1 million, excluding the cost of transporting bulk water via the Pipeline and corporate overheads. However, our assessment of total efficient operating costs is $121.8 million, including the efficient costs of transporting bulk water via the Pipeline and corporate overheads (see Chapter 5 for further details).

### Lower capital expenditure

Essential Water's proposed capital expenditure for the three year period is:

- $47.4 million for its existing network, excluding consequential works associated with the Pipeline and corporate overheads. The key driver is the proposed replacement of the Wills Street wastewater treatment plant.
- $46.8 million for consequential works (including contingencies and overheads), to be funded by the NSW Government.

Our assessment of Essential Water's efficient forecast capital expenditure for the 2019-22 determination period is:

- $28.7 million for its existing network, excluding consequential works and corporate overheads. This is $18.7 million (or 39%) less than Essential Water's proposal. The majority of this reduction comes from delaying the replacement of the Wills Street wastewater treatment plant.
- $19.9 million for consequential works (including contingencies and overheads), which is 57% less than Essential Water's proposal over the same period.

We have included a total allowance of $29.3 million for capital costs over the three year determination period, comprising of a return on capital and return of capital (see Section 4.3 and Appendix F).

12 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 62.

### 1.1.6 We have recommended a NSW Government funding contribution of $78 million

The NSW Government has committed to subsidise the full efficient costs of the Broken Hill Pipeline, to ensure that prices for end use customers do not rise in real terms as a result of the Pipeline (see Box 1.1 below).

**Box 1.1 NSW Government funding commitment**

The NSW Government has committed to subsidise the full efficient costs of the Broken Hill Pipeline (for four years from 2019), to ensure that prices for end use customers do not rise in real terms as a result of the Pipeline.[a]

The intention of this decision is that the Government will fund the Pipeline costs so that any price increases above CPI are not due to the Pipeline. This still leaves open the possibility of price increases for reasons other than the Pipeline.

We have set prices to reflect efficient costs of providing services less any confirmed Government subsidies or grants.

[a] NSW Government, Letter to the Chair – IPART, 21 November 2018. Available at: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-metro-water-legislative-requirements-prices-for-essential-energys-water-and-sewerage-services-in-broken-hill-from-1-july-2019/letter-from-the-minister-on-the-broken-hill-pipeline.pdf

We have considered the Government's commitment in setting prices. Under our draft prices, the revenue that Essential Water would recover from customers ($25 million per year, on average) is less than the total efficient cost of supplying water and other services to its customers ($51 million per year, on average). Therefore, we have recommended a NSW Government contribution (of $26 million per year, on average) be made to recover this difference. This is discussed further in Chapter 4.

Our draft decisions to implement a few small price structure changes have been made to increase the cost-reflectivity of these charges, and are independent of the Pipeline.

## 1.2 Structure of this Draft Report

The rest of this Draft Report provides more information about how we reached our draft decisions, and how these compare to Essential Water's pricing proposal:

- Chapter 2 outlines the context for the review, including Essential Water's operations, and how this review relates to other recent or concurrent pricing reviews.
- Chapter 3 discusses the decisions we make before setting prices, including the form of regulation, and risk sharing mechanisms.
- Chapter 4 discusses our draft decisions on the length of the determination period, and our approach to calculating the revenue requirement.
- Chapters 5 and 6 discuss our assessment of efficient operating and capital expenditure for Essential Water.
- Chapter 7 discusses forecast water sales and customer numbers.
- Chapters 8 to 10 set out our draft price structure decisions and draft prices for water, sewerage and other services.
- Chapters 11 and 12 presents customer bill impacts of our draft pricing decisions, and implications on Essential Water and the environment.

Our draft decisions and draft recommendations are set out in these chapters, and are also listed below for convenience. Stakeholders are free to comment on any or all of these decisions and recommendations, or any other matter relevant to our review. However, we are particularly interested in comments on:

- The introduction of a deemed sewerage usage component for residential customers (see Section 9.4).
- Draft water usage prices for chlorinated and untreated water customers (see Section 8.6).
- Draft trade waste prices (see Section 10.2).

### 1.2.1 List of draft decisions

## Allowance for operating expenditure



## Prudent historical and efficient forecast capital expenditure



## Forecast water sales and customer numbers



## Water prices

### 1.2.2 Recommendations



### 1.2.3 Questions on which we seek comment

# 2 Context for the review

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

- Essential Water's role and its water and sewerage services
- Its current and proposed water supply and sewerage operations
- How bills and median incomes in Broken Hill compare to other areas
- Our considerations in setting maximum prices for this review, and
- Our review process.

## 2.1 Essential Water's role and services

Essential Water is an operating division of Essential Energy,[13] which is a NSW Government-owned 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.[14]

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 900 non-residential customers.[15] 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.

13 Essential Water website, http://www.essentialwater.com.au/#, accessed 3 August 2018.
14 Essential Water pricing proposal to IPART, July 2018, Customer Summary, p 4.
15 Essential Water pricing proposal to IPART, July 2018, p 31.
16 Essential Water Annual Information Return, July 2018.

- **Untreated water** – also known as raw water – to some locations in Broken Hill and Menindee, and to customers along the Menindee and Umberumberka pipelines.
- **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 9,700 properties in the city of Broken Hill, including some houses and other buildings in the Perilya mining lease area.[17] It operates two sewage treatment plants, and after treating, sells around half of this 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 about 250 non-residential customers in the city of Broken Hill only.[18]

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.[19] 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

17 Essential Water pricing proposal to IPART, July 2018, p 31.
18 Marsden Jacob Associates, Review of proposed prices for trade waste and miscellaneous prices – Essential Water, February 2019, p 8.
19 It also holds a licence to extract 29 ML per year of raw water for Menindee.

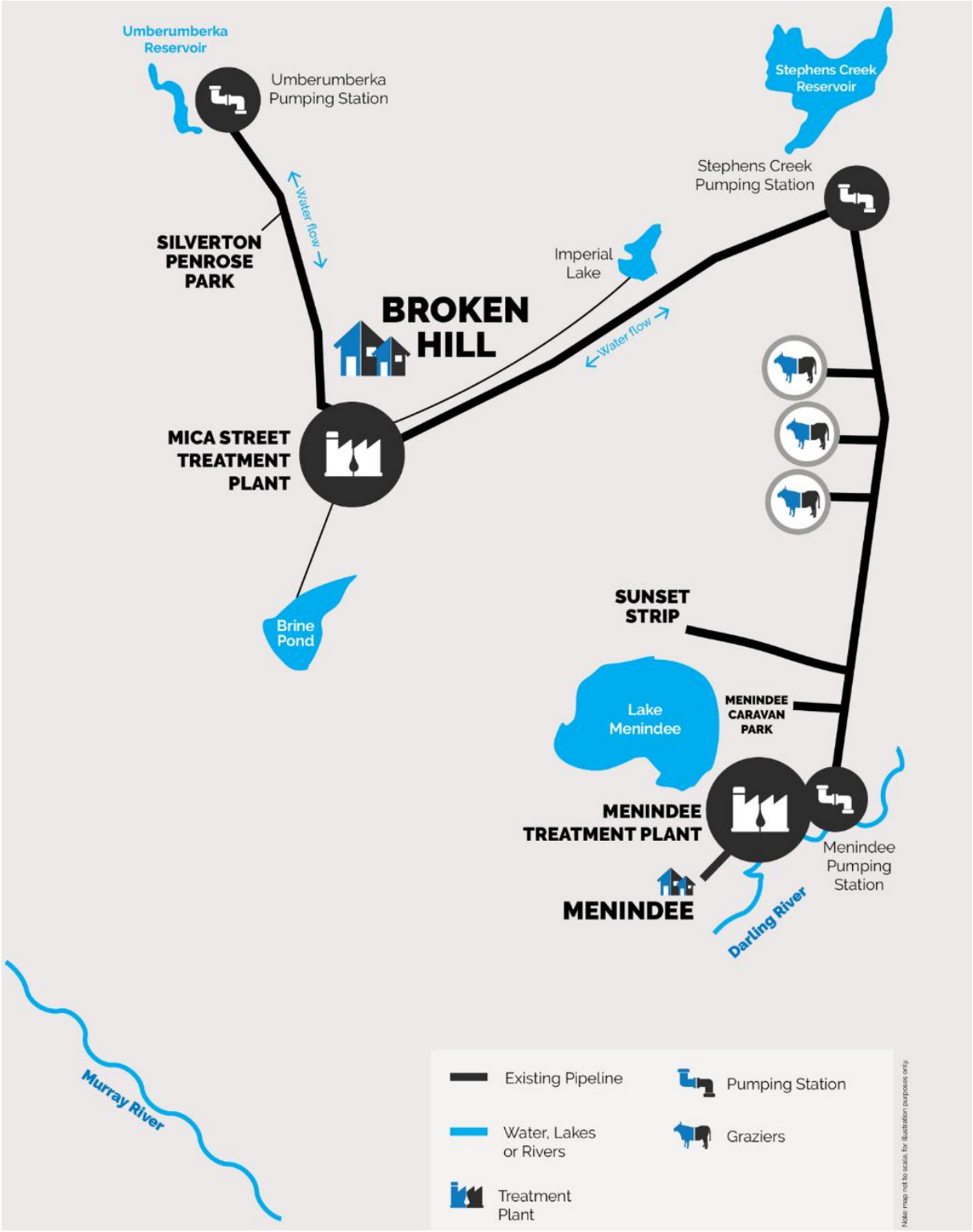
over a distance of 116 km from its source at the Darling River to the Mica Street water treatment plant in Broken Hill.

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 an emergency storage only.

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.[20] 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 270 km pipeline from the Murray River to Broken Hill.[21] The Minister for Regional Water directed WaterNSW, under section 20P of the *State-Owned Corporations Act*, to build a 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.[22]

WaterNSW is also building a bulk water storage facility, with capacity of 720 ML. 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

20 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.

21 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-to-secure-broken-hill-water-supply/

22 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.[23] These additional assets include:

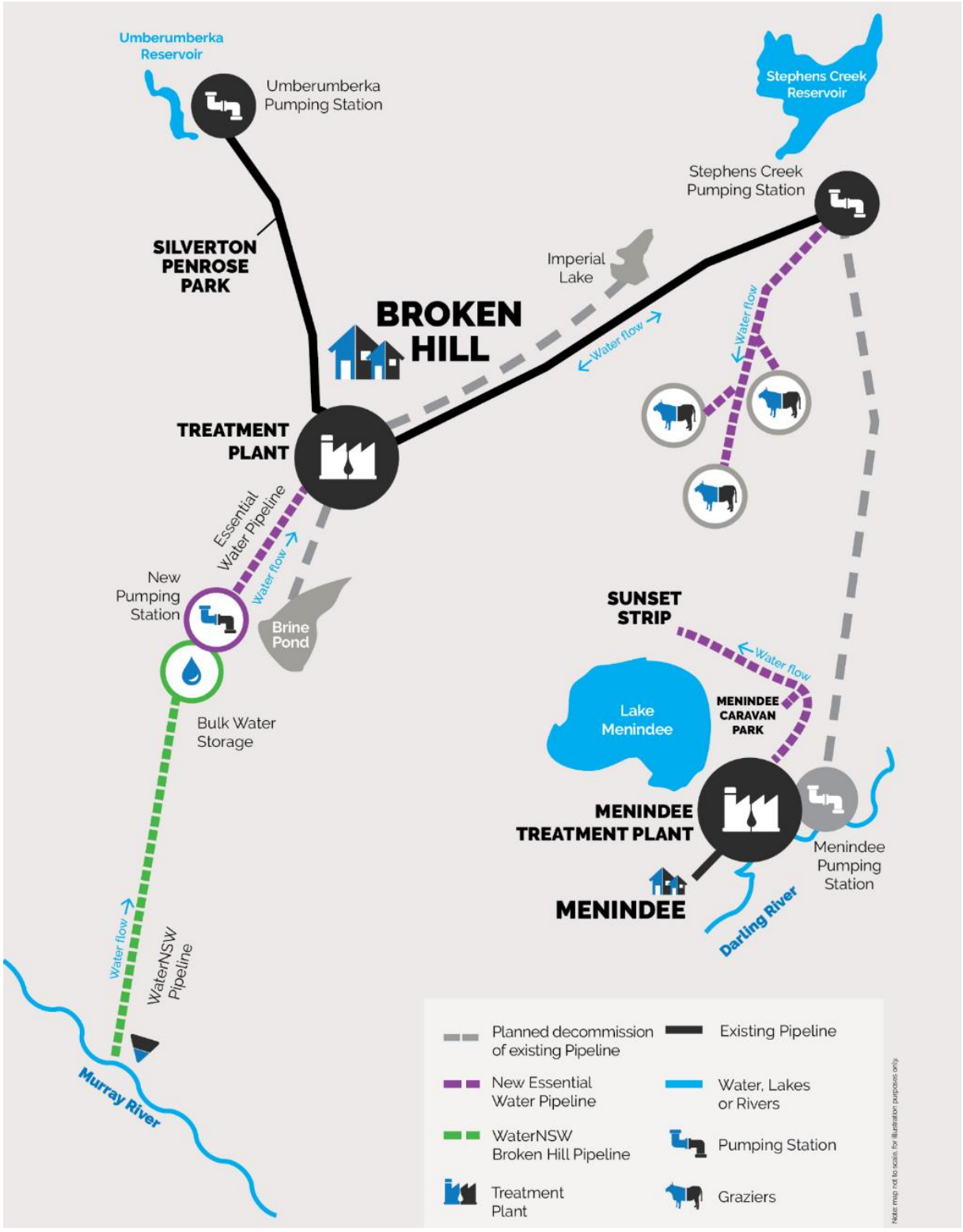
- The final section of pipeline and a pump station to transport water around 20 km from WaterNSW's bulk storage to Broken Hill's main water treatment plant at Mica Street, as well as auxiliary works to integrate the pipeline into the treatment system, and
- Electricity infrastructure needed to power 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.

23 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 Stephens 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 Stephens 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 Stephens 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 Reverse Osmosis (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:

- 8.1 GL per year from the Murray River water source, to supply the new pipeline, and
- 0.4 GL per year from the Lower Darling River water source, to supply its customers in Menindee and Sunset Strip.[24]

We are currently reviewing WaterNSW's Murray River to Broken Hill Pipeline services from 1 July 2019, and will determine WaterNSW's efficient costs to transport bulk water. From that review, we have incorporated the efficient costs that Essential Energy would incur to purchase bulk water from the Murray River to Broken Hill Pipeline.[25]

### 2.2.5 Sewerage operations

Essential Water has two wastewater treatment plants – Wills Street and South Broken Hill. Sewerage is piped through a network of 228 km of reticulation mains and 11 pumping stations

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

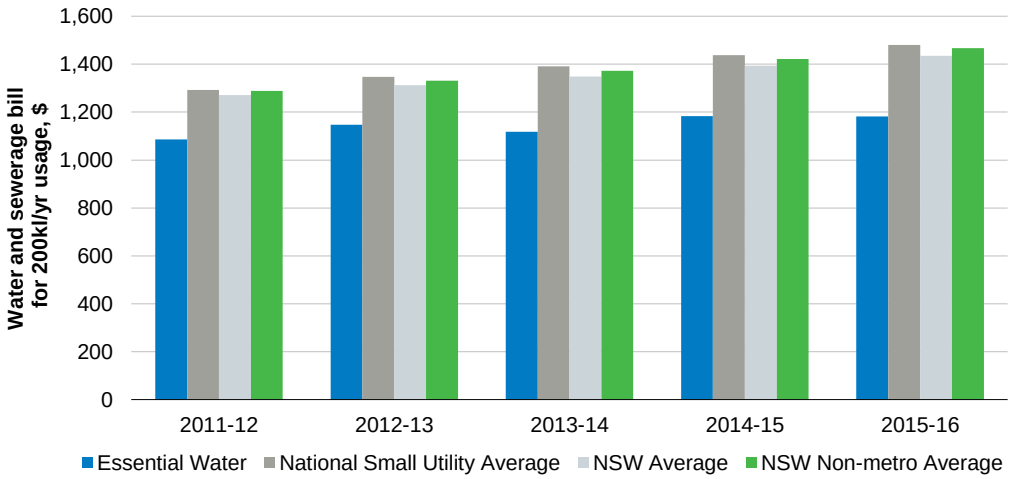
25 Information on that review is available on our website: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Rural-Water/Prices-for-WaterNSW%E2%80%99s-Murray-River-to-Broken-Hill-Pipeline-services-from-1-July-2019

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 How bills compare in Broken Hill to other areas

Essential Water's current prices for water and sewerage are lower than the average across NSW and regional water utilities (Figure 2.3).

**Figure 2.3 Essential Water bills compared against other utilities ($2015-16)**

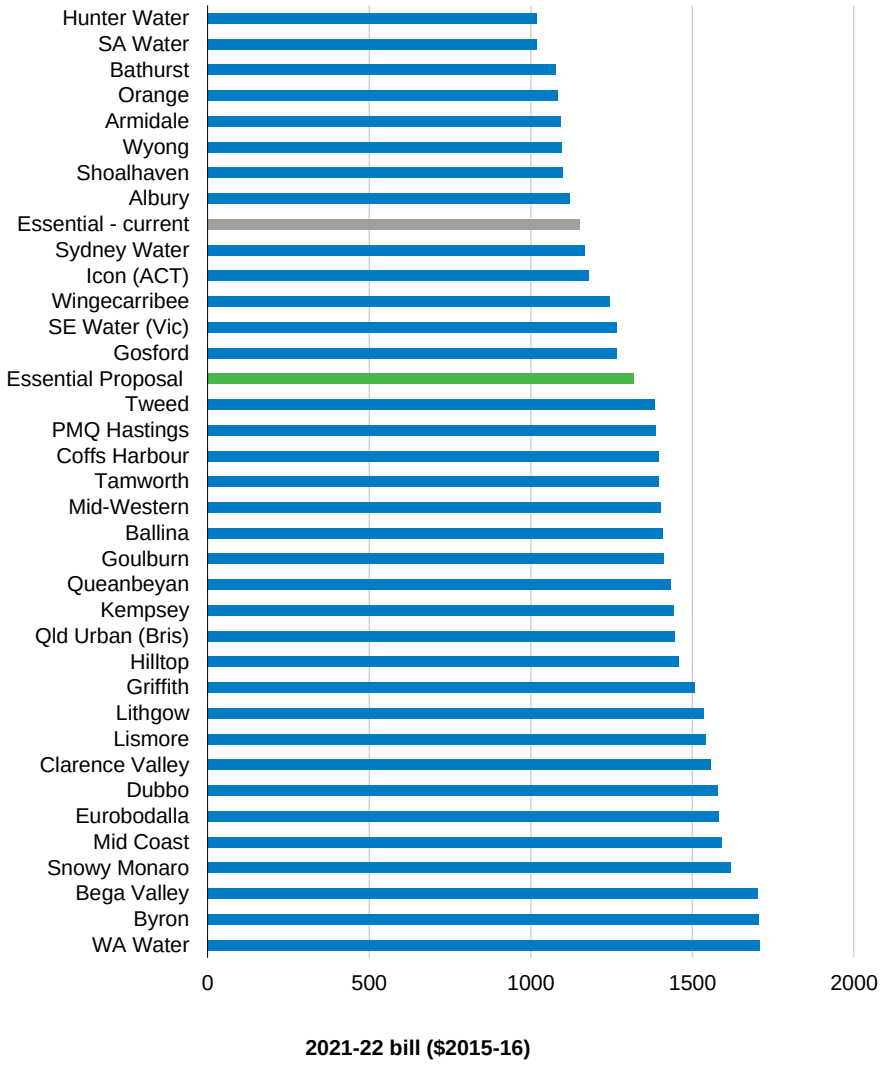



**Source:** Bureau of Meteorology, Urban National Performance Report, 2016-17.

Figure 2.4 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 also suggests that if Essential Water's pricing proposal was adopted, bills would be lower than 22 of these utilities by 2021-22.[26]

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

**Figure 2.4 Essential Water bills and rankings compared against other utilities ($2015-16, real)**

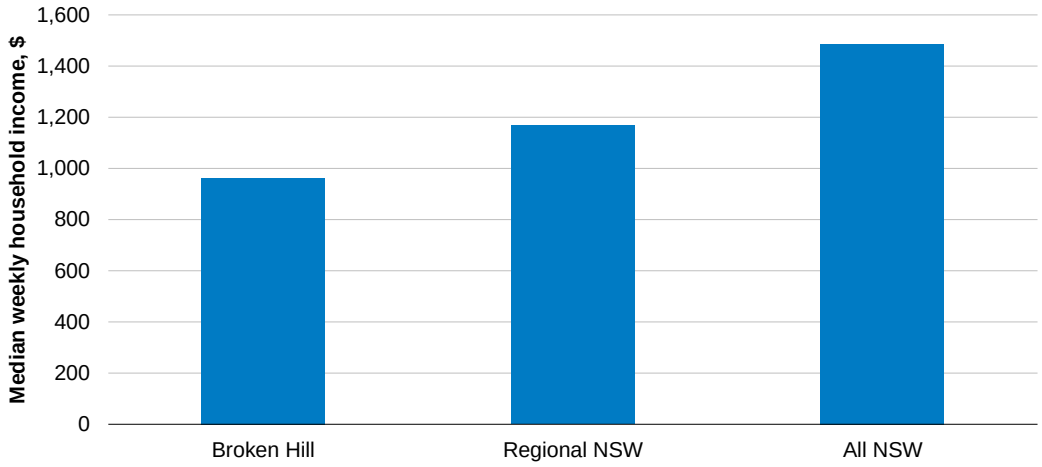



**Note:** Essential Water's current bill and its proposed for 2021-22 is based on water usage of 200 kL per year.

**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.

We also note that median household incomes in Broken Hill are substantially lower than those in regional NSW and NSW as a whole (see Figure 2.5). We further analyse how affordable bills are in Broken Hill, compared to other areas and relative to gross household median income, in Appendix C.

**Figure 2.5 Gross median weekly household income, Broken Hill, regional NSW and all NSW ($2016)**




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

## 2.4 Our general approach to setting prices

When setting prices, we balance our preference for prices to be cost-reflective against a range of other factors, including customer affordability and government funding commitments. Box 2.1 outlines our principles in setting prices.

**Box 2.1 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 historical and efficient forecast 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.

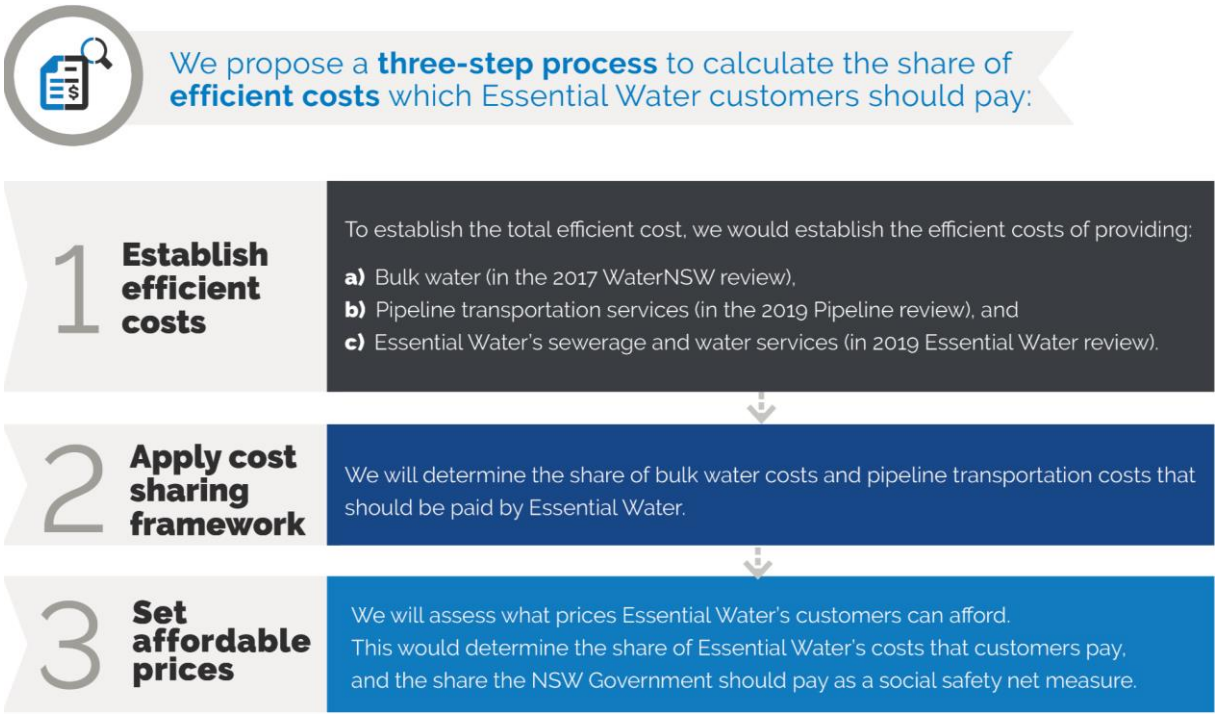
Prices that are cost-reflective also promote efficient investment in water infrastructure and service provision – by ensuring that the regulated business cannot recover capital that is invested inefficiently or unwisely from the prices paid by customers.

However, we also consider other factors when setting prices, including customer impacts. For example, we may assess that customers cannot afford to fund the full efficient costs of delivering water and sewerage services. In other words, prices may not be fully cost-reflective.

In our Issues Paper, we proposed to establish efficient costs and set affordable prices by taking the following three steps (Figure 2.6):

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.
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.

**Figure 2.6 Framework for establishing efficient costs and setting affordable prices**




In applying this framework, we have considered the NSW Government's commitment to price stability. In November 2018, the NSW Government advised us of its decision to subsidise the costs of construction and efficient operation and maintenance costs required for the Murray River to Broken Hill pipeline for the next four years from 2019-20 to 2022-23 to ensure that prices for end use customers do not rise in real terms as a result of the pipeline.[27] It also advised that it is also considering whether the subsidy will extend to the consequential works that Essential Water has proposed be undertaken as a result of the pipeline.

In determining what prices should be paid by Essential Water's customers, we have made a draft decision to maintain constant prices for most customers, and recommended that the

27 NSW Government, Letter to the Chair – IPART, 21 November 2018. Available at: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-metro-water-legislative-requirements-prices-for-essential-energys-water-and-sewerage-services-in-broken-hill-from-1-july-2019/letter-from-the-minister-on-the-broken-hill-pipeline.pdf

difference between the total efficient costs of supplying services to customers, and the amount actually recovered from customers, is funded by a NSW Government contribution to Essential Water. At the same time, we have also introduced some price structure changes to improve the cost-reflectivity of these prices, consistent with our price setting principles.

In addition, as mentioned previously, in Appendix C we further analysed how affordable bills are in Broken Hill compared to other areas, taking into account the relative level of incomes in Broken Hill. This analysis suggests there could be some scope to increase prices in real terms without bills becoming unaffordable for customers.

## 2.5 Our review process

We are the principal economic regulator in New South Wales. Our main functions are set out in the IPART Act. Among other responsibilities, we determine the maximum prices for declared government monopoly services provided by water utilities, such as Sydney Water Corporation, Hunter Water Corporation and Essential Water.[28,29]

In determining maximum prices, we have considered the matters under section 15 of the IPART Act (see Appendix A). Section 15 requires us to consider a range of matters when determining prices, including the costs of providing the services, customer affordability, environmental impacts and service standards.

### What this review is about

This Draft Report sets out our draft decisions (and reasons) for the maximum prices that Essential Water can charge for its water, sewerage and miscellaneous and ancillary services over the 2019 determination period.

As discussed previously, the substantial change to Essential Water's operations is purchasing bulk water from WaterNSW's Murray River to Broken Hill pipeline. Therefore, our draft decisions on the maximum prices that Essential Water can charge for providing water services to its customers in Broken Hill are affected by other reviews, briefly outlined in Figure 2.6. Essential Water's efficient costs to deliver water services include its own existing water network costs, in addition to the costs from the following reviews:

- 2019 WaterNSW's Murray River to Broken Hill pipeline review – this concurrent review will determine the maximum prices that WaterNSW can charge for the transportation services it provides to deliver bulk water from the Murray River to customers, including Essential Water. The cost of the transportation services have been included in Essential Water's operating costs. However, water prices have not increased in real terms due to the Pipeline transportation costs – and we have recommended that the amount not recovered from prices is funded by a NSW Government contribution to Essential Water.

28 Under s 11(1) of the IPART Act, we investigate and report on each declared monopoly service provided by these utilities that falls within the scope of the *Independent Pricing and Regulatory Tribunal (Water Sewerage and Drainage Services) Order 1997* (NSW).

29 We are also currently reviewing prices for the Central Coast Council's water, sewerage and stormwater drainage services from 1 July 2019. Information on that review is available on our website: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-Central-Coast-Council-from-1-July-2019

- 2017 WaterNSW's Rural Bulk Water services review – in this review we set the maximum prices that WaterNSW can charge for the bulk water supplied from the Murray River that is transported by the Murray River to Broken Hill pipeline.
- 2016 Water Administration Ministerial Corporation (WAMC) review – in this review we set the maximum prices that WAMC can charge for water management services, including for the Murray River.[30]

### Next steps in our review

We will consider all submissions received in response to our Draft Report and Determination, prior to releasing our Final Report and Determination in May 2019. The indicative timetable for this review is outlined in Table 2.1 below.

**Table 2.1 Indicative review timetable for Essential Water**

| Task | Timeframe |
|---|---|
| Received Essential Water's pricing proposal | 13 July 2018 |
| Released IPART's Issues Paper | 25 Sep 2018 |
| Received submissions to the Issues Paper | 30 Oct 2018 |
| Held Public hearing | 20 Nov 2018 |
| Received letter from the Minister on the NSW Government's funding commitment for the Murray River to Broken Hill Pipeline | 21 Nov 2018 |
| Released Draft Report and Draft Determination | 2 Apr 2019 |
| Deadline for submissions to the Draft Report | 24 Apr 2019 |
| Release Final Report and Determination | May 2019 |

**Note:** These dates are indicative and are subject to change.

In making our draft decisions, we have considered all submissions received through the review and all the matters we are required to under section 15 of the IPART Act. As part of our review process, we have undertaken extensive investigation and public consultation. We:

- Received Essential Water's pricing proposal in July 2018. This proposal outlined the expenditure necessary to maintain service levels and respond to regulatory requirements as well as its proposed plan to recover this expenditure.
- Released an Issues Paper in September 2018 which set the context of the review and discussed issues that we sought views on from the public and stakeholders.
- Invited stakeholders to make submissions on the Issues Paper and the utility's proposal by October 2018.
- Held a public hearing on 20 November 2018 that discussed the issues raised by Essential Water and other stakeholders.
- Engaged independent consultants to review Essential Water's proposed:
  - Operating expenditure, capital expenditure and asset lives (Aither)
  - Water sales and customer numbers (Frontier Economics)
  - Prices for trade waste and miscellaneous services (Marsden Jacob Associates), and

30 WAMC's charges recover the costs of water planning and management and apply to regulated rivers, unregulated rivers and groundwater areas. The Murray River is a regulated river to which WAMC's charges apply.

- Released this Draft Report and Draft Determination to invite stakeholders to make submissions in response to the draft decisions by 24 April 2019.

Our reports, stakeholder submissions, the transcript from the public hearing, and consultants' reports are available on our website (www.ipart.nsw.gov.au).

# 3 Decisions we make before setting prices

This chapter discusses a range of decisions we need to make before setting prices. It discusses Essential Water's proposal and our draft decisions on:

- 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 Chapter 4 we discuss the elements of our building block approach we use to establish the revenue Essential Water requires to deliver its services efficiently.

## 3.1 Set maximum prices to provide certainty

### We made a draft decision

1 To set maximum prices for each of Essential Water's services in each year of the determination period (a price cap).

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 we encourage the utility to be more efficient.

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

There are several forms of price control and each provide different incentives to the regulated entity to deliver its services more efficiently, and different distributions of risk between the regulated entity and its customers. Some of the most common forms are summarised in Box 3.1.

**Box 3.1 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.

### 3.1.1 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 relatively small size of its water and sewerage 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 3.3.1).

### 3.1.2 IPART's analysis

We agree that the current form of regulation (ie, price caps) is appropriate, as it provides certainty and stability for both customers and Essential Water. We note that no alternative forms of regulation were raised by stakeholders.

## 3.2 Introduce an efficiency carryover mechanism to promote future efficiency savings

We made a draft decision

2 To introduce an Efficiency Carryover Mechanism (ECM) for Essential Water's 2019 determination.

Our draft decision to maintain the current price cap form of regulation means that we set maximum prices that reflect our best estimate of the efficient costs Essential Water will incur to deliver regulated services over the determination period, less our recommended NSW Government contribution for the Pipeline.

Therefore, if Essential Water is able to be more efficient during the determination period, our current approach would allow Essential Water to keep these savings 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.

A shortcoming of our current approach to incentive regulation is that the financial reward for achieving cost 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, three 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. This allows customers to benefit from efficiencies sooner.

Further information on our ECM is discussed in Appendix D.[31] Our ECM is currently limited to operating expenditure.

### 3.2.1 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.

31 Further information is also available in our 2016 Sydney Water final report (see IPART, *Review of prices for Sydney Water Corporation – Final Report, June 2016*, p 53).

### 3.2.2 IPART's analysis

Our draft decision would provide Essential Water with the option to seek an efficiency carryover if it identifies permanent cost savings to its operating expenditure. Our view is that introducing an ECM would provide an efficiency incentive and give Essential Water the option of applying for it. Since Essential Water can choose whether to use the ECM, it does not automatically increase its administrative costs. Therefore, we have decided to introduce an ECM as an option, to encourage Essential Water to be more proactive in pursuing efficiency gains.

Any savings identified by Essential Water would need to be assessed by IPART. For an ECM to apply:

1. Essential Water would have to include details of efficiency savings in its next pricing submission, and be able to demonstrate these are permanent efficiency improvements, and
2. IPART would assess the efficiency gain and the appropriate level of funds to be carried forward.

To apply the ECM we also need to decide on the duration (ie, the holding period) that the business would retain the permanent efficiency gains, before they are passed onto customers. Holding all else equal, a longer holding period will incentivise the business to make larger investments to find and deliver permanent efficiency savings. On the other hand, a longer holding period will delay when customers benefit from the savings. In addition, if there are savings available that require little if any investment, setting a longer holding period will have little impact other than providing the business a larger share of the overall benefit.

While it is possible to have a holding period that differs from the length of determination period, we consider that setting the ECM holding period equal to the length of the determination period, provides the appropriate incentives (ie, 3 years in the case of Essential Water's 2019 determination). This means that the ECM would apply to efficiencies made in years one and two of the 2019 Determination (see Appendix D). This is because:

- Essential Water would make its next pricing submission at the end of the second year or beginning of the third year of the 2019 determination period.
- We would undertake our review during the third year, with two years of actual expenditure available.

Efficiencies found in the third year could be assessed and incorporated into our pricing determination for the subsequent period, provided a future Tribunal decides to allow an ECM in the subsequent determination.

This is the same method that applies to other utilities where we have allowed an ECM.

We did not receive comment from any other stakeholders about the ECM.

## 3.3 Managing revenue and cost risks

As outlined in Section 3.1, 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 proposed a demand volatility adjustment mechanism.

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

We discuss these proposals and our draft decisions below.

### We made draft decisions

3 To introduce a demand volatility adjustment with a ±5% materiality threshold.

4 Not to accept Essential Water's proposal to introduce cost pass-through mechanisms for its four proposed events.

### 3.3.1 Demand volatility adjustment

Actual water sales will depend on a number of factors that can vary unexpectedly, including weather patterns and population changes. Therefore, we note that there is risk in setting prices based on a forecast of water sales, as actual sales may vary and are difficult to predict accurately.

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 ±5% materiality threshold).

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 depending on how water sales actually varied compared with forecast, rather than pre-determining an adjustment dependant on a fixed threshold.

Despite its actual water sales being lower than forecast over the 2014 determination period,[32] Essential Water has not proposed to trigger a demand volatility adjustment, because:

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

#### IPART's analysis

In the Issues Paper, our view was 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.

32 Essential Water submitted that its actual water sales were lower than forecast by 12% over the 2014 determination period, excluding water sales to the mines. Including water sales to the mines, we calculate that total water sales were lower than forecast by about 4% over the same period.

We have since decided to accept Essential Water's proposal for a demand volatility adjustment, with a ±5% materiality threshold. Essential Water will still need to apply to trigger the adjustment at the next determination period (ie, starting 2022-23), if the materiality threshold is met.

The demand volatility adjustment gives IPART flexibility to adjust Essential Water's revenue in the following determination period if actual water sales are more than 5% higher or lower than forecast. In the case where actual sales are lower than forecast (eg, if one of the mines were to significantly decrease its water consumption or shut down over the 2019 determination period), we will consider whether:

- Essential Water's costs could decline with reduced demand
- The revenue shortfall should be recovered from customers, or
- There is an economic case for 'stranding' some of Essential Water's assets.

Introducing a demand volatility adjustment is consistent with our decisions in the 2016 Determinations for Sydney Water and Hunter Water.

We did not receive comment from any other stakeholders specifically related to the demand volatility adjustment mechanism.

### 3.3.2 Cost pass-through events

Essential Water has proposed cost pass-throughs for four potential events that it considers are "unexpected" or "uncontrollable". Under its proposal, some or all of the actual cost of these events would be passed through to customers via prices (or in the event there are savings, customers would benefit via lower prices). This would transfer risk from Essential Water to its customers. The four cost pass-through events Essential Water proposed are for:

1. **Regulatory change events** – to address revenue gained or lost through a change in the regulatory, legal or tax environment.
2. **Drought relief events** – to recover costs for government directed drought relief measures.
3. **A Murray River to Broken Hill Pipeline event** – if costs associated with the Pipeline as incurred by WaterNSW and passed through to Essential Water are materially higher than those allowed by IPART, and
4. **A consequential works event** – if separate NSW Government funding is not secured.

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

Essential Water has proposed a materiality threshold of 2.5% of its Notional Revenue Requirement (NRR).[33] That is, a cost pass-through would apply if one of the triggers resulted in its revenue or costs changing by more than ± 2.5% of the NRR. In this event, Essential Water proposes that some or all of these costs would be recovered from customers through prices.

#### Stakeholder comments

Stakeholders raised concern about the proposed cost pass-through events.

33 The NRR represents our view of the total efficient costs of providing Essential Water's regulated services in each year of the determination period.

The Broken Hill City Council submitted that the pass-through events are not appropriate given NSW Government commitments to fund the Pipeline.

The Public Interest Advocacy Centre (PIAC) also considered that it is inappropriate for Essential Water to implement cost pass-throughs and further increase cost-pressures because the new pipeline will reduce the risk of Essential Water having to address a drought. Furthermore, it considered that a regulatory change is a standard risk for all regulated businesses and not a special issue for Essential Water.

### IPART's analysis

We have assessed Essential Water's proposed cost pass-through events against our criteria, which are outlined in Box 3.2 below.

**Box 3.2 Criteria for cost pass-through mechanisms**

We consider that 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.

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

- We note that our framework for establishing Essential Water's efficient costs does not eliminate the risk of regulatory change events. 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. We consider it is important to provide an incentive for Essential Water to potentially influence the likelihood, and the resulting cost, of potential regulatory changes.
- The new Murray River to Broken Hill pipeline has been built to provide a reliable source of water, which means that Broken Hill would be less affected by drought. Therefore, the cost of drought relief events are unlikely to be material going forward.
- We do not consider the Murray River to Broken Hill pipeline and consequential works to be unexpected or uncontrollable events. Under our draft decisions we have incorporated our best estimate of the efficient costs to Essential Water of these events. We consider that there is scope for Essential Water to pursue further efficiencies in these areas and hence influence the resulting costs.

Further, 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.

## 3.4 Treatment of exempt customers

### We made a draft decision

5 Not to recover the foregone revenue from exempt customers from Essential Water's other customers.

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

Our approach for State Owned Corporations (including Essential Water) is that we do not include the expected shortfall in revenue due to exempt properties in their NRR, when 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 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. However, it is unclear to us why it is not appropriate. Essential Water has proposed funding these exemptions through existing pricing arrangements or by introducing cost-reflective tariffs for exempt customers.

Our draft decision remains that Essential Water should seek NSW 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.

Our draft decision is consistent with our approach for the other State Owned Corporations that we regulate (eg, Sydney Water and Hunter Water).

We did not receive comment from other stakeholders about the treatment of exempt customers.

# 4 Length of determination period and revenue requirement

This chapter outlines the next decisions we make when determining prices – the length of the determination period, and the amount of revenue to be recovered through prices over this period.

To decide on the amount of revenue to be recovered, we first calculated Essential Water's Notional Revenue Requirement (NRR) in this determination period. The NRR represents our view of the total efficient costs of providing Essential Water's regulated water, sewerage and other services in each year of the determination period.[34] Then, we calculated the revenue that Essential Water should recover from customers through an appropriate combination of usage (variable) and service (fixed) charges. Finally, we calculated the difference between the revenue recovered from prices, and Essential Water's NRR. We recommend that this difference is funded via a Government funding contribution to Essential Water.

The sections below provide a summary of our draft decisions, then discuss how and why we reached those decisions, including our consideration of Essential Water's proposal, stakeholders' comments and the NSW Government's decision that end use prices for customers will not increase in real terms as a result of the Murray River to Broken Hill Pipeline. Chapters later in this report provide more detail on how we reached our draft decisions on prices.

## 4.1 Summary of our decisions

We have made draft decisions to:

- **Set prices for three years.** This balances the increased uncertainty of forecasts as a result of the major changes to the Broken Hill water network, against the need to reduce regulatory burden.
- **Set an NRR of $153 million over this period.** This reflects the full efficient cost of providing water, sewerage and other services to Broken Hill customers.
- **Recover $75 million from end use customers over this period.** This reflects our draft decisions on prices, including our consideration of the Government's commitment that prices will not increase in real terms as a result of the Pipeline.
- **Recommend that the difference of $78 million over the period should be funded as a Government contribution to Essential Water.**

34 This excludes the revenue required for trade waste and miscellaneous services, as these are charged for separately.

In setting the NRR, we also discuss our draft decisions:

- To set a draft Weighted Average Cost of Capital (WACC) of 4.2%, by applying our 2018 WACC method.
- To adopt a 60% gearing ratio, to reflect the risks that an efficient benchmark business would face in supplying water to the Broken Hill market.
- To account for changes in the cost of debt through a regulatory true-up in the following period, which would promote price stability for customers.
- To adopt a 30% tax rate for this review, because our NRR for Essential Water is above the small business tax threshold.
- To broadly accept Essential Water's proposed approach for recovering corporate overhead costs.

## 4.2 Length of determination period

### We made a draft decision

6 To adopt a 3-year determination period from 1 July 2019 to 30 June 2022.

For each water pricing review, we decide on the length of the determination period. In general, this length can be between one and five years. In deciding on the appropriate length, we considered the range of factors outlined in Box 4.1.

Essential Water submitted that it was a relatively small business and that pricing reviews impose a proportionally large regulatory burden. Therefore, it considered that a four-year period would be reasonable in providing it with regulatory certainty and financial stability.[35]

For this review, we consider that a 3-year determination period is appropriate, rather than a 4-year period as proposed by Essential Water, because:

- **The major changes to Broken Hill's water supply reduced the confidence we can place in forecasts.** The Pipeline is a significant new asset that will deliver bulk water to Essential Water. The key areas of uncertainty are the actual volume of water that Essential Water will demand from the Pipeline, and the efficient cost of the consequential works. Further, there is uncertainty over some of Essential Water's proposed capital projects. This includes the timing and costs involved in potentially replacing the Wills St sewerage treatment plant (see Chapter 6 for further discussion).

35 Essential Water pricing proposal to IPART, July 2018, p 49.

- **This determination length appropriately balances risk and regulatory burden.** Whilst a shorter determination period can create greater regulatory burden for Essential Water, the revenue allowances that we set are more likely to be cost-reflective over a shorter period given the uncertainty (and the risks involved) in the significant change in operating environment for Essential Water, and the potential cost involved in possibly replacing Wills St sewerage treatment plant. A shorter determination period would provide opportunity for Essential Water to better understand the changes to its operating environment and allow it to better investigate the efficiency of proposed expenditures, prior to IPART potentially adopting a longer determination period in the next price review.

**Box 4.1 Factors we consider in deciding the length of a 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
- Stakeholders' 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.

We note that the NSW Government has made a commitment to fund the efficient costs of the Pipeline for four years, ie, until 30 June 2023 (discussed in Section 1.1). Our draft decision does not impact the NSW Government's commitment, and would mean that consumers have certainty over funding of the Pipeline for the first year of the subsequent review (the 2022 Essential Water price review). In setting prices at the 2022 price review, we would consider the efficient costs in providing water and sewerage services in Broken Hill (including the ongoing efficient costs of the Pipeline), any potential NSW Government decisions regarding the Pipeline costs beyond 30 June 2023, as well as what is affordable for end use customers.

Our draft decision is also to set a 3-year determination period for the Pipeline.[36] We consider it useful to align these two reviews. Whilst we did not receive stakeholder submissions directly commenting on this issue, concerns have been raised about the impact of the Pipeline costs on final water prices in Broken Hill.[37] Given that the Pipeline represents a substantial

36 IPART, Review of prices for WaterNSW Murray River to Broken Hill Pipeline from 1 July 2019 – Draft Report, April 2019.

37 For example, Broken Hill City Council, Broken Hill City Council's submission to Essential Water's water and sewerage services in Broken Hill from 1 July 2019, and WaterNSW's Murray River to Broken Hill Pipeline services from 1 July 2019, October 2018, p 3.

portion of costs in providing water services in Broken Hill, we consider it appropriate to align these reviews to provide consumers greater certainty over final prices and hence bill impacts.

## 4.3 Calculating the notional revenue requirement

### We made a draft decision

7 To set the Notional Revenue Requirement (NRR) as shown in Table 4.1.

As for previous water utility reviews, we have used our standard 'building block' method to calculate the NRR. This method involves estimating, for each year of the determination period:

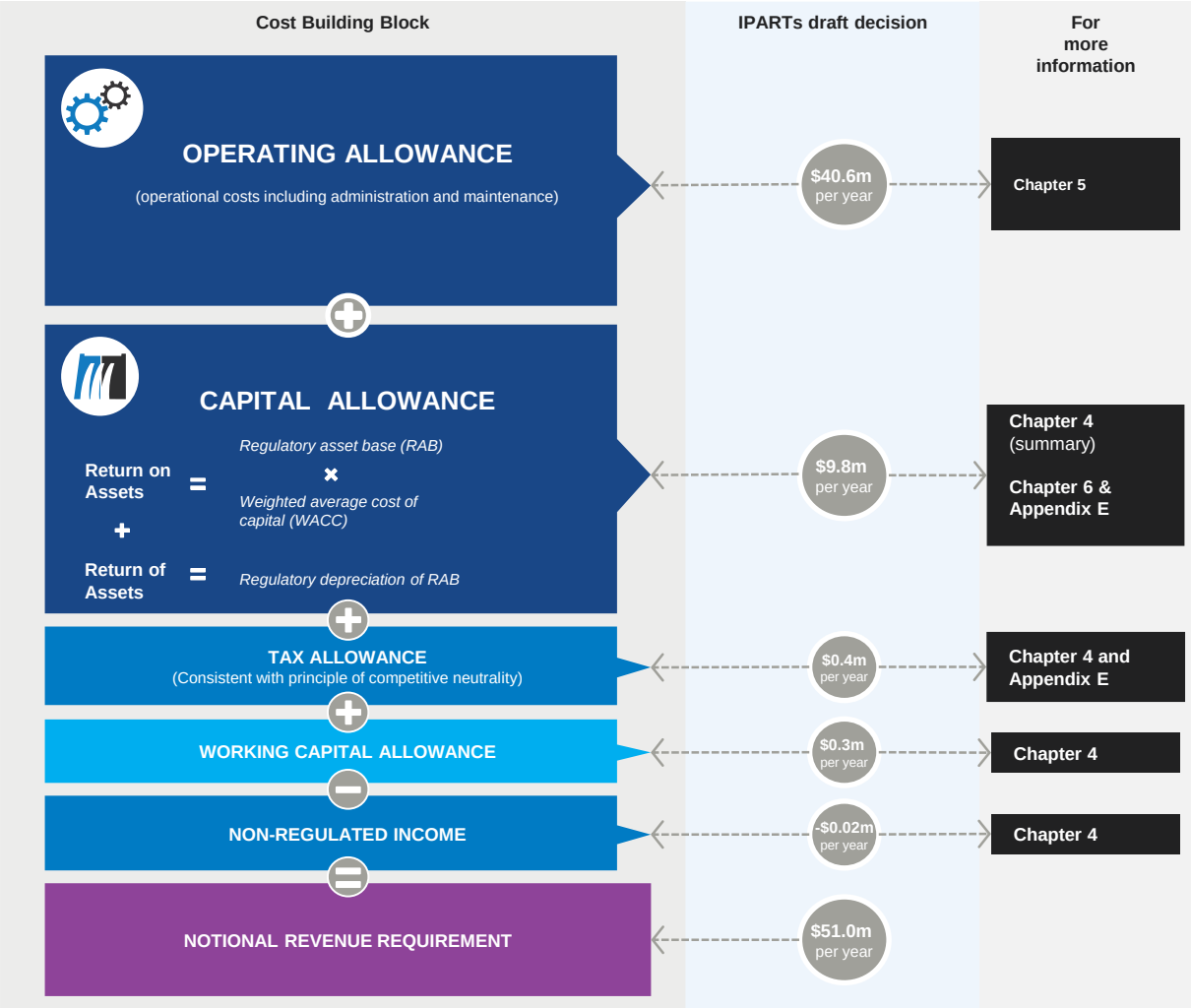
- An operating expenditure allowance
- A capital allowance, which comprises a return on the assets Essential Water uses to provide its services and a return of these assets (or regulatory depreciation)
- A tax allowance
- A working capital allowance, and
- Any 'non-regulated' revenue Essential Water is forecast to earn from non-regulated services it provides using its regulated assets.

We have also decided how Essential Water's corporate overhead costs should be apportioned to its operating and capital expenditure.

In Section 4.5 we discuss our draft decision on how the NRR should be recovered from customers, and our recommendation that the difference between the revenue from customers and the NRR should be recovered through a Government funding contribution to Essential Water.

As Figure 4.1 illustrates, the sum of the allowances, minus 50% of the non-regulated revenue equals the NRR.

## Figure 4.1 The building block model




**Note**: Totals are average amounts each year and may not add due to rounding.

**Table 4.1 IPART's draft decision on Essential Water's NRR, inclusive of Murray River Broken Hill Pipeline costs and consequential works ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total |
|---|---|---|---|---|
| Operating expenditure | **40.9** | **40.6** | **40.2** | **121.8** |
| *Operating expenditure excluding pipeline costs* | *12.6* | *12.2* | *11.9* | *36.7* |
| *Pipeline costs* | *28.4* | *28.4* | *28.4* | *85.1* |
| Capital costs | **8.9** | **9.9** | **10.5** | **29.3** |
| *Return on assets* | *6.2* | *6.8* | *7.2* | *20.2* |
| *Return of assets (regulatory depreciation)* | *2.8* | *3.1* | *3.3* | *9.1* |
| Return on working capital | **0.2** | **0.3** | **0.3** | **0.76** |
| Tax allowance | **0.2** | **0.2** | **0.7** | **1.1** |
| *Less* non-regulated revenues (50%) | *0.0* | *0.0* | *0.0* | *0.0* |
| **Total NRR** | **50.2** | **50.9** | **51.7** | **152.9** |

**Note:** Totals may not add due to rounding. Non-regulated revenue is $0.02 million per year, and totals $0.05 million from 2019-22.

We have assessed Essential Water's pricing proposal for each of the building block items, and our draft decision is that Essential Water's total notional revenue requirement is $152.9 million over the three years to 2021-22.

Our draft decisions on each of the building block items over the 2019 determination period are outlined below, and are discussed in more detail in the remainder of this report.

### 4.3.1 Operating expenditure

The draft operating expenditure allowance represents our estimate of Essential Water's forecast efficient operating, maintenance and administration costs. This is $121.8 million over the 3-year period, and includes the efficient costs of the Pipeline.

The reasons for our draft decision on operating expenditure is discussed in Chapter 5.

### 4.3.2 Capital allowance

Our draft capital allowance ($29.3 million over three years) is not intended to recover Essential Water's proposed investments in new assets over the period. Instead, it comprises:

- **A return on assets.** This amount represents our assessment of the opportunity cost of the capital invested in the assets used to provide its regulated water and sewerage and businesses – that is, its Regulatory Asset Base (RAB) – and aims to ensure that Essential Water can continue to make efficient capital investments in the future.

- **A return of these assets (or regulatory depreciation)**. This allowance recognises that by providing services to customers, a utility's assets will wear out over time, and therefore aims to ensure that the costs of the assets are recovered from users over time.

Establishing the capital allowance is more complex than the operating expenditure allowance. Broadly, we calculate the return on assets by multiplying the value of the RAB over the determination period by an efficient rate of return (the WACC). We calculate regulatory depreciation by applying a straight-line depreciation method to the RAB – that is, the cost of assets are recovered evenly over assumed economic life. We make draft decisions on the following inputs to these calculations:

1. The value of RAB at the start of the regulatory period (the opening value) and the start of each year of the determination period.
2. The efficient rate of return over the determination period, or the Weighted Average Cost of Capital (WACC).
3. The appropriate asset lives for Essential Water's assets.

### Draft decision on value of the RAB

We made a draft decision:

8 To set Regulatory Asset Base (RAB) values as shown in Table 4.2.

**Table 4.2 IPART's draft decision on Essential Water's RAB values ($millions, $2018-19)**

| | 1 July 2019 | 1 July 2020 | 1 July 2021 |
|---|---|---|---|
| Water | 91.7 | 112.3 | 119.1 |
| Sewerage | 44.5 | 46.2 | 47.7 |
| Non-system assets | 0.0[a] | 1.5 | 2.3 |
| **Total** | **136.2** | **160.0** | **169.0** |

[a] Our draft decision is to create a non-system RAB for corporate assets from 1 July 2019, hence the starting value is zero.

To make this decision, we established the **opening value** for the RAB, using the RABs we set when we last reviewed Essential Water's prices in 2014, and assessing Essential Water's actual capital expenditure over the determination period compared to the forecast capital expenditure. We also assessed Essential Water's proposed expenditure for the 2019 determination period to determine how much expenditure is efficient and used these findings (among other inputs) to **roll forward** the value of the RAB in each year of the 2019 determination period.

Chapter 6 discusses our assessment and findings on Essential Water's prudent historical and efficient forecast capital expenditure in detail, including Essential Water's proposed consequential works. Box 4.2 and Appendix F provide more information on our approach and inputs for rolling forward the RAB.

### Box 4.2 Summary of the RAB calculation

The RAB represents the value of Essential Water's assets on which we consider it should earn a return on capital and an allowance for regulatory depreciation (a return of capital). We assess the RAB at each price review to:

1. Adjust capital expenditure in the current determination period to reflect Essential Water's **actual prudent**[a] expenditure, when rolling forward the RAB to the start of the new determination period, and
2. Add our efficient **capital expenditure allowances** for the forthcoming determination period, when rolling forward the RAB to determine RAB values for each year of the new determination period.

Chapter 6 explains our tests for prudency and efficiency of past and forecast expenditure.

We make some further minor adjustments to the RAB. We:

- **Deduct cash capital contributions** to ensure that customers do not pay for a return on or return of capital expenditure that the utility has not funded itself. (These are contributions from third parties such as developers or government grants, for the purpose of capital expenditure.)
- **Deduct the regulatory value of disposed assets**, that is, when Essential Water sells or writes off an asset that is included in the RAB, it needs to be removed so that customers don't continue to pay a return on and of the asset that is not used to provide the services.
- **Deduct regulatory depreciation allowed in the previous determination,** to account for the difference in the forecast expenditure in the previous determination and the actual expenditure. (Doing this should provide an incentive to not overestimate capital expenditure forecasts.)

For this review, we also adjusted for the tax treatment of past cash capital contributions.

Appendix F provides more details on the RAB inputs.

**a** What we assess as 'prudent' expenditure may differ from Essential Water's total actual expenditure.

## Draft decisions on the WACC

We made draft decisions:

9 To set the Weighted Average Cost of Capital (WACC) at 4.2%.

10 To set a gearing ratio of 60% when calculating the Weighted Average Cost of Capital (WACC).

11 To account for annual changes in the cost of debt through a regulatory true-up in the following determination period.

To make our decision on the Weighted Average Cost of Capital (WACC) we applied our standard WACC methodology, which we updated in 2018 after an extensive review and broad stakeholder engagement.[38] This resulted in a real post-tax WACC of 4.2%, compared to Essential Water's proposed WACC, which ranged from 4.5% to 4.1% over the determination period.

Box 4.3 provides a broad outline of how we reached our draft decision on the WACC. Appendix F provides more information about the inputs we used in applying our WACC

38 IPART, Review of our WACC method, Final Report - Research, February 2018.

method, while Appendix G outlines a new process for estimating the equity beta parameter in the WACC that we are developing.

In our 2018 WACC review, we made a number of decisions that would improve our method for estimating the equity beta. We also made decisions to publish more information for stakeholders on how we estimate the equity beta, and to give stakeholders the opportunity to propose additional industries for the equity beta calculation.

We are developing a new process for estimating the equity beta, which includes the improvements we decided in the 2018 WACC review, as well as automating the extraction of financial market data and calculation of the equity beta.

We have not applied our new method to estimate the equity beta in this review, as we are still developing this process and we have not yet consulted with stakeholders on the new method.[39] To that end, we have released a Fact Sheet on our website which explains and seeks feedback on our new method to estimate the equity beta.[40]

We would have regard to the equity beta estimated with this method along with other evidence on beta in our future WACC decisions.

**Box 4.3 How we reached our decision on the WACC**

The WACC is our estimate of the efficient cost of capital to Essential Water. It is a hypothetical benchmark of a business' efficient cost of debt and equity. It is a weighted average to take account of the relative shares of debt and equity that a firm might have.

We use the WACC to calculate the return on assets that we allow the business, by applying it to the value of Essential Water's regulatory asset base (RAB). If we set a WACC that is too high, then customers would pay too much for the services and we risk encouraging too much investment in that business. If we set the WACC too low, then we risk the financial viability of the firm and encouraging too little investment. Neither of these outcomes is in the long-term interest of consumers.

To set the WACC, we use our established methodology that involves defining a benchmark entity and applying market-based parameters, including the risk-free rate, debt margin, market premium risk and inflation forecasts. See Appendix F for the parameter values we used to make our draft decision.

### Set a gearing ratio of 60%

To calculate the WACC, we decided on the appropriate gearing ratio (that is, what mix of debt and equity a benchmark efficient business would use to fund Essential Water's assets). Essential Water proposed maintaining our 2014 Determination gearing ratio of 55% to reflect the higher relative risk that Essential Water faced compared to metropolitan water utilities.[41] It submitted that this was due to the characteristics of the market it operates in, which are:

- Falling water demand due to a declining population, and

39 With that said, we note that our new process currently generates a similar equity beta estimate (0.74) to the draft value (0.7) we adopted as part of our draft WACC decision.
40 IPART, Estimating Equity Beta, Fact Sheet, March 2019.
41 Essential Water pricing proposal to IPART, July 2018, p 169.

- A high degree of customer concentration risk from a few large customers (mines) and little opportunity for substitution if the mines no longer require Essential Water's services.

We have reconsidered the gearing ratio, given our updated assessment of the risks a **benchmark business** would face in supplying water to customers in Broken Hill and purchasing most of its bulk water from a separate water supplier. We note that:

- In 2015, the NSW Government listed Broken Hill as Australia's first "heritage city", ie, a commitment to Broken Hill's ongoing existence as a city.[42] This commitment supports the existence of a water and sewerage market in Broken Hill.
- In November 2018, the NSW Government announced that it would subsidise the full efficient costs of the Broken Hill pipeline (for four years from 2019) to ensure that prices for end use customers do not rise in real terms as a result of the Pipeline.[43] This would reduce the risk that residents and businesses would exit the market.

We consider that the NSW Government's commitment and announcement would extend to a benchmark business operating in Broken Hill, which would thus would have a reduced level of risk (its revenues would be less affected by a declining market and concentration in a few large customers). Therefore, our draft decision is to adopt a gearing ratio of 60% for Essential Water's WACC, consistent with the gearing ratio we have adopted for other regulated water utlities in recent reviews.

### True-up for annual changes in the cost of debt

We also decided to account for annual changes in the cost of debt – one of the components of the WACC – through a regulatory true-up in the following determination period. In our recent review of our WACC method, we decided to transition to a trailing average cost of debt. We consider that this approach will allow regulated businesses to better manage their refinancing risk, while maintaining their incentives for efficient investment.

However, implementing a trailing average approach 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.

For this review, we decided 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 for this review because it would provide certainty to customers about their prices over the 2019 determination period. If the true-up is smoothed over the next regulatory period, we do not expect that price shocks would be any more likely under this approach

42 https://www.environment.gov.au/heritage/places/national/city-broken-hill [accessed 15 January 2019]

43 NSW Government, Letter to the Chair – IPART, 21 November 2018. Available at: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-metro-water-legislative-requirements-prices-for-essential-energys-water-and-sewerage-services-in-broken-hill-from-1-july-2019/letter-from-the-minister-on-the-broken-hill-pipeline.pdf

compared to an annual update. Essential Water proposed that annual changes to the cost of debt should be passed through to prices each year.[44]

#### Draft decisions on depreciation method and asset lives

To calculate the regulatory depreciation allowance (return of assets), we applied a straight-line depreciation method to the remaining life of Essential Water's assets. The straight-line method depreciates the value of all assets evenly over their assumed lives and is in line with Essential Water's proposal. We typically use this method in water price reviews, unless the utility proposes a different method and we agree with it.

Chapter 6 discusses our assessment of Essential Water's asset lives – for existing and new assets – in more detail.

### 4.3.3 Tax allowance

Our draft decision is to include a tax allowance of $1.1 million over the 3-year determination period, which is similar to Essential Water's proposal.

Our draft tax allowance is not intended to recover Essential Water's actual tax liability over the determination period. Rather, it reflects the liability that a comparable commercial business would be subject to. Including this allowance is consistent with our aim to set prices that reflect the full efficient costs a utility would incur if it were operating in a competitive market (including if it were privately owned). Thus, if we did not include a tax allowance, prices would be too low.[45]

Our approach for calculating this allowance is detailed in Appendix F.

### 4.3.4 Return on working capital

Our draft decision on the NRR includes a working capital allowance of around $0.8 million over the 3-year period, compared to Essential Water's proposed allowance of $0.04 million.

The working capital allowance ensures that Essential Water recovers the costs it incurs due to the time delay between providing a service and receiving the money for it (ie, when bills are paid). To calculate this allowance, we applied our standard approach to calculating the appropriate amount for working capital. In summary, this involves:

1. Calculating the net amount of working capital the business requires, using the formula:

   working capital = receivables – payables + inventory + prepayments

2. Calculating the return on this amount by multiplying it by the nominal post-tax WACC.

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

45 This approach to pricing monopoly services is consistent with the principle of 'competitive neutrality'. Through the Competition Principles Agreement (1995), the Australian and all State and Territory Governments have agreed to implement competitive neutrality policies as part of the National Competition Policy reform package. 'The objective of competitive neutrality policy is the elimination of resource allocation distortions arising out of the public ownership of entities engaged in significant business activities: Government businesses should not enjoy any net competitive advantage simply as a result of their public sector ownership.' Source: *Competition Principles Agreement – 11 April 1995 (As amended to 13 April 2007, section 3a)*, available at: https://www.coag.gov.au/about-coag/agreements/competition-principles-agreement).

More information on our standard approach can be found in our working capital Policy Paper on our website.[46]

### 4.3.5 Non-regulated revenue

Essential Water has been receiving about $0.05 million per year over the 2014-15 to 2017-18 period from the sale of treated effluent[47] (it has ranged from $0.03 million to $0.08 million each year). The treated effluent is sold to customers for use in operations, dust suppression and irrigation.

Our draft decision is to accept Essential Water's forecast revenue of $0.03 million per year as being reasonable and its proposal that 50% of the revenue (ie, $0.016 million) should be deducted from its notional revenue requirement. The rationale for sharing the revenue is that it gives Essential Water a financial incentive to pursue more revenue where appropriate – while ensuring that 50% of the benefits will eventually flow on to customers through lower prices. This is our standard approach for the metropolitan utilities we regulate.

### 4.3.6 Corporate costs

We made a draft decision:

12 To broadly accept Essential Water's proposed approach to calculating corporate operating costs, but apply the allocation rates recommended by our expenditure consultant, Aither.

We recommend

1 That Essential Energy review and revise its approach to forecasting and allocating corporate operating costs to Essential Water for the next pricing review.

We have broadly accepted Essential Water's proposed approach to calculating corporate operating costs – that is, as a percentage of total direct operating and capital expenditure for water and sewerage services.[48] However, we have not accepted its proposal to maintain the percentage allocation rate at 18% per year over the 2019 determination period.[49]

Our expenditure review consultant, Aither, noted that Essential Water's proposed allocation rate of 18% per year appeared to be based on IPART's 2014 Determination.[50] It also found although Essential Water's proposal indicated that efficiencies in its wider business had resulted in lower overall costs, this was not evident in its proposed corporate operating costs.[51]

Aither recommended:

1. That Essential Water's approach of calculating corporate operating expenditures as a percentage of direct expenditures is reasonable, but

46 IPART, Working Capital Allowance Policy Paper Final Report, November 2018.
47 Effluent water is not suitable for human consumption and may only be re-used under specific environmental conditions.
48 Essential Water pricing proposal to IPART, July 2018, p 146.
49 Essential Water pricing proposal to IPART, July 2018, p 147.
50 Aither, Essential Water expenditure review – Final Report, January 2019, p 69.
51 Aither, Essential Water expenditure review – Final Report, January 2019, p 69.

2. A reduced allowance for corporate operating costs (by decreasing the allocation percentage by 0.5 percentage points each year) would be appropriate. This is because there was a lack of information in Essential Water's submission regarding its forecast corporate operating costs, so Aither could not assess whether the amount being allocated to the Essential Water business was efficient.[52]

Aither also recommended that Essential Water should undertake a more robust approach to forecasting its corporate operating costs going forward. Specifically, Aither recommended that Essential Water should undertake a bottom-up assessment of its corporate related functions to better establish its forecast operating cost needs:

> Future corporate overhead costs should not simply be based on a blanket application of a pre-determined allocation rate and applied to forecast direct costs, because a pre-determined allocation rate has no relationship with actual corporate overhead costs.[53]

Aither's views on this issue echoed those our expenditure review consultants for the 2014 Determination.[54]

We have accepted Aither's recommendations and as such have applied loadings of 17.5% for 2019-20, 17% for 2020-21 and 16.5% for 2021-22 to all direct operating and capital expenditure for both water and sewerage. We recommend that Essential Energy should continue to pursue efficiencies in its corporate operating costs and identify a more accurate way of attributing corporate overheads to Essential Water at its next pricing review.

Essential Water also proposed to include, for the first time, corporate capital expenditure (also known as non-system assets) as part of its RAB.[55] We have also largely accepted this proposal (see Chapter 6 for details).

Table 4.3 below sets out our draft decision on corporate operating costs (allocated across operating and capital expenditure). The difference between Aither's recommended corporate overheads and our draft decision reflects the different decisions on direct capital and operating expenditure allowances (see Chapters 5 and 6 for details).

52 Aither, Essential Water expenditure review – Final Report, January 2019, p 69.
53 Aither, Essential Water expenditure review – Final Report, January 2019, p 66.
54 SKM, Strategic Management Overview and Review of Operating and Capital Expenditure for Essential Water's water and sewerage business in Broken Hill – Final Report, January 2014, pp. 104-105.
55 Essential Water pricing proposal to IPART, July 2018, Metro Water Model.

**Table 4.3 IPART's draft decision on Essential Water's corporate overheads ($2018-19, excluding consequential works)**

| $million | 2019-20 | 2020-21 | 2021-22 | Total 2019-22 |
|---|---|---|---|---|
| **Essential Water proposed** | | | | |
| Capital expenditure | 2.1 | 3.1 | 2.7 | 7.9 |
| Operating expenditure | 2.2 | 2.1 | 2.1 | 6.5 |
| Total | **4.3** | **5.2** | **4.9** | **14.4** |
| **Aither recommended** | | | | |
| Capital expenditure | 1.7 | 1.0 | 0.7 | 3.5 |
| Operating expenditure | 1.8 | 1.7 | 1.6 | 5.2 |
| Total | **3.5** | **2.7** | **2.4** | **8.6** |
| **IPART's draft decision** | | | | |
| Capital expenditure | 1.7 | 1.0 | 1.6 | 4.3 |
| Operating expenditure | 1.8 | 1.8 | 1.7 | 5.3 |
| Total | **3.6** | **2.8** | **3.3** | **9.6** |

**Note:** Columns may not sum due to rounding.

**Source:** Essential Water pricing proposal to IPART, July 2018, pp 121, 140; Essential Water Expenditure Review Final Report, Aither, January 2019, p71.

## 4.4 Comparison of IPART's draft NRR with Essential Water's proposal

As Table 4.4 sets out, our draft total NRR for the 3-year determination period is $152.9 million. This comprises of:

- $63.8 million for maintaining Essential Water's existing network (13% less than Essential Water's proposal of $73.4 million)
- $3.5 million for consequential works (compared to Essential Water's proposal that costs be funded by the Government or passed through to customers), and
- $85.6 million for bulk water transportation services via the Broken Hill Pipeline (compared to Essential Water's proposal that costs be funded by the Government or passed through to customers).

Essential Water did not include the bulk water transportation costs of the Pipeline and consequential works in its proposal.[56] However, it proposed to pass through these costs to customers if they were not funded by the NSW Government.[57]

56 Essential Water pricing proposal to IPART, July 2018, pp 25, 18.
57 Essential Water pricing proposal to IPART, July 2018, p 59.

**Table 4.4 IPART's draft notional revenue requirement compared to Essential Water's proposal ($2018-19)**

| $millions | 2019-20 | 2020-21 | 2021-22 | Total 2019-22 |
|---|---|---|---|---|
| **Essential Water's proposal (excluding Pipeline transportation costs and consequential works costs)** | | | | |
| Essential Water's proposal | 24.2 | 23.9 | 25.3 | 73.4 |
| **IPART's draft decision on existing network costs (A)** | **20.9** | **21.2** | **21.6** | **63.8** |
| Difference | *-3.3* | *-2.6* | *-3.7* | *-9.6* |
| **IPART's draft decision** | | | | |
| Pipeline transportation costs **(B)** [a] | 28.5 | 28.6 | 28.5 | 85.6 |
| Consequential works costs **(C)** [b] | 0.8 | 1.1 | 1.6 | 3.5 |
| **Total IPART draft decision (A+B+C)** | **50.2** | **50.9** | **51.7** | **152.9** |

[a] Transportation costs via the Broken Hill Pipeline have been taken from the concurrent WaterNSW price review, and are passed through to Essential Water as operating costs.

[b] These values represent the NRR for our recommended consequential works capital expenditure and operating costs, and include a tax allowance and allowance for working capital.

**Note:** Totals may not add due to rounding.

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

The main reasons for the difference between the existing network costs in our draft NRR and Essential Water's proposed existing network costs are that we have allowed for:

- Lower efficient operating expenditure (-$6.1 million) due to reductions in labour, materials, hire services and electricity costs, and ongoing efficiency improvements (see Chapter 5), and
- Lower return on capital (-$2.1 million) due to a lower WACC of 4.2% compared with Essential Water's proposed declining WACC of 4.5% to 4.1%, and lower efficient forecast capital expenditure excluding the cost of the consequential works (see Chapter 6).

## 4.5 Essential Water's revenue from tariffs and the NSW Government's funding contribution

The next step in our approach to determining prices is to decide how Essential Water's notional revenue requirement would be recovered.

### We made a draft decision:

13 To set Essential Water's prices for water and sewerage services, trade waste, miscellaneous and ancillary services to recover the revenues set out in Table 4.5 from customers over the 3-year determination period.

### We recommend

2 That the NSW Government fund the difference between the total revenue to be recovered from customers and the total NRR via a direct contribution to Essential Water.

Our draft decision reflects our forecast that prices for water and other services (plus 50% of Essential Water's forecast non-regulated revenue) would recover $75.1 million over the 3-year determination period.

We have then recommended that the difference of $77.8 million between revenues recovered from customers and the NRR should be funded by the NSW Government, as a direct payment to Essential Water. When making this recommendation, we have considered the NSW Government's funding commitment to subsidise the cost of the Pipeline such that end use prices for customers would not increase in real terms as a result of the Pipeline.

**Table 4.5 IPART's draft decision on how Essential Water's revenue is to be recovered ($ millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total |
|---|---|---|---|---|
| Revenue from water and sewerage tariffs | 24.6 | 24.5 | 24.5 | 73.6 |
| Non-regulated revenue | 0.0 | 0.0 | 0.0 | 0.0 |
| Trade waste revenue | 0.4 | 0.4 | 0.4 | 1.1 |
| Miscellaneous and ancillary services revenue | 0.1 | 0.1 | 0.1 | 0.3 |
| NSW Government contribution | 25.1 | 25.9 | 26.8 | 77.8 |
| Essential Water's total revenue | **50.2** | **50.9** | **51.7** | **152.9** |

**Note:** The amounts shown for the NSW Government contribution are net of any tax implications. The NSW Government contribution amount is effectively calculated as a residual from our draft decision on Essential Water's NRR *less* revenue from tariffs. Non-regulated revenue is $0.02 million per year, and totals $0.05 million from 2019-22.

We have maintained the price of water services, in real terms, for all residential customers in Broken Hill such that water bills would increase by inflation only over the 2019 determination period. However, we have also updated our sewerage price structures to remove cross-subsidies, which means that for the majority of customers, water and sewerage bills would increase by less than inflation over the 2019 determination period.

For chlorinated and untreated water (pipeline) customers, water bills would increase in real terms due to our draft decision to increase their usage charges to better reflect Essential Water's costs in providing these services (however, these costs are unrelated to the Pipeline transportation costs).

For the mines, we have maintained our current approach for setting its water charges (see section 8.7):

1. We first determined the mines' share of Essential Water's water revenue requirement, based on the mines' share of total water revenue over the 2015-18 period.
2. We then calculated the revenue that would have been recovered from maintaining 2018-19 prices for **all customers** over the 2019 determination period. We multiplied the mines' share of historical revenue (in step 1) to this revenue, to set the total water revenue recovered from the mines over the 2019 period.
3. We then set water usage prices at the same price as for other customers and calculated the expected revenue from usage charges using forecast water sales.
4. Lastly, we set service prices to recover the remainder of the mines' share of water revenue.

Applying this approach has resulted in an increase in the mines' water bills in real terms. However, this increase is not due to the Pipeline. Rather, it is aimed at ensuring that the mines pay their cost-reflective share of efficient underlying water network costs, excluding the efficient bulk water transportation costs of the Pipeline.

Chapter 8 and Chapter 9 contain further detail on our draft decisions on price structures and on prices, incorporating the NSW Government's funding contribution.

# 5 Allowance for operating expenditure

This chapter sets out our assessment of Essential Water's efficient level of operating expenditure. As discussed in Chapter 4, it is our view of the efficient level of operating costs Essential Water will incur in providing its services over the 2019 determination period. These costs include labour, energy, hire services, energy, materials, plant and fleet.

To inform our draft decision on operating expenditure, we engaged Aither to review the efficiency of Essential Water's proposed operating expenditure.

This chapter also includes an overview of how we established Essential Water's costs for accessing water from the Pipeline. These costs are about three quarters of Essential Water's operating expenditure allowance and is the largest change to its NRR over the 2019 determination period.

## 5.1 Summary of IPART's draft decision

### We made a draft decision

14 To set the efficient level of Essential Water's operating expenditure as shown in Table 5.1.

**Table 5.1 IPART's draft decision on Essential Water's efficient operating expenditure ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total 2019-22 |
|---|---|---|---|---|
| **Essential Water's proposal** | | | | |
| Water | 9.5 | 8.9 | 9.0 | 27.4 |
| Sewerage | 2.9 | 2.8 | 2.9 | 8.6 |
| Corporate overheads | 2.2 | 2.1 | 2.1 | 6.5 |
| Total | **14.6** | **13.8** | **14.0** | **42.5** |
| **Aither recommended** | | | | |
| Water | 8.1 | 7.9 | 7.8 | 23.8 |
| Sewerage | 2.2 | 2.2 | 2.2 | 6.6 |
| Corporate overheads | 1.8 | 1.7 | 1.6 | 5.2 |
| Total | **12.1** | **11.9** | **11.6** | **35.6** |
| **IPART's draft decision (excluding the Pipeline and consequential works)** | | | | |
| Water | 8.3 | 8.1 | 8.0 | 24.4 |
| Sewerage | 2.3 | 2.2 | 2.2 | 6.7 |
| Corporate overheads | 1.8 | 1.8 | 1.7 | 5.3 |
| Total | **12.4** | **12.1** | **11.9** | **36.4** |
| **IPART's draft decision (including the Pipeline and consequential works)** | | | | |
| Water | 36.8 | 36.6 | 36.3 | 109.7 |
| Sewerage | 2.3 | 2.2 | 2.2 | 6.7 |
| Corporate overheads | 1.8 | 1.8 | 1.7 | 5.3 |
| Total | **40.9** | **40.6** | **40.2** | **121.8** |

**Note:** Columns may not sum due to rounding.

**Source:** Essential Water AIR, September 2018; Essential Water Expenditure Review Final Report, Aither, January 2019; IPART analysis.

Our draft decision is to set Essential Water's efficient operating expenditure allowance at $121.8 million over the 2019 determination period, which reflects:

- $36.4 million for Essential Water to maintain its existing network
- $0.3 million for its consequential works, and
- $85.1 million for bulk water purchases.

From mid-2019, Essential Water will access the majority of its bulk water from the Pipeline. The costs of transporting water through the Pipeline will become a recurring operating expense for Essential Water.

Essential Water proposed operating costs of $42.5 million, which only included the costs of maintaining its existing network. It did not include bulk water transportation costs from the Pipeline in its operating expenditure forecasts.

We have reduced Essential Water's operational expenditure for maintaining its existing network by a total of $6.1 million over the 2019 determination period, including labour, hire services, materials and electricity (see discussion in Section 5.3).

We have also included operating expenditure for consequential works, which was excluded from Essential Water's proposed prices. To calculate operating expenditure for consequential works, we used information provided in Essential Water's business case, which stated that operational expenditure is 1.3% of direct consequential works capital expenditure. Therefore, we have added $0.3 million to operating costs over the 2019 determination period.

WaterNSW will pass on the costs of supplying bulk water through the Pipeline to Essential Water. Therefore, these bulk water costs are included as operating expenditure in Essential Water's NRR. As discussed in Chapter 4, we have recommended that $78 million of Essential Water's total costs over the 2019 determination period should be recovered via a contribution from the Government – to reflect its commitment that end prices would not increase in real terms as a result of the Pipeline.

## 5.2 Essential Water's operating expenditure during the 2014 determination period

Essential Water's actual direct operating expenditure for the 2014 determination period was $55.7 million (see Table 5.2). This is $6.1 million (12%) more than IPART's allowance in the 2014 Determination of $49.6 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.[58]

Essential Water forecasts that it will spend $14.1 million on operating expenditure in 2018-19. We did not set an allowance for 2018-19 as it was beyond the end of the 2014 determination period.

**Table 5.2 Essential Water's historical operating expenditure, excluding corporate overheads ($millions, $2018-19)**

| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total 2014 period | 2018-19 |
|---|---|---|---|---|---|---|
| Actual/ Forecast | 11.1 | 13.5 | 14.0 | 17.0 | 55.7 | 14.1[a] |
| IPART allowance | 12.6 | 12.4 | 12.5 | 12.1 | 49.6 | N/A |
| Difference | -1.4 | 1.1 | 1.5 | 4.9 | 6.1 | N/A |

**a** Forecast

**Note:** Columns may not sum due to rounding.

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

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

## 5.3 Essential Water's proposed operational expenditure

Table 5.3 presents Essential Water's proposed operating expenditure by component. Most components are expected to increase by between 0% and 11% between 2018-19 and 2022-22 in real terms, except for energy and corporate overheads, which are estimated to fall by 60% and 16% respectively.

Essential Water's proposed total operating expenditure is $42.5 million over the 3-years to 2021-22. Excluding corporate overheads, it is about $12 million per year on average, which is about 12% lower per year compared with its 2014 Determination.

**Table 5.3 Essential Water's proposed operating expenditure components (excluding pipeline costs and consequential works) ($millions, $2018-19)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2022-22 |
|---|---|---|---|---|---|
| Labour | 5.9 | 6.6 | 6.0 | 6.0 | 0% |
| Contractors | 1.0 | 1.0 | 1.0 | 1.0 | 3% |
| Materials | 2.1 | 2.2 | 2.1 | 2.1 | 4% |
| Energy | 3.9 | 1.4 | 1.4 | 1.5 | -60% |
| Licence fees | 0.4 | 0.3 | 0.3 | 0.4 | 4% |
| Fleet | 0.8 | 0.9 | 0.9 | 0.9 | 11% |
| Desalination plant | 0.1 | 0.0 | 0.0 | 0.0 | -100% |
| Corporate Overheads | 2.5 | 2.2 | 2.1 | 2.1 | -16% |
| **Total** | **16.6** | **14.6** | **13.8** | **14.0** | **-16%** |

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

**Source:** Essential Water annual information return, July 2018.

### Essential Water's proposal included some cost savings from the Pipeline

Essential Water proposed some 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 cooperate overheads between Essential Energy's water and energy businesses. [59]

However, some of these cost savings would be offset by increased pumping costs for Essential Water's portion of the Broken Hill pipeline.

[59] Essential Water pricing proposal to IPART, July 2018, pp 139-141.

### Other stakeholder comments

In its submission, the Broken Hill Darling River Action Group considered that Essential Water's proposed operating expenditure savings should be larger than proposed based on the reduced costs from decommissioning the Menindee Pipeline, Imperial Lake and potentially Umberumberka Reservoir.[60]

We agree that decommissioning the Menindee pipeline and pump stations will reduce Essential Water's labour and electricity costs. We consider that Aither's recommended allowance for labour costs adequately includes any cost savings from changes in operational and maintenance conditions.

## 5.4 Reduce Essential Water's operational expenditure by $6.1 million (excluding bulk water and consequential works costs)

We have largely accepted Aither's recommendations on operating expenditure, having considered both Aither's recommendations and Essential Water's response to Aither's draft report. The only exception is that we have made a draft decision to provide Essential Water a slightly larger allowance for materials costs than recommended by Aither. The reasons for our draft decisions on each category of operating cost are discussed in the sub-sections below.

Table 5.4 summarises the adjustments we have applied to Essential Water's proposed operating expenditure for the 2019 determination period.

**Table 5.4 Essential Water's proposed operating expenditure ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total 2019-22 |
|---|---|---|---|---|
| **Essential Water proposed** | 14.6 | 13.8 | 14.0 | 42.5 |
| Reduced labour cost | -1.4 | -0.9 | -1.1 | -3.4 |
| Reduced materials cost | -0.2 | -0.1 | -0.1 | -0.4 |
| Reduced hire services cost | -0.3 | -0.3 | -0.3 | -0.9 |
| Increased electricity costs | 0.1 | 0.1 | -0.1 | 0.1 |
| Efficiency improvement | -0.1 | -0.1 | -0.2 | -0.3 |
| Reduction in corporate overheads | -0.4 | -0.3 | -0.5 | -1.2 |
| **IPART's draft decision** | 12.4 | 12.1 | 11.8 | 36.4 |
| % Reduction to Essential Water's proposal | -15% | -12% | -15% | -14% |

**Note:** Columns may not sum due to rounding.

**Source:** Essential Water AIR, September 2018; Essential Water Expenditure Review Final Report, Aither, January 2019; IPART analysis.

Overall, our draft decision represents a 14% reduction to Essential Water's proposal over the 2019 determination period.

60 Broken Hill Darling River Action Group, *Submission to the Issues Paper – Review of prices for Essential Energy's water and sewerage services in Broken Hill from 1 July 2019*, October 2018, p 2.

### 5.4.1 Reduce labour costs by $3.4 million

Essential Water's labour allowance provides for the efficient employee costs for maintaining and running its water and sewerage network (labour for administrative functions is included in corporate operational expenditure). Essential Water proposed direct labour costs of $18.6 million ($2018-19) over the 3-years to 2021-22.

Essential Water based its proposal on forecast expenditure in 2018-19 and then escalated labour expenditure by 1.5% per year in nominal terms. This forecast leads to a small decrease in operational costs each year of the determination period in real terms.

Essential Water submitted that it was proposing a reduction of four full-time equivalent (FTE) employees between 2019-22, as a result of decommissioning the Menindee Pipeline. However, it is proposing that other labour costs such as salaries and overtime would remain largely constant. Essential Water also submitted that due to the small size of its business, employees often worked across multiple areas, which made it difficult to forecast how operational changes would impact head counts and hence labour costs.

#### Aither's recomendation

Aither raised several concerns with Essential Water's labour forecasts including:

- It was not evident that Essential Water's proposed labour costs incorporated any reductions in employee numbers, or overtime, due to the Menindee pipeline decommissioning.
- Essential Water's large proposed capital program would be expected to place downward pressure on operational labour costs as labour is capitalised for delivering these projects. That is, as Essential Water has proposed a large capital expenditure program (particularly once consequential works are included), this implies a higher proportion of labour would be allocated to capital expenditure, and a lower proportion allocated to operating expenditure. However, this was not evident in Essential Water's proposal.[61]
- Essential Water's sewerage labour forecasts for 2018-19 varied by 32% over a three month period, raising doubts about the reliability of Essential Water's approach to forecasting labour costs.[62]

To address uncertainties in Essential Water's forecasts for 2018-19, Aither first used Essential Water's actual 2017-18 water and sewerage labour costs as a base for its forecasts.

Aither then recommended reducing Essential Water's proposed labour costs by $4.5 million over three years to account for Essential Water's expected FTE reductions, and a 5% reduction in overtime due to the Menindee pipeline being decommissioned. However, this was partially offset by an increase of $100,000 in 2020-21 to account for redundancy payments. Aither then accepted Essential Water's proposal to escalate labour costs by 1.5% per year in nominal terms.

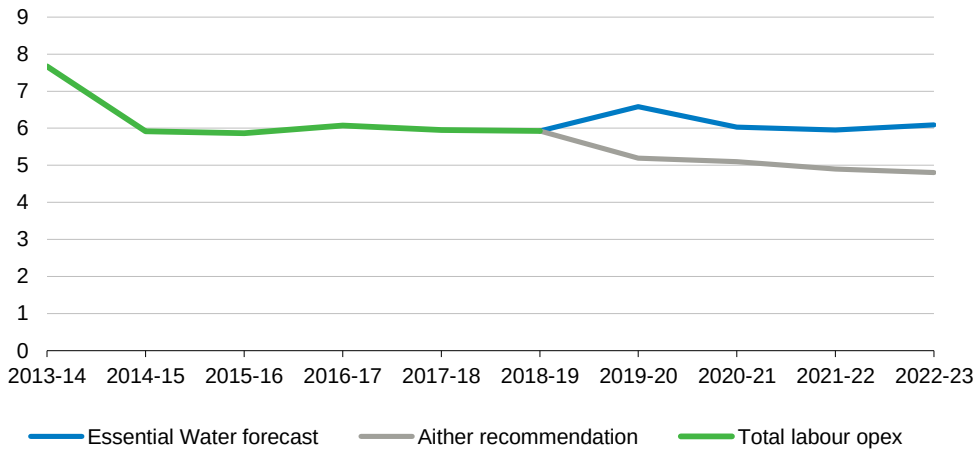
61 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 46.

62 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 47.

### IPART's draft decision

We accept Aither's recommendations (see Figure 5.1 below). We agree with using 2017-18 as a base year, and that the labour cost savings due to decommissioning the Menindee pipeline should be included in its forecast expenditure.

**Figure 5.1 Historical and proposed labour operating expenditure from 2013-14 to 2022-23 ($ millions, 2018-19)**




**Source:** Essential Water AIR, September 2018; Essential Water Expenditure Review Final Report, Aither, January 2019, p51.

## 5.4.2 Reduce materials costs by $0.4 million

Essential Water proposed materials costs of $6.4 million over the 2019 determination period, or $2.1 million per year on average. This is $0.4 million (21%) more per year on average than Essential Water's actual materials expenditure over the 2014 determination period after accounting for inflation. Essential Water considered these increases were driven by an increase in the per-unit cost of chemicals, and maintenance of the water and sewerage networks. It also considered it was appropriate to base its cost projections on 2017-18 costs as production costs for chemicals have increased in recent years.

### Aither's recommendation

Aither used average actual materials costs over the period 2014-19 as a basis for setting materials costs (given that changes in water consumption year-to-year will introduce some volatility into these forecasts). It then assumed that these costs would remain constant in real terms over the determination period. Aither found Essential Water's proposed 21% increase to be unjustified and inefficient.

### IPART's draft decision

In its response to Aither's draft report, Essential Water provided further breakdown of forecast materials costs, which showed that its costs were driven by an increase in the per unit cost of chemicals, and maintenance of the water and sewerage networks.

We accept Essential Water's argument that materials costs have increased and that 2017-18 is an appropriate year to base its chemical costs on. In addition, Essential Water's actual water consumption in 2017-18 (5,870 ML) is similar to our forecast water consumption in 2019-20 (5,967 ML). Therefore, we have used 2017-18 materials costs as a basis for setting materials costs, and have held this number constant in real terms over the 2019 determination period.

### 5.4.3 Reduce hire services by $0.3 million

In addition to labour costs, Essential Water also incurs costs for hire services and consultants. Essential Water proposed to spend $3.0 million on hire services or $1.0 million per year on average, over the 2019 determination period. This is $0.3 million (or 25%) higher per year (on average) compared with the 2014 Determination. Essential Water attributes these extra costs to additional consulting costs required for complying with regulatory requirements such as its IPART pricing submission and preparing its mandated Integrated Water Cycle Management (IWCM) plan. It also noted additional planning costs for upcoming capital projects.

#### Aither's recommendation

Aither considered Essential Water's proposed increase to be unjustified. It noted that although there had been historical spikes in hire service costs related to specific projects, these projects were not ongoing and the expenditure Essential Water was proposing was well above the historical trend. Aither recommended reducing hire services costs to reflect the historical average over the 2014 determination period.

#### IPART's draft decision

We have accepted Aither's recommendation as we did not find Essential Water's proposal to be well substantiated. We note that where capital expenditure projects are required, but have not yet been fully scoped, Aither has included an allowance for project planning, including completing detailed businesses cases. This includes the Wills Street Sewerage Treatment Plant and the consequential works for Stephens Creek.

Further, we note that according to the Department of Industry's IWCM Strategy Check List, local water utilities are required to update their IWCM and a Strategic Business Plan every eight years. This means that the historical costs over the previous determination included the costs of updating its Strategic Business Plan, and should be reflective of its costs to update its IWCM over the 2019 period.

### 5.4.4 Broadly accept Essential Water's electricity costs

Essential Water requires significant volumes of electricity to operate its network, including pump stations and treatment plants. Essential Water's electricity needs will be different in the 2019 determination period compared to the 2014 determination period - for example, it will no longer need to operate pump stations along the Menindee pipeline but will instead need to pump water along the last 21 km section of the Pipeline.

Essential Water proposed to spend $4.3 million on electricity over the 2019-22 period, or $1.4 million per year on average. This is $1.3 million (or 47%) per year less than the average

over the 2014 determination period. Specifically, Essential Water proposed relatively constant electricity costs for 2019-20 and 2020-21, and then an 11% increase for 2021-22.

Whilst Essential Water has forecast its energy demand to remain relatively constant over the 2019 determination period, it submitted that it will have a contract renewal in 2020 and is expecting increases in electricity prices of around 7% per year based on Australian Energy Market Operator (AEMO) forecasts.

Aither's Recommendation

Overall, Aither recommended a small increase of $0.1 million to Essential Water's proposed costs over the 2019 determination period.

Essential Water forecast that electricity volumes would be relatively constant over the 2019 determination period. Aither accepted Essential Water's forecast electricity volumes as being reasonable but did not accept Essential water's forecast increase in electricity prices for 2021-22. As such, Aither has recommended an alternative forecast for electricity costs in real terms, based on Australian Energy Market Commission (AEMC) forecast prices for wholesale and regulated networks over the determination period. Aither also included an additional allowance for small sites,[63] which were not included in Essential Water's pricing proposal.

IPART's draft decision

We have accepted Aither's recommendations. We also consider that electricity costs for the new bulk water pump station will offset many of the efficiencies gained from decommissioning the Menindee pipeline and therefore Aither's electricity cost forecast is appropriate.

### 5.4.5 Include efficiency improvements of $0.3 million

Aither's recommendation

Aither recommended a 1% efficiency adjustment to non-labour direct expenditure in each year of the determination. This is because its recommended reductions to specific operating expenditure items are designed to establish baseline for operating expenditure, and do not include productivity improvements. The 1% efficiency adjustment is intended to explicitly capture future efficiencies, including expected efficiencies from moving to the new Pipeline. Aither did not apply an efficiency adjustment to labour expenditure, as Essential Water forecast that wages would increase in nominal terms by 1.5% per year, and thus incorporated a real reduction in per unit labour costs.

IPART's draft decision

We support Aither's recommendation of a 1% annual efficiency adjustment to reflect productivity improvements over time.

63 Small sites other than the large pumping stations, booster stations and treatment plants that Essential Water operates.

### 5.4.6 Reduce corporate operating costs by $1.2 million

Essential Water proposed $6.5 million of corporate operating costs over the 3-year period to 2021-22. Chapter 4 discussed Essential Water's approach to calculating corporate operating costs, Aither's recommendation and our overall draft decision on corporate overheads.

As discussed in Chapter 4, we have applied corporate overhead loadings of 17.5% for 2019-20, 17% for 2020-21 and 16.5% for 2021-22 to all direct operating expenditure. This results in an overhead allowance of $5.3 million over the 2019 determination period, and reflects our draft decisions to:

- Reduce direct operating expenditure, and
- Reduce the percentage loading applied to direct operating expenditure.

### 5.4.7 Include $85.1m for bulk water transportation services

From mid-2019, Essential Water will source the majority of its bulk water from the Murray River to Broken Hill pipeline. We have determined the total NRR based on full efficient costs, including Pipeline transportation costs and consequential works, consistent with our approach to setting prices as outlined in Section 1.1.5.

IPART is establishing the maximum prices WaterNSW can charge Essential Water for bulk water transportation services in our concurrent review.[64] These prices will recover WaterNSW's efficient operational costs as well as a return on (and of) capital.

The Pipeline transportation services would make up about three quarters of Essential Water's annual operating costs and would have major impacts on customers if passed on in full. However, we have considered the Government's commitment to fund the efficient costs of the Pipeline such that end prices do not increase in real terms. Therefore, we have recommended the difference between the amount that is recovered from prices (ie, from our draft decision to not increase prices in real terms as a result of the Pipeline) and Essential Water's total NRR as a Government contribution (discussed in Chapter 4).

64 IPART, Review of prices for WaterNSW Murray River to Broken Hill Pipeline from 1 July 2019 – Draft Report, April 2019.

# 6 Prudent historical and efficient forecast capital expenditure

This chapter outlines our assessment of Essential Water's prudent historical and efficient forecast capital expenditure. It discusses:

- Essential Water's actual capital expenditure during the 2014 determination period.
- Essential Water's proposed capital expenditure for the 2019 determination period including:
  - Its major proposed capital works projects
  - Its proposed approach to pipeline and consequential works, and
  - Changes to its long term water operations.
- Our draft decisions on Essential Water's proposal.

Under the building block method, capital costs are not recovered as they are expended. Instead, the prudent historical and efficient forecast capital expenditure is added to the Regulatory Asset Base (RAB) and recovered over time through allowances for a return on assets and regulatory depreciation (see Chapter 4).

As with operating expenditure, we engaged consultants Aither to review Essential Water's historical and proposed capital expenditure and recommend the prudent historical and efficient forecast amount to include in the Regulatory Asset Base (RAB). Aither also reviewed Essential Water's performance against output measures over the 2014 determination period.

We also considered submissions from stakeholders in making our draft decisions.

## 6.1 Summary of our draft decisions

We have made draft decisions to:

- Largely accept Essential Water's historical capital expenditure over the 2014 determination period as prudent, with small reductions to capital expenditure in 2017-18 and 2018-19 only.
- Include an allowance of $53.7 million for capital expenditure over the 2019 determination period. This reflects our draft decisions to allow:
  - $33.8 million for capital expenditure to maintain Essential Water's existing network over the next three years, including corporate overheads and non-system assets (a 39% reduction from Essential Water's proposal).
  - $19.9 million for capital expenditure for consequential works, over the 3-year period. Essential Water proposed $46.8 million for these projects over the same period, but did not include these in its proposed prices.
- Accept Essential Water's proposal to create a new RAB category for corporate capital costs.

- Accept Essential Water's proposed asset lives for water and sewerage assets, and to adopt slightly longer asset lives for corporate assets.
- Retain the current output measures of Essential Water's performance. However, we recommend that Essential Water's output measures provide a quantitative assessment of its performance in future reviews.

To make our capital expenditure decisions, we first considered Essential Water's historical capital expenditure over the 2014 determination period, and then considered the capital programs it has proposed for the 2019 determination period.

To aid us in this assessment, we engaged Aither to undertake a review of Essential Water's historical and proposed capital expenditure, including a strategic review of the Essential Water's long-term investment plans, asset management systems and practices. In undertaking their review, Aither applied our prudency and efficiency tests to Essential Water's capital expenditure. See Box 6.1 for a summary of these tests.

**Box 6.1 Prudence and efficiency tests**

Both the prudence and efficiency tests look at, at a given point in time, whether the expenditure is economically efficient.

**Prudence test**

This test examines Essential Water's historical capital expenditure only. It assesses whether the decision to invest in an asset was one that Essential Water, acting prudently, would have been expected to make in the circumstances existing at the time. The test assesses both:

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

**Efficiency test**

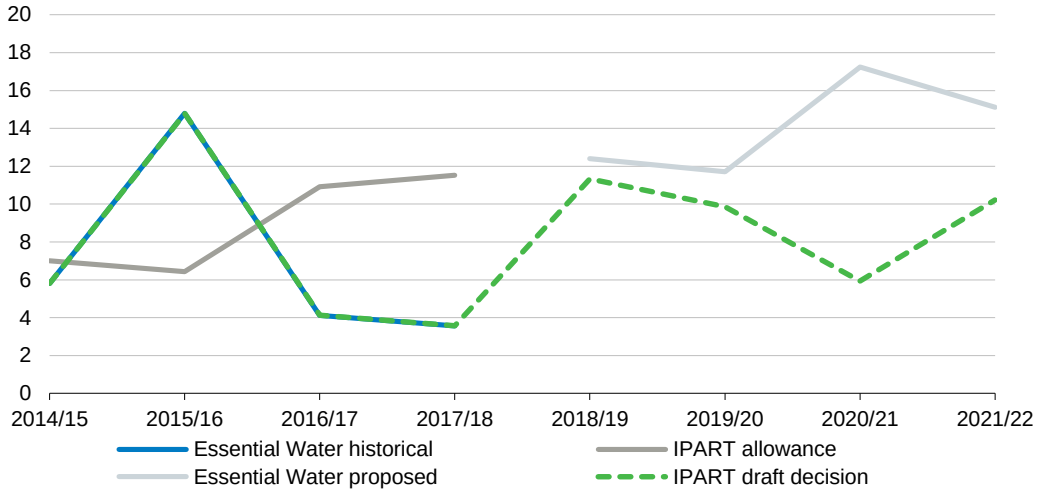
This test examines whether Essential Water's proposed expenditure represents the best and most cost effective way of delivering the monopoly services.

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.

In reviewing expenditure, Aither applied a prudence test to historical capital expenditure, and an efficiency test to proposed operating and capital expenditure.

We have considered Aither's review and recommendations in forming our draft decisions on prudent historical and efficient forecast capital expenditure. Our draft decisions are summarised in Figure 6.1.

**Figure 6.1 Essential Water's past and forecast total capital expenditure excluding consequential works ($ millions, $2018-19)**




## 6.2 Capital expenditure over the 2014 determination period

### We made a draft decision

15 To set Essential Water's prudent level of past capital expenditure to be included in the Regulatory Asset Base (RAB) as set out in Table 6.1.

**Table 6.1 IPART's draft decision and Essential Water's proposed prudent capital expenditure for the 2014 determination period ($millions, $nominal)**

| | 2014-15 Actual | 2015-16 Actual | 2016-17 Actual | 2017-18 Actual | Total 2014-18 | 2018-19 Forecast |
|---|---|---|---|---|---|---|
| **Essential Water's proposal** | | | | | | |
| Water | 3.2 | 12.5 | 1.7 | 2.4 | 19.8 | 9.1 |
| Sewerage | 2.2 | 1.4 | 2.2 | 1.0 | 6.9 | 3.3 |
| Corporate overheads[a] | 0.9 | 0.6 | 1.7 | 0.4 | 3.6 | 2.2 |
| Non-system assets | 0.0 | 0.0 | 0.0 | 1.9 | 1.9 | 1.6 |
| Total | 6.3 | 14.4 | 5.7 | 5.8 | 32.2 | 16.2 |
| **IPART's draft decision** | | | | | | |
| Water | 3.2 | 12.5 | 1.7 | 2.4 | 19.8 | 8.1 |
| Sewerage | 2.2 | 1.4 | 2.2 | 1.0 | 6.9 | 3.3 |
| Corporate overheads[a] | 0.9 | 0.6 | 1.7 | 0.4 | 3.6 | 2.0 |
| Non-system assets | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 |
| Total | **6.3** | **14.4** | **5.7** | **3.8** | **30.3** | **15.0** |

[a] Essential Water's prudent capital expenditure on non-system assets has been proportionally allocated to the water and sewerage RABs for 2018-19.

**Note:** Columns may not sum due to rounding.

**Source:** Essential Water AIR, September 2018; Essential Water Expenditure Review Draft Report, Aither, January 2019, p32.

Under the building block framework, prudent historical and efficient forecast capital expenditure will be rolled into Essential Water's RAB to be recovered from customers over time.

We reviewed the prudency of Essential Water's capital expenditure over the 2014 determination period, as well as the efficiency of forecast expenditure for 2018-19.[65]

During the 2014 determination period, Essential Water delayed several significant capital projects, which lead to a significant capital underspend compared to IPART's allowance (see Table 6.2). Essential Water stated these delays were due to reallocation of expenditure to the emergency drought works.

During 2015, worsening drought conditions lead to increased salinity in the Darling River and Menindee Lakes. On 19 June 2015, the Minister for Industry, Resources and Energy directed Essential Water to construct, operate and maintain the necessary infrastructure to maintain drinking water quality.

The NSW Government provided $13.8 million directly to Essential Water for the emergency drought works. These works included constructing a reverse osmosis desalination plant at the Mica Street Water Treatment Plant, as well as a pipeline and evaporating pond for the brine produced.

65 Because 2018-19 expenditure is forecast, we consider the efficiency of this expenditure at this review. At the next review in 2022, we will consider the prudency of 2018-19 expenditure.

In determining Essential Water's prudent capital expenditure for the 2014 determination period, we have netted off cash capital contributions for emergency drought works (exclusive of the tax payable on these grants) from the total prudent expenditure incurred. Including the amount provided by the Government for emergency drought works, Essential Water underspent its capital allowance by $7.5 million (or 22%). Excluding the drought works, Essential Water's actual capital expenditure for the 2014 determination period was $16.1 million (or 47%) less than IPART's allowance.

**Table 6.2 Essential Water's historical capital expenditure (excluding corporate overheads, $millions, $nominal)**

| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total 2014-18 | 2018-19 |
|---|---|---|---|---|---|---|
| Actual/ Forecast including emergency drought works | 5.4 | 13.8 | 3.9 | 3.5 | 26.6 | 12.4 |
| Emergency drought works | 0.0 | 7.9 | 0.6 | 0.0 | 8.6 | 0.0 |
| Actual/Forecast excluding emergency drought works | 5.4 | 5.9 | 3.3 | 3.5 | 18.1 | 12.4 |
| **IPART's 2014 Determination** | **6.5** | **6.0** | **10.4** | **11.2** | **34.2** | N/A |
| Difference including emergency works | -1.1 | 7.8 | -6.5 | -7.8 | -7.5 | N/A |
| Difference excluding emergency works | -1.1 | -0.1 | -7.1 | -7.8 | -16.1 | N/A |

**Note:** The actual capital expenditure in this table is exclusive of corporate overheads and so differs from Table 6.1. Columns may not sum due to rounding.

**Source:** Essential Water AIR, September 2018.

Aither assessed Essential Water's actual capital expenditure over the 2014-19 period as prudent, with two exceptions:

1. It did not consider that Essential Water's expenditure on non-system assets (NSAs) in 2017-18 was prudent, and that $1.9 million should be excluded from the RAB (see Section 6.6).
2. Essential Water's expenditure in 2018-19 includes $1.1 million for corrosion works at the Mica Street water treatment plant, which Aither did not consider efficient. In Aither's view, while repairs are required, they should have been avoided in the first place, as it would reasonably be expected that corrosion protection would be specified at the time of construction. Therefore, it is not efficient for customers to bear the costs of these corrosion works.

In response to Aither's draft report, Essential Water considered that it should not absorb the costs of corrosion repair, because it did all that was reasonably possible to specify the need for corrosion protection in the original project scope.[66] However, our view is that these repair costs should not be borne by customers, and that they should be borne by Essential Water or the original contractors. We also note that Essential Water are attempting to recover the costs of corrosion repairs from the original contractors.

66 Essential Water, Response to Aither's draft report, December 2018 – confidential document.

We agree with Aither's recommended adjustments to Essential Water's historical capital expenditure over the 2014-19 period.

## 6.3 Proposed capital expenditure for the 2019 determination period

### We made a draft decision

16 To set Essential Water's efficient level of capital expenditure to be included in the Regulatory Asset Base (RAB) for the 2019 determination period as shown in Table 6.3.

**Table 6.3 IPART's draft decision on Essential Water's efficient capital expenditure for the 2019 determination period ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total 2019-22 |
|---|---|---|---|---|
| Water | 21.1 | 8.1 | 3.7 | 32.9 |
| *Of which:* | | | | |
| *Existing network* | 7.7 | 3.9 | 1.5 | 13.0 |
| *Consequential works* | *13.4* | *4.3* | *2.3* | *19.9* |
| Sewerage | 2.2 | 2.1 | 8.1 | 12.4 |
| Corporate overheads | 1.7 | 1.0 | 1.6 | 4.3 |
| Non-system assets | 1.6 | 1.0 | 0.8 | 3.3 |
| **Total** | **26.6** | **12.2** | **14.2** | **53.0** |

**Note:** Columns may not sum due to rounding.

The three components of our capital expenditure allowance are discussed in turn:

- Direct capital expenditure on water and sewerage assets to maintain the existing network.
- Consequential works expenditure on water assets, as a result of the Pipeline.
- Allowances for corporate costs – the allocation of corporate overheads to capital expenditure, and the efficient level of expenditure on corporate capital expenditure (non-system assets).

## 6.4 Direct capital expenditure to maintain the existing network

Table 6.4 summarises Essential Water's proposal for direct capital expenditure, Aither's recommended expenditure allowance, and our draft decision.

**Table 6.4 IPART's draft decision on efficient capital expenditure for the 2019 determination period, excluding consequential works ($2018-19)**

| $ millions | 2019-20 | 2020-21 | 2021-22 | Total 2019-22 |
|---|---|---|---|---|
| **Essential Water proposed** | | | | |
| Water | 9.5 | 3.9 | 1.8 | 15.2 |
| Sewerage | 2.2 | 13.4 | 13.4 | 28.9 |
| Corporate overheads | 2.1 | 3.1 | 2.7 | 7.9 |
| Non-system assets | 1.6 | 1.0 | 0.8 | 3.3 |
| Total | 15.4 | 21.3 | 18.6 | 55.3 |
| **Aither recommended** | | | | |
| Water | 7.7 | 3.9 | 1.8 | 13.3 |
| Sewerage | 2.2 | 2.1 | 2.7 | 6.9 |
| Corporate overheads | 1.7 | 1.0 | 0.7 | 3.5 |
| Non-system assets | 1.6 | 1.0 | 0.8 | 3.3 |
| Total | 13.2 | 7.9 | 6.0 | 27.1 |
| **IPART's draft decision** | | | | |
| Water | 7.7 | 3.9 | 1.5 | 13.0 |
| Sewerage | 2.2 | 2.1 | 8.1 | 12.4 |
| Corporate overheads | 1.7 | 1.0 | 1.6 | 4.3 |
| Non-system assets | 1.6 | 1.0 | 0.8 | 3.3 |
| Total | 13.2 | 7.9 | 11.9 | 33.0 |

**Notes:** Columns may not sum due to rounding.

**Source:** Essential Water AIR, September 2018; Essential Water Expenditure Review Final Report, Aither, January 2019, IPART analysis.

Essential Water's proposed capital expenditure for the 2019-22 period is $55.3 million (excluding consequential works related to the Pipeline).

Our draft decision on Essential Water's efficient capital expenditure for the 2019 determination period is $33.0 million, excluding consequential works. This is $22.3 million (or 40%) less than Essential Water's proposal. This reduction mainly reflects our decisions to:

- Delay the replacement of the Wills Street sewerage treatment plant until the third year of the determination (-$16.5 million)
- Exclude corrosion works expenditure (as it is not efficient for customers to pay for these costs) and expenditure on the Stephens Creek Dam Wall rehabilitation (-$2.1 million), and
- Exclude corporate overhead costs relating to our draft reductions (-$3.6 million).

The reasons for our draft decisions on major proposed capital projects are discussed below.

### 6.4.1 Reduce Wills Street sewerage treatment plant expenditure by $16.5 million

Essential Water's largest proposed capital project was to replace the Wills Street sewerage treatment plant at a cost of $25.8 million over four years. The plant was constructed in the 1930s and Essential Water considers that the plant is nearing the end of its useful life and requires significant upgrades to comply with its environmental protection licence. Essential Water argues that constructing a new plant would avoid $20 million in remediation costs to bring the existing plant up to environmental standards.

#### Aither's recommendation

Aither recommended deferring the Wills Street sewerage treatment plant replacement to start in 2022-23 instead of 2019-20.[67] It had concerns about Essential Water's capacity to deliver its proposed capital expenditure program over the next three years. Aither noted that Essential Water's proposed expenditure for the 2019 determination period is 190% of the 2014 determination, and over 300% of the previous determination period if consequential works are included.

Essential Water's initial pricing proposal argued that works are needed to comply with NSW Environment Protection Agency (EPA) environmental requirements. However, Aither's analysis found that Essential Water has already addressed one of the two EPA requirements (regarding groundwater contamination) through existing remedial works, and has agreed with EPA on works to address the other requirement regarding stormwater control by 30 June 2019. Therefore, Aither considers that Essential Water should assess the success of the recently completed works in reducing environmental contamination, and review the scope and timing of future works.

#### IPART's draft decision

We largely accept Aither's recommendation, but with a timing adjustment to include Aither's total recommended $9.3 million expenditure allowance over the 3-year determination period, rather than over four years (see Table 6.5). In making our draft decision, we noted Aither's view that Essential Water's recent expenditure on the Wills Street sewerage treatment plant has largely addressed current EPA requirements.

**Table 6.5 Capital expenditure for the replacement of Wills St sewerage treatment plant ($2018-19)**

| $ millions | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Total 2019-22 |
|---|---|---|---|---|---|
| Essential Water proposed | 1.2 | 12.2 | 12.4 | 3.5 | 25.8 |
| Aither recommended | 1.3 | 1.0 | 2.0 | 5.0 | 4.3 |
| **IPART's draft decision** | 1.3 | 1.0 | 7.0 | - | 9.3 |
| Difference | 0.1 | -11.2 | -5.4 | - | -16.5 |

**Note:** Columns may not sum due to rounding. Figures for 2022-23 are shown as they were proposed by Essential Water, but are outside our draft determination period of 2019-22.

**Source:** Essential Water AIR, September 2018; Essential Water Expenditure Review Final Report, Aither, January 2019, p 99.

67 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 27.

In effect, this would provide an allowance for Essential Water to begin construction in the final year of the determination period (2021-22). We strongly encourage Essential Water to complete a comprehensive business case in the first two years and commence works in the third year. This adjusted profile would give Essential Water an opportunity to demonstrate its capacity to deliver.

In its response to Aither's draft report, Essential Water suggested that Wills St could be considered a 'contingent' project (a concept used by the Australian Energy Regulator). The cost of a 'contingent' project is recovered from customers only if pre-defined conditions are met. We identified advantages and disadvantages of this approach:

- Essential Water has not yet completed a business case and the project costs are uncertain. Therefore, there is a risk that customers may pay too much if the allowance we set is inefficient.
- A 'contingent' project mechanism would provide a true-up at the next determination to include the efficient cost of the project. That is, we could set a small or zero allowance for Wills St in this determination, and make an adjustment at the next determination.
- This option would be administratively more complex for both Essential Water and IPART, but could minimise risks of overpayment by customers. However, it might also reduce the incentives for Essential Water to find efficiencies in delivering the project.

On balance, our view is that a $9.3 million allowance over the 2019 determination period would allow Essential Water to proceed with replacing the treatment plant starting 2021-22, and potentially give the 2022 expenditure review sufficient information to assess the prudency and efficiency of the project.

### 6.4.2 Not recover Mica St water treatment plant corrosion works from customers

As discussed in Section 6.2, Essential Water has identified the need for remediation works at the Mica Street water treatment plant to address concrete corrosion. Essential Water proposed to include $1.8 million in repairs in the 2019 determination period in addition to the $1.1 million spent during 2018-19 (excluding corporate overheads).

#### Aither's recommendation

Consistent with its assessment of Essential Water's corrosion repairs in 2018-19, Aither considered the proposed project was not efficient because works would not have been needed if corrosion protection was installed at the time of construction. Therefore, it considered that Essential Water should not recover these costs from customers, but should absorb these costs or recover them from contractors.[68]

#### IPART's draft decision

We accept Aither's recommendation. Our view is that these repair costs are not efficient and so should not be borne by customers. Rather, they should be borne by Essential Water or the original contractors.

68 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 23.

### 6.4.3 Not include Stephens Creek dam wall rehabilitation costs

Essential Water proposed $0.3 million for 2021-22 and $0.8 million for 2022-23 (excluding corporate overheads) on Stephens Creek dam wall rehabilitation works. In its view, these works are needed to reduce the risk of dam failure, with potential risk of loss of life and assets.

#### Aither's recommendation

Aither's view was that these works are necessary and efficient.

#### IPART's draft decision

Following consultation with the Dam Safety Committee, we have decided to exclude the proposed Stephens Creek dam wall rehabilitation costs until new dam safety legislation is in place, and encourage Essential Water to review the need for the works at the next determination period.

This reflects our view that these works are not required by current dam safety requirements, and that Essential Water should wait for the new safety requirements to be implemented before proposing expenditure to address dam safety requirements.

The Dam Safety Committee has identified 15 dams in NSW that are significant risk dams under current legislation, which would require dam owners to rectify any identified deficiencies in order to address flooding risk. These 15 dams have been assessed as being in the 'intolerable zone' on the risk matrix (which plots the probability of flooding and expected lives lost).[69] Stephens Creek is not one of these dams, and there is no current mandatory requirement for additional works to address dam safety issues.

Looking forward, we understand that a new Dam Safety Act could be in place by 2019, which will be supported by associated regulations on dam safety requirements. We understand that the new regulations will focus on management systems and processes, and refer to ISO standards and ANCOLD guidelines,[70] but will not prescribe technical standards. Therefore, we consider it is unlikely that the new safety regulatory regime would represent a tightening of requirements to address dam safety issues.

## 6.5 Proposed consequential works capital expenditure

Essential Water has proposed consequential works projects to adapt its water supply network to integrate with the Broken Hill pipeline, see Box 6.2. Table 6.6 summarises Essential Water's estimated capital costs for these projects, Aither's recommended expenditure allowance, and our view of the efficient cost of consequential works.

69 Dam Safety Committee secretariat, email to IPART, 17 December 2018.

70 ANCOLD is the Australian National Committee on Large Dams, which provide technical guidelines on management of large dams.

**Table 6.6 IPART's draft decision on consequential works capital expenditure for the 2019 determination period ($2018-19)**

| $ millions | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Total 2019-22 |
|---|---|---|---|---|---|---|
| Essential Water proposed | 10.0 | 39.2 | 5.3 | 2.3 | 2.3 | 46.8 |
| Aither recommended | 0.7 | 6.6 | 4.4 | 4.3 | 5.3 | 15.3 |
| **IPART's draft decision** | 6.4 | 13.4 | 4.3 | 2.3 | N/A | 19.9 |

**Note:** Columns may not sum due to rounding. Figures for 2018-19 and 2022-23 are shown as they were proposed by Essential Water, but outside our draft determination period of 2019-22.

**Source:** Essential Water pricing submission to IPART, June 2018; Essential Water Expenditure Review Final Report, Aither, January 2019, IPART analysis.

Essential Water estimated the total capital cost for the works at $59.1 million (including overheads and contingencies) over the 2018-23 period, with an ongoing operating cost of $0.4 million per year. Over the 3-year determination period, it is $46.8 million.

Essential Water excluded consequential works from its proposed NRR, because it is seeking separate Government funding for the full cost of the works. In the event that the Government does not fund the cost of the consequential works, Essential Water has proposed a cost pass-through mechanism to recover some, or all, of these costs from customers (including operational costs). We did not accept Essential Water's proposed cost pass-through for consequential works (see Section 3.3 for further discussion).

We have not received confirmation from NSW Government regarding funding for consequential works. Therefore, we have made our own assessment of the prudency and efficient of the proposed consequential works, taking into account Aither's assessment.

We will set prices to reflect Essential Water's costs for providing water services, including efficient capital expenditure on the consequential works, less any confirmed Government subsidies or grants.

Overall, our draft decision is to allow $19.9 million for the 2019 determination period, and include $6.4 million in Essential Water's RAB for 2018-19.

**Box 6.2 Essential Water's proposed consequential works**

Essential Water has proposed consequential works projects to aintegrate its water supply network to the Broken Hill pipeline.

**Stephens Creek pump station and Rocla pipeline refurbishments ($31.5 million)**

Essential Water plans to transition Stephens Creek reservoir from Broken Hill's main water source to a back-up, which will supply the city when the Pipeline is shut down. To improve the reliability of the Stephens Creek supply system, Essential Water proposes to replace the Stephens Creek pump station and sections of the Rocla pipeline connecting the reservoir to Broken Hill.

**Replacement supply for Menindee pipeline customers ($12.3 million)**

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 pipeline. When the Menindee pipeline is decommissioned Essential Water proposes to supply the caravan park and Sunset Strip with treated water from a new pipeline from the Menindee water treatment plant (at a cost of $1.5m) and the graziers from a new gravity fed pipeline from Stephens Creek reservoir (at a cost of $10.8m).

**Mica Street water treatment plant upgrades ($2.2 million)**

Essential Water identified two major water quality risks from water pumped from the Murray River for its chlorinated and untreated water customers. Firstly, water from the Murray River is likely to be more corrosive than water from the Darling River and could cause accelerated degradation of pipes in the Essential Water network. Secondly, WaterNSW identified a risk of cyanobacteria (blue-green algae) blooms in its bulk water storage. WaterNSW proposes to use Powdered Activated Carbon (PAC) to control algae. However, residual PAC will remain in Essential Water's untreated water stream which could create additional health risks and potentially clog Essential Water's infrastructure over time.

Essential Water proposes to construct new infrastructure at Mica Street water treatment plant including:

- $CO_2$ and Lime dossing to reduce water corrosiveness, and
- Dissolved Air Flotation (DAF) filters to remove residual powdered activated carbon (PAC).

**Decommissioning the desalination plant brine pond ($10.0 million)**

Essential Water proposes decommissioning the brine evaporation pond and pipeline for the city's desalination plant, which will no longer be required once the Murray River pipeline is operational. Essential Water is leasing the land the brine pond is built on from Perilya. Once the site is remediated, the land will returned to Perilya who plan to retain the earthworks for use as a future tailings dam.

**Note:** Costs exclude corporate overheads

### 6.5.1 Stephens Creek upgrades are not consequential works

Once the Murray River pipeline becomes available Essential Water proposes to transition the Stephens Creek supply system to become a backup source. It proposes $31.5 million in capital works between 2018-19 and 2020-21, to improve the reliability of this system. This involves replacing the Stephens Creek pump station and some sections of the Rocla pipeline connecting Stephens Creek to Broken Hill.

### Aither's recommendation

Aither has recommended deferring Stephens Creek reservoir refurbishments, which were proposed by Essential Water to ensure the reliability of Stephens Creek as Broken Hill's main back-up supply.[71]

In Aither's view, this expenditure should be deferred until a more rigorous assessment defines the optimum solution for meeting reliability objectives. Aither noted that the need for these works appear to be based on worst case scenarios, rather than based on the most efficient option.

In particular, once the Broken Hill Pipeline is operational, there will be less need to rely on Stephens Creek assets. This is because water will be supplied from the Murray River pipeline going forward, rather than through the Menindee pipeline via the Stephens Creek reservoir. Instead, Aither recommends the investment should be delayed until a probabilistic review of reliability is undertaken.

Aither also noted as these works are for existing assets which service existing customers, it is arguable whether they are truly consequential works, rather than business-as-usual works.

### IPART's draft decision

We agree with Aither's recommendation to defer works, at least until the reliability of the new Broken Hill Pipeline is understood.

Stephens Creek is currently used as the primary water source for Broken Hill residents under water supply arrangements, and these assets in their current condition have provided a level of service to customers that (according to Essential Water's pricing proposal) has "met or exceeded its customer service standard obligations".[72] With Stephens Creek only required as a back-up water source, the need for expenditure to upgrade these assets, at least in the short term, does not appear efficient.

## 6.5.2 Accept Essential Water's proposed pipelines to supply Sunset Strip and the graziers

Essential Water proposes to construct two new pipelines so it can continue to supply customers currently receiving water from offtakes to the Menindee pipeline:

1. A 21 km rising main to transport water from the Menindee water treatment plant to the community of Sunset Strip via the Menindee Lakes caravan park at a capital cost of $1.5 million.
2. An 80 km gravity main from Stephens Creek reservoir to supply graziers north of Sunset Strip along the Menindee Pipeline route, at a capital cost of $10.8 million.

Essential Water considered it is not safe to supply customers via the existing Menindee pipeline (either pumping from Menindee or gravity feeding from Stephens Creek) because of the increased risk of protozoa and bacterial contamination if water is not constantly flowing.

71 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 28.
72 Essential Water pricing proposal to IPART, July 2018, p 79.

### Aither's recommendation

Aither recommended accepting the proposed Menindee to Sunset Strip pipeline expenditure.[73] It considered Essential Water's proposal was the most efficient method for continuing to provide services to a vulnerable residential customer group. It also allowed Essential Water to transition Sunset Strip from chlorinated water to higher value treated water, while decommissioning the expensive and unreliable Sunset Strip treatment plant.

Aither recommended not accepting Essential Water's proposed graziers pipeline. Given the high cost to supply only 11 customers, Aither recommended further work to look for cheaper and more innovative solutions.[74] Aither's recommended expenditure of $5.3 million, which comprised:

- $0.3 million over 2018-21 to allow the existing Menindee pipeline to be gravity fed, and for ongoing monitoring and planning, and
- $5.0 million over 2021-23 to commence (but not necessarily complete) works.

In its response to Aither's draft report, Essential Water submitted that the project needs to be completed by the end of 2019 to maintain service to the graziers. It also stated that the Public Works Authority (PWA) has already undertaken extensive options analysis.[75]

However, Aither has recommended that it would be more efficient to install connection works to gravity feed water from Stephens Creek (following decommissioning of the Menindee pipeline), and monitor the quality of water initially. This would allow Essential Water to then identify the most cost effective option, which could include a hybrid 'bores and pipeline' option where:

- A shorter pipeline is built to service graziers near Stephens Creek, and
- Bores are drilled for customers closer to Menindee, if it is more cost effective to do so.

While PWA investigated the option of a bore field, their scenario was to drill a bore field near the Darling River and pump this water uphill to service all 11 graziers.

Once the most cost effective option has been identified by Essential Water, Aither recommended $5.0 million to commence works over 2021-23. Should the efficient scope of the project be larger than this amount, a further allowance could be considered at the next price review.

### Other stakeholder submissions

At the public hearing, some graziers noted that although they would receive a significant subsidy from other customers (and/or NSW Government) under Essential Water's proposal, they bring significant financial benefits to the community of Broken Hill which could offset these costs.

73 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 29.
74 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 29.
75 Essential Water, Response to Aither's draft report, December 2018 – confidential document.

IPART's draft decision

We have accepted Aither's recommendation that an allowance should be included for a new pipeline to supply treated water from Menindee to Sunset Strip.

We have also decided to accept Essential Water's full proposed expenditure for a new pipeline from Stephens Creek reservoir to supply graziers along the Menindee pipeline route.

We consider it is likely these graziers will continue to require services in the long-term and a permanent solution is appropriate. Analysis by PWA indicates the pipeline option was the most viable option, and we believe the added health risks of using the existing Menindee pipeline in the short-term outweighs the possibility of finding a more efficient solution with additional planning.

We acknowledge Aither's argument that $11.4 million is a large expenditure for just 11 customers, given these costs would be borne across Essential Water's entire customer base. However:

- Our decision to harmonise usage prices for pipeline untreated water users with other untreated water users will improve cost-reflectivity for pipeline customers (see Chapter 8), and
- Essential Water would still have a financial incentive to identify a cheaper solution if it is feasible. Under our incentive-based regulatory framework, any cost savings that Essential Water can identify would be shared with customers over time.

### 6.5.3 Accept proposed upgrades to Mica Street water treatment plant to protect against blue green algae and corrosion

Essential Water proposed $2.2 million over 2018-20 to reduce the corrosiveness of untreated and chlorinated water and remove residual powdered activated carbon used to control algae.

PWA's report considered three options and Essential Water decided to recommend the highest cost option on the basis that it provided the lowest risk to Essential Water and its customers. Under this option Essential Water would convert disused sand filters at the Mica Street water treatment plant into DAF filters to remove PAC and construct new $CO_2$ and lime dossing equipment to control corrosiveness.

Aither's recommendation

Aither considered the proposed option is not efficient without better quantifying the relative risks of the options. Aither recommended proceeding with an interim solution (the second highest cost option identified in PWA's analysis) to better understand the long-term risks. Under this option, corrosive water conditioning was included but PAC filtering was not.[76]

IPART's draft decision

We have accepted Essential Water's proposal to construct DAF filters and lime and $CO_2$ dossers to manage water quality risks for chlorinated and untreated water.

76 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 30.

We acknowledge that the need for pre-treatment will be intermittent (as raw water quality will vary). However, we consider it is reasonable in this case to take a conservative approach.

### 6.5.4 Reduce proposed expenditure on decommissioning the brine pond by $2.0m over 2019-21

PWA considered a number of possible options for decommissioning the brine pond built in 2015 to evaporate waste brine from Broken Hill's reverse osmosis desalination plant. Essential Water states that is contractually obliged to return the land in a remediated state during 2020. Essential Water provided business case documents showing that cost estimates for this project varied widely, ranging from $4.5 million to $17 million. Essential Water's forecasts assumed $10.0 million for the project, over 2019-21.

Aither recommended adopting the lowest cost option ($4.5 million), with a large allowance for contingency ($4.0 million) to account for uncertainty in project costs.

IPART's draft decision

We have accepted Aither's recommendation and reduced Essential Water's proposed expenditure by $1.5 million over 2019-21.

## 6.6 Corporate capital expenditure (non-system assets)

We made draft decisions

17 To include Essential Water's efficient non-system capital expenditure for 2018-19 in the Regulatory Asset Base (RAB), by dividing this expenditure between the water and sewerage RABs based on direct capital expenditure.

18 To create a new corporate Regulatory Asset Base (RAB) from 1 July 2019, with four sub categories: ICT, FFP&E (Furniture, Fittings, Plant & Equipment), vehicles and buildings.

**Table 6.7 IPART's draft decision on corporate capital expenditure ($2018-19)**

| $millions | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Total 2019-22 |
|---|---|---|---|---|---|
| **Non-system assets RAB** | | | | | |
| ICT | n/a | 1.3 | 0.7 | 0.5 | 2.5 |
| FFP&E | n/a | 0.1 | 0.1 | 0.1 | 0.2 |
| Buildings | n/a | 0.2 | 0.1 | 0.2 | 0.5 |
| Vehicles | n/a | 0.1 | 0.1 | 0.1 | 0.2 |
| **Total** | **1.6**[a] | **1.6** | **1.0** | **0.8** | **3.3** |

[a] Non-system assets for 2018-19 have been allocated to the water and sewerage RABs based on direct capital expenditure.

**Note**: FFP&E refers to Furniture, Fittings, Plant and Equipment.

**Source:** Essential Water's September AIR update.

Essential Water's corporate capital expenditure (also known as non-system assets) is the 'indirect' capital costs it occurs in providing its services, such as expenditure on computers, buildings and vehicles required for corporate administrative functions. Since Essential Water

is an operating division of Essential Energy, corporate capital expenditure is essentially a contribution by Essential Water to Essential Energy for the provision of corporate capital assets. Our draft decision is to include efficient corporate capital expenditure in Essential Water's RAB, to be recovered from customers over time.

### 6.6.1 Incorporate $1.6 million of corporate capital expenditure (non-system assets) into Essential Water's water and sewerage RABs for 2018-19

Essential Water only began to identify non-system assets (corporate capital costs) from 2017-18. Essential Water's proposed non-system assets of $1.9 million in 2017-18 and $1.6 million in 2018-19 respectively. We asked Aither to review the efficiency of Essential Water's non-system assets in 2017-18 and 2018-19.

#### Aither's recommendation

Aither recommended accepting Essential Water's proposed non-system capital expenditure for 2018-19.[77]

However, Aither recommended not accepting Essential Water's proposed non-system capital expenditure for 2017-18, because it considered that it did not have sufficient information to determine if the expenditure was prudent and efficient. Aither recommended that Essential Water provide IPART with a more detailed breakdown of these costs as part of its response to this draft report.[78] Specifically, it noted that Essential Water did not provide any detail on these expenditures other than the ICT program. There was also some uncertainty in Essential Water's estimates for 2017-18, with a $0.8 million (or 40%) difference between its June 2018 forecast and September 2018 Annual Information Return.

#### IPART's draft decision

We accept Aither's recommendations regarding the efficiency of Essential Water's non-system assets for 2018-19.

We have incorporated $1.1 million into Essential Water's water RAB and $0.5 million into its sewerage RAB for 2018-19 to account for non-system assets. We have not incorporated any non-system assets into Essential Water's RAB for 2017-18.

Consistent with our decision to establish a new non-system assets RAB from 1 July 2019 (see below), historical non-system assets which we deem to be prudent will be incorporated into Essential Water's existing water and sewerage RABs in proportion to direct capital expenditure.

### 6.6.2 Establish a new non-system assets RAB from 1 July 2019

Essential Water proposed establishing a new RAB for non-system assets as a more transparent method for accounting for corporate capital expenditure. The new RAB would contain four

77 Aither, *Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART*, 25 January 2019, p xii.

78 Aither, *Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART*, 25 January 2019, p 25.

new sub-categories: ICT, FFP&E, vehicles, and buildings. Essential Water proposed rolling prudent and efficient non-system capital expenditure into this new RAB from 2017-18 onwards.

### Aither's recommendation

Aither considered Essential Water's proposed non-system capital expenditure for the 2019 determination period to be necessary and efficient.[79] This was based on its review of Essential Energy's bottom-up assessment of actual corporate assets that were relevant and used by the water business.

Aither also noted that based on the information provided and its examination of Essential Energy's process of allocating corporate costs in its AER approved Cost Allocation Methodology (CAM), it was confident that Essential Energy was not double counting in its proposal of corporate capital costs and corporate operating costs.[80]

### IPART's draft decision

We support Essential Water's proposal to create a new RAB for non-system assets. This is a positive step towards Essential Water better establishing its overall efficient corporate costs for Essential Water, and promotes cost-reflective charges.

We accept Aither's recommendation that Essential Water's proposed corporate capital expenditure from 1 July 2019 is efficient. We consider that it is important for Essential Energy to establish its proposed costs for Essential Water by undertaking a bottom up assessment of actual use and costs.

Our draft decision is to create a new RAB for non-system assets from 1 July 2019 to reflect Essential Water's forecast efficient capital expenditure over the 2019 determination period. We have incorporated historical efficient corporate capital expenditure from 2018-19 into the water and sewerage RABs in proportion to direct water and sewerage capital expenditure in 2018-19, rather than creating the non-system assets RAB retrospectively.

## 6.7 Asset lives

Water utilities typically construct and operate assets which are long-lived. The building block method provides an allowance for regulatory depreciation so that the capital a utility invests in its regulated assets is recovered from customers over the useful life of each asset. To calculate this allowance, we need to decide on the appropriate useful lives for the assets in Essential Water's RAB. As with capital expenditure, we sought advice from Aither on Essential Water's asset lives.

### We made draft decisions

19 To adopt new and existing water and sewerage asset lives as set out in Table 6.8.

20 To adopt new corporate asset lives as set out in Table 6.9.

79 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 101.

80 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 69.

Essential Water proposed to maintain its asset lives for new water and new sewerage assets from its 2014 Determination (Table 6.8). It also proposed to update its asset lives for existing water and sewerage assets to reflect the capital expenditure it undertook over its 2014 determination period.

As mentioned in Section 6.6 above, Essential Water proposed a new RAB category for corporate assets – which are non-system assets such as ICT, buildings, plant and equipment and motor vehicles. Its proposed lives for these assets are shown in Table 6.9.

**Table 6.8 IPART's draft decision and Essential Water's proposed asset lives for water and sewerage**

| Regulatory life of assets (years) | Essential Water's proposed | | IPART's draft decision | |
|---|---|---|---|---|
| | Water | Sewerage | Water | Sewerage |
| New assets | 98 | 89 | **98** | **89** |
| *New assets (2014 Determination)* | *98* | *89* | - | - |
| Remaining life of existing assets | 50 | 49 | **50** | **49** |
| *Remaining life of existing assets (2014 Determination)* | *46* | *47* | - | - |

**Note:** Columns may not sum due to rounding.

**Source:** 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.

**Table 6.9 IPART's draft decision and Essential Water's proposed asset lives for corporate assets**

| Regulatory life of assets (years) | Essential Water's proposed | IPART's draft decision |
|---|---|---|
| IT | 4 | 10 |
| Furniture, fittings, plant and equipment | 6.7 | 7 |
| Motor vehicles | 15 | 15 |
| Buildings | 50 | 50 |

**Source:** Aither draft report, *Essential Water capital and operating expenditure review*, November 2018, p35.

### Aither's recommendation

As part of the review of Essential Water's proposed costs, we asked Aither to examine Essential Water's proposed asset lives for water, sewerage and corporate assets. It found Essential Water's proposal to be reasonable, with the exception of ICT assets. It considered that four years was unreasonable as it appeared too short compared with what is typically applied for corporate ICT assets. Aither recommended that we instead adopt a 10 year asset life for new assets, consistent with IPART's 2016 Determination for Sydney Water. The 10 year asset life we adopted in that review, was an average of 15 years for new systems and Enterprise Resource Planning assets, and five years for other computer systems.

### IPART's draft decision

Our draft decision is to accept Aither's recommendations as being reasonable. We also decided to round up Essential Water's proposed asset lives for 'furniture, fittings, plant and equipment' to seven years for simplicity.

## 6.8 Output measures

Essential Water has adopted output measures to inform stakeholders on whether they are delivering on their customer service levels targets (see Appendix I). Its current customer service level targets cover:

- The availability of water supply
- Water quality
- Response times
- Sewerage performance
- Customer complaints
- Notice periods, and
- Duration of planned interruptions.

Essential Water has proposed to maintain its existing service level targets in the 2019 determination period.

### We made a draft decision

21 To retain the current output measures of Essential Water's performance.

Output measures are important because we set prices to enable the utility to recover the forecast costs of meeting these targets. If output measure targets are not met, it could indicate that the levels of service, to which we have linked our prices, are not being met and there is a deficiency in the planning and delivery of capital projects. However, strict conclusions about Essential Water's performance should not be drawn on the basis of whether or not it has met these targets. There may be reasonable explanations why it does not meet certain targets. For example, as circumstances evolve over a determination period, changing a target may result in a better outcome for customers. In such cases, the output measures can provide a reference point for articulating changes in priorities.

### Aither's recommendation

As part of the review of Essential Water's proposed costs, we asked Aither to review Essential Water's performance against its current output measures. Aither found that some quantitative targets were not appropriately measured against, including response times for water and sewerage system failures.[81] Aither noted that while Essential Water has outlined quantitative response time targets, actual performance against the targets is not measured on a job-by-job basis.

81 Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 37.

Aither further noted that Essential Water has identified its inability to measure itself against its response time targets as an issue and that Essential Water has committed to implement appropriate procedures to capture performance prior to July 2019. In addition to these procedures, Aither recommended that further improvements be made with regard to collecting data to measure Essential Water's performance against output targets.

### IPART's draft decision

We have decided to accept Essential Water's proposal to maintain current existing service level targets in the 2019 determination period. We agree with Aither that Essential Water's output measures should provide a quantitative assessment of its performance in future reviews, and that Essential Water should implement procedures to adequately measure performance against its quantitative targets. This will help with communicating with customers regarding the level of service they are receiving.

Going forward, Essential Water should continue to monitor performance against its customer service level targets and review them at the next price review.

# 7 Forecast water sales and customer numbers

Once we have determined the revenue requirement for the 2019 determination period, the next step in our approach is to decide on Essential Water's forecast water demand, chargeable sewerage volumes and customer numbers. These forecasts are used in calculating the water and sewerage price levels required to recover the notional revenue requirement, less the NSW Government contribution.

It is important that the forecasts are reasonable. If they differ significantly from Essential Water's actual water sales, customers numbers and chargeable wastewater volumes over the determination period, the determined prices will result in the utility significantly over- or under-recovering its required revenue. If the 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.

This chapter discusses our draft decisions on Essential Water's forecast water sales, customer numbers and chargeable wastewater volumes over the 2019 determination period. To assist us in making our draft decisions, we engaged consultants Frontier Economics to review Essential Water's estimates for demand and customer numbers. We also considered stakeholder submissions and undertook our own analysis.

We note that we are undertaking a concurrent review of prices for WaterNSW's Murray River to Broken Hill Pipeline services from 1 July 2019. Essential Water is the major customer for the Pipeline, and our draft decision on Essential Water's forecast demand from the WaterNSW pipeline is contained within that review.

## 7.1 Summary of our decisions

We have made draft decisions:

- To adopt forecast metered water sales that are about 12% higher than Essential Water's forecasts. This mainly reflects our decision to incorporate a 10% "bounce-back" in demand from residential, business and exempt properties customers.
- To accept Essential Water's forecast that non-residential sewerage volumes would remain constant.
- To adopt slightly higher forecasts of customer numbers than proposed by Essential Water. We expect that customer numbers will decline by 0.5% per year, in comparison with Essential Water's forecast of a 1% fall per year.

We also discuss the draft decision, in the WaterNSW pipeline review, on Essential Water's forecast demand from the Pipeline. We expect that Essential Water's bulk water purchases from WaterNSW will be lower, on average, than the total water Essential Water supplies to its customers, as existing storage reservoirs can be used to supply some water to Broken Hill.

## 7.2 Forecast metered water sales

### We made a draft decision

22 To adopt forecast metered water sales as shown in Table 7.1.

Our forecast metered water sales are about 12% higher than forecast by Essential Water. This reflects:

- Our decision to incorporate a "bounce back" in demand due to an expected change in customer behaviour when the Pipeline is operational, as it would increase the security of water available to the community of Broken Hill.
- The analysis of Frontier Economics which suggests that basing water forecasts on 2016-17 consumption is not appropriate because that year is, in fact, a lower residential demand year.

Other than this difference, we have broadly accepted Essential Water's demand forecasts, including:

- A gradual decrease in water demand over the 2019 determination period due to Broken Hill's declining residential population in line with Essential Water's proposal, but at a slightly lower rate.
- Accepting Essential Water's proposal that non-residential demand would remain relatively constant.

We have not applied any price elasticity adjustments to our water demand forecasts as our draft decision is to maintain most prices in real terms (see Chapter 9).

**Table 7.1 IPART's draft decision and Essential Water's proposed forecast metered water sales (ML)**

| | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|
| **Essential Water's proposed** | | | |
| Treated water | 4,129 | 4,111 | 4,093 |
| Chlorinated water | 42 | 42 | 42 |
| Untreated water | 976 | 976 | 976 |
| Total | 5,147 | 5,129 | 5,111 |
| **IPART's draft decision** | | | |
| Treated water | 4,810 | 4,797 | 4,781 |
| Chlorinated water | 49 | 48 | 48 |
| Untreated water | 1,109 | 1,109 | 1,109 |
| **Total** | **5,967** | **5,955** | **5,938** |
| *Difference* | *820* | *825* | *826* |

**Note:** Totals may not add due to rounding.

**Source**: Essential Water pricing proposal to IPART, July 2018, p 101; IPART analysis.

### 7.2.1 Actual water sales over the 2014 determination period were lower than forecast

Broken Hill experienced drought conditions throughout most of the 2014 determination period which resulted in water restrictions over 2015 and 2016.[82] This led to lower than forecast water demand between 2014-15 and 2016-17 (see Table 7.2). However, customer demand rebounded during 2017-18 following the announcement of the Pipeline and easing of water restrictions.[83] Although this impacted Essential Water's revenue, the shortfall was largely offset through reduced capital spending.[84]

**Table 7.2 Forecast and actual water sales (ML per year)**

| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | Total |
|---|---|---|---|---|---|
| IPART 2014 Determination | 5,526 | 5,482 | 5,440 | 5,401 | 21,850 |
| Actual water sales | 5,007 | 4,618 | 4,865 | 5,870 | 20,360 |
| Difference % | -9% | -16% | -11% | 9% | -7% |

**Note:** The above table includes total water sales to all customers (including the mines): treated, chlorinated and untreated.

**Source:** IPART, Essential Energy's water and sewerage services in Broken Hill, Final Report 2014, Table 8.1; Essential Water Pricing Proposal to IPART, September 2018.

### 7.2.2 Forecast metered water sales for the 2019 determination period

For the 2019 determination period, Essential Water forecast a decrease in total water demand from 5,167 ML in 2018-19 to 5,111 ML by 2021-22 (see Table 7.3). This represents a total decrease of 1.1% (or -0.4% per year) over the forecast period.

To assist us in reviewing Essential Water's proposal, we engaged Frontier Economics to review Essential Water's forecast metered water sales, and recommend its own forecasts (Table 7.3).

**Table 7.3 Essential Water's and Frontier Economics' forecast metered water sales (ML)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|
| Essential Water | 5,167 | 5,147 | 5,129 | 5,111 |
| Frontier Economics | n/a | 5,435 | 5,422 | 5,407 |
| IPART's draft decision | n/a | 5,967 | 5,955 | 5,938 |

**Source:** Frontier Economics, Review of WaterNSW and Essential Energy's Water Forecasts, Final Report, January 2019.

#### Essential Water based its forecasts from a low residential demand year

Essential Water established its baseline demand forecast based on 2016-17 levels.[85] It considered 2016-17 was the most recent year with 'normal' consumption data, ie, with fairly typical rainfall and no water restrictions. Essential Water then forecast treated water sales to

82 Essential Water pricing proposal to IPART, July 2018, p 80.
83 https://www.waternsw.com.au/projects/wentworth-to-broken-hill-pipeline (accessed 15 January 2019); Essential Water pricing proposal to IPART, July 2018, p 80.
84 See Chapter 6.
85 Essential Water pricing proposal to IPART, July 2018, p 103.

decline by 0.4% per year and chlorinated water sales to decline by 0.6% per year over the 2019 determination period,[86] by assuming that:

- Residential water consumption would decline by around 0.8% per year, reflecting its forecast that the population of Broken Hill will decline by 1% per year over the regulatory period, which is partially offset by a slight increase in per capita consumption.
- Treated, untreated and chlorinated water sales to non-residential customers would remain constant.
- Demand for treated and untreated water from the existing mining companies would also remain constant.
- No new mining customers would begin operating.[87]

### Frontier Economics prepared a demand forecast

Frontier Economics considered that basing demand forecasts on a single year of consumption data (2016-17) was potentially unreliable, especially given the high variability in Essential Water's historical demand. Based on historical trends, Frontier identified that 2016-17 was in fact a low residential demand year.[88]

Frontier Economics also identified that the volatility in Essential Water's historical customer demand was largely due to two causes: reduced per capita demand during high rainfall years and water restrictions during drought years.[89] Frontier Economics addressed this issue by excluding years which were affected by these factors, and used seven of the last 12 annual data points to establish a baseline level of demand.[90]

To determine forecast changes in residential water demand, Frontier Economics projected changes in residential customer numbers using publicly available forecasts from the NSW Department of Planning and Environment (NSW DPE) rather than purely relying on recent historical changes. NSW DPE is projecting that residential customers would fall by 0.4% to 0.5% per year in Broken Hill.[91] We agree that Frontier Economics' approach is preferable to using recent historical data.

We also agree that Frontier Economics' approach to forecasting a baseline demand is more robust than focusing on a single year of demand.

86 Essential Water pricing proposal to IPART, July 2018, p 101.
87 Essential Water pricing proposal to IPART, July 2018, p 109.
88 Frontier Economics, Review of WaterNSW and Essential Energy's water forecasts – Final Report, January 2019, p 14.
89 Frontier Economics, Review of WaterNSW and Essential Energy's water forecasts – Final Report, January 2019, p 16.
90 Frontier Economics, Review of WaterNSW and Essential Energy's water forecasts – Final Report, January 2019, pp. 11-13.
91 Frontier Economics, Review of WaterNSW and Essential Energy's water forecasts – Final Report, January 2019, p 14.

### We have included an estimate of demand "bounce back" in our forecast

The construction of the Pipeline is expected to deliver a more reliable water source and hence reduce the likelihood of water restrictions. Therefore, we consider it reasonable for there to be a bounce back in water demand because Broken Hill has:

- A very high proportion of detached houses with gardens and relatively few apartments
- Historically high discretionary water use, and
- An ongoing lead dust management problem, requiring garden and municipal watering to protect human health.

We asked Frontier Economics to investigate the potential bounce back in demand that could be expected from the Pipeline. Frontier Economics analysed changes in water consumption from other communities which have come out of drought conditions. It looked at four regional Victorian water corporations which experienced bounce backs of between -3% and 25% in the four years that followed the easing of drought conditions.[92]

Frontier Economics did not incorporate an estimate of the bounce back into their forecasts because they considered the increase in demand from 2016-17 to 2017-18 was evidence that a bounce back had already occurred and was therefore accounted for in its baseline forecast.[93] However, we consider that the additional water security created by the pipeline will provoke behavioural changes, such as planting gardens and lawns and expanding water intensive businesses, which were discouraged by the uncertainty of future water restrictions. This would increase water demand above recent unrestricted levels.[94] We also note that our demand forecasts are similar to 2017-18 consumption, which is consistent with Frontier's argument.

To supplement Frontier Economics' bounce-back analysis, we looked at other communities which received major supply augmentations in response to the Millennium Drought.[95] We calculated the bounce back by comparing 2016-17 water usage to minimum water usage during the Millennium Drought period (Table 7.4). Of these utilities, larger bounce backs were observed in regional cities such as Ballarat and Goulburn than in metropolitan areas.

92 Frontier Economics, Review of WaterNSW and Essential Energy's water forecasts – Final Report, January 2019, p 17.

93 Frontier Economics, Review of WaterNSW and Essential Energy's water forecasts – Final Report, January 2019, pp. 16-17.

94 Although, we note that level 1 water restrictions were recently introduced in December 2018. http://www.essentialwater.com.au/asset/cms/pdf/media/ES-MR-01122018.pdf (accessed 16 January 2019).

95 Millennium Drought - period from late 1996 to mid-2010 where South Australia, including the Murray-Darling Basin and most of the southern states were affected by severe drought conditions.

**Table 7.4 Estimated bounce-back in demand from water supply augmentations**

| Utility | Augmentation | Bounce back |
|---|---|---|
| Central Highlands Water (Ballarat region) | Pipeline | 20% |
| Goulburn Mulwaree Council | Pipeline | 17% |
| Icon Water (Canberra) | Dam | 7% |
| Sydney Water | Desalination Plant | 13% |
| City West Water (Melbourne) | Desalination Plant | 6% |

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

We have adopted a 10% bounce back to our demand forecast for Essential Water's residential, business and exempt properties customers. We have not applied a bounce back to mining customers, given their water demand is more closely related to production levels, which are instead influenced by external factors such as commodity prices.

We consider the 10% adjustment to be reasonable because:

- There is considerable scope for increased discretionary water use in Broken Hill, particularly due to health concerns such as lead dust suppression
- Frontier Economics' analysis of water consumption in other communities which have come out of drought conditions also suggests an average bounce back of about 10%, and
- Our analysis of water consumption following recent water supply augmentations in other water utilities also suggests an average bounce-back of about 10%.

## 7.3 Forecast sewerage volumes

Our draft decision on forecast billable sewerage volumes only relate to non-residential customers. This is because residential customers do not face an explicit sewerage usage charge as we have deemed that each customer discharges 90 kL of sewerage per year and have included this as part of their sewerage service charge (see Chapter 9).

### We made a draft decision

23 To adopt forecast billable sewerage volumes as shown in Table 7.5.

**Table 7.5 IPART's draft decision on billable sewerage volumes (ML)**

| | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|
| Non-residential customers (excluding exempt properties and mines) | 259 | 259 | 259 |
| Exempt properties | 267 | 267 | 267 |
| Mines | 29 | 29 | 29 |
| Total billable sewerage volumes | 555 | 555 | 555 |

**Note:** Residential customers are deemed 90 kL of sewerage usage in their service charges and not charged an explicit usage charge. The billable sewerage volumes only relate to non-residential sewerage usage, including exempt properties.

Exempt properties are customers that are exempt from paying service charges, but are still required to pay relevant water and sewerage usage charges.

**Source:** Essential Water pricing proposal to IPART, July 2018, p 111.

Essential Water proposed forecast billable sewerage volumes of 555 ML per year over the 2019 determination period.[96] This amount is consistent with its latest forecast of 555 ML for 2018-19.

As Essential Water's proposal is in line with recent historical averages of 558 ML per year[97], we have accepted this proposal. We also considered whether it would be appropriate to incorporate a bounce-back in billable volumes, consistent with our decision for water usage, but did not do so because:

- We expect that a large proportion of an increase in demand would relate to 'discretionary' use, which we consider has minimal impact on the sewerage system.
- As discussed in Chapter 8, we have based sewerage prices on 2018-19 revenues. As a result, the forecast billable sewerage volumes we set do not impact the price that customers would pay.[98]

Therefore, our draft decision is to accept Essential Water's proposed billable sewerage volumes.

## 7.4 Forecast water and sewerage customer numbers

### We made a draft decision

24 To adopt forecast water and sewerage customer numbers as shown in Table 7.6.

As discussed above, we have accepted Frontier Economics' baseline demand forecast for water[99] which included the use of NSW DPE's projections of residential customer numbers for Broken Hill. Therefore, we have adopted the same forecast residential water customer numbers (see Table 7.6).[100] We have also accepted Frontier's forecast that non-residential water customers would remain constant at current (2018-19) levels.[101]

Under our draft decision, residential water customer numbers are forecast to decline by about 0.5% per year rather than the 1% decline proposed by Essential Water using historical trends.

For sewerage customers, we have applied a 0.5% per year reduction for residential sewerage customers, consistent with our decision on residential water customers. For non-residential customers, we have accepted Essential Water's proposal to maintain forecast customer numbers at current (2018-19) levels in line with our draft decision to accept its billable sewerage volume forecasts for the same customers.[102]

96 Essential Water pricing proposal to IPART, July 2018, Table 5-7, p 111.
97 Averaged over 2014/15 to 2018/19.
98 It does, however, have a small impact on our recommended Government funding contribution.
99 We have adjusted Frontier Economics' forecast baseline demand for a bounce back in water demand.
100 However, for consistency with our pricing model – which is based on the number of residential customers – we have adjusted Frontier Economics' meter forecasts to account for apartments with shared meters.
101 Frontier Economics, Review of WaterNSW and Essential Energy's water forecasts – Final Report, January 2019, pp. 20-22.
102 Essential Water pricing proposal to IPART, July 2018, p 112.

**Table 7.6 IPART's draft decision on forecast water and sewerage customers**

| No. of connections | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|
| **Water** | | | |
| Residential[a] | 9,788 | 9,753 | 9,705 |
| Non-residential (excluding exempt properties) | 588 | 588 | 588 |
| Exempt properties | 249 | 249 | 249 |
| Pipeline | 46 | 46 | 46 |
| **Sewerage** | | | |
| Residential[b] | 9,148 | 9,113 | 9,065 |
| Non-Residential (excluding exempt properties and mines) | 548 | 548 | 548 |
| Exempt properties | 140 | 140 | 140 |
| Mines | 2 | 2 | 2 |

**a** Includes 458 units which have a common meter for water services.

**b** Includes 433 units which have a common meter for sewerage services.

**Note:** Our customer numbers in the above table incorporates our draft decision to not charge unconnected properties water and/or sewerage service charges – that is, these properties are no longer included in the customer count.

For modelling actual prices, we have also converted the non-residential water and sewerage customers into 20mm meter equivalents and applied relevant discharge factors.

## 7.5 Essential Water's bulk water purchases from WaterNSW

In the WaterNSW Pipeline Draft Report,[103] we made a draft decision on Essential Water's forecast water purchases from WaterNSW. In this section, we summarise how we derived this forecast, and why it differs from Essential Water's forecast water sales to customers.

Table 7.7 shows that the two key differences between these forecasts are:

- Our estimate of Essential Water's 'real' water losses, and
- That existing storage reservoirs at Stephens Creek and Umberumberka could be used to supply customers, if there is sufficient rainfall.

**Table 7.7 Comparison of IPART's estimates for Essential Water's forecast demand from customers and its purchases from WaterNSW (ML)**

| Forecast | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|
| IPART's estimate of Essential Water's forecast water sales | **5,967** | **5,955** | **5,938** |
| Plus: Real water losses in Essential Water's existing network | +324 | +323 | +322 |
| Less: Supply from existing storages | -1,910 | -1,910 | -1,910 |
| Essential Water's purchases from WaterNSW | **4,382** | **4,368** | **4,350** |

103 IPART, Review of prices for WaterNSW Murray River to Broken Hill Pipeline from 1 July 2019 – Draft Report, April 2019.

### We considered the impact of water losses in the Essential Water network in our forecasts

In any water supply system, there are system losses as a result of leaking pipes, main breaks, system flushing etc. We treat these 'real' water losses as non-revenue water for modelling purposes. However, Essential Water will need to purchase water from WaterNSW to cover these losses. Essential Water calculates its real losses by subtracting metered water sales from the total volume it extracts.

To account for real losses for its water demand from the Pipeline, we added a factor of 5.4% to Essential Water's total water demand (including the 10% bounce back). This is the 10 year average of real losses reported by Essential Water. Essential water's real losses are quite low compared to similar utilities, at roughly half of the national average.[104]

### We considered the impact of rainfall in our forecasts

Given the cost of pumping water from the Murray River to Broken Hill, we consider it is more cost effective for Essential Water to access water from its storages in preference to the Pipeline, if there is sufficient rainfall to do so.

Essential Water currently operates two water storages: Stephens Creek reservoir and Umberumberka reservoir.[105] Umberumberka receives water from rainfall only. Stephens Creek receives water from rainfall in its catchment. Additionally, water that is pumped from the Menindee Lakes pipeline is also transported to, and stored at, Stephens Creek reservoir.

To forecast the water demand from Essential Water's storages, we obtained 20 years of daily data on the volume of water pumped:

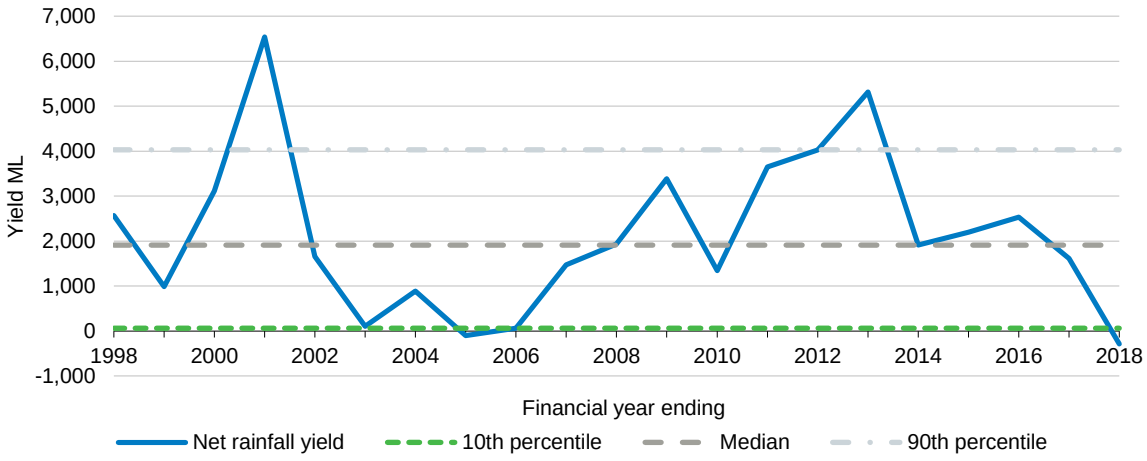
- From the Umberumberka pump station
- From the Stephens Creek pump station, and
- From the Menindee Lakes pump station to Stephens Creek along the Menindee pipeline.

We estimated that the volume of water supplied using rainfall from the two reservoirs is the difference between the volume pumped from Stephens Creek and the volume pumped into Stephens Creek from the Menindee Pump Station,[106] plus the volume from the Umberumberka pump station.

We estimated the calculated rainfall yield from Essential Water's storages over the last 20 years (see Figure 7.1). Our analysis shows that in particularly dry years, the net rainfall yield was close to zero, requiring heavy reliance on the Menindee pipeline to meet Broken Hill's raw water needs. Equally, in wet years, most of Broken Hill's water demand (which is 5,000 ML to 6,000 ML per year) can be supplied from rainfall. The historical median yield has been about 1,910 ML per year.

104 Bureau of Meteorology, National Performance Report: Urban Utilities 2016-17.
105 See Chapter 2.
106 We also made a small adjustment for evaporation at Stephens Creek dam, based on Essential Water's seasonal estimates of evaporation.

**Figure 7.1 Net rainfall yield from Essential Water's storages**




**Source:** Essential Water and IPART analysis.

We estimate that about 30% of Broken Hill's water needs could be supplied from storage reservoirs, on average. Although the volume of water supplied from rainfall is volatile, we consider it appropriate to subtract the median amount of water supplied from rainfall from the amount of water that Essential Water purchases from WaterNSW.

We also note that our estimates of the water supplied from rainfall are more conservative than Essential Water's submission to the 2012 *Inquiry into Adequacy of Water Storage in NSW*. In that submission, Essential Water estimated that the reservoirs at Stephens Creek, Umberumberka and Imperial Lake supply between 30 per cent and 90 per cent of local annual water needs, depending on rainfall.[107]

107 Essential Water 2012, Submission to Inquiry into Adequacy of Water Storage in NSW, Submission No. 51. Available at: www.parliament.nsw.gov.au/lcdocs/submissions/41996/0051%20Essential%20Water.pdf

# 8 Water prices

Essential Water's prices for water services comprise two components:

- A fixed service price (expressed as $ per year), and
- A variable usage price (expressed as $ per kilolitre (kL) of metered water supplied).

Currently, all residential customers pay a standard service price, regardless of whether their property is a house or a unit in a multi-premises property. For larger non-residential customers, the service price depends on their meter size, and is set with reference to a 20mm meter. Customers pay a different water usage price if they receive treated water (of $1.80 per kL), chlorinated water (of $1.16 per kL) or untreated water (from $0.78 to $1.58 per kL).

For this review, Essential Water proposed to:

- Retain the current structure of prices, whereby all customers pay a fixed price and a usage price, and
- Increase service and usage prices for all customers by 4.2% per year, in real terms.

The sections below summarise our draft decisions on water prices, and then discuss those decisions and our consideration of Essential Water's proposal and stakeholders' comments in more detail.

## 8.1 Summary of our draft decisions on water prices

Table 8.1 sets out our draft decision on Essential Water's water prices, and shows that most of those prices remain the same as the current prices for the 3-year determination period. In comparison, under Essential Water's proposal, all prices would increase by 13.3% over the three years (Table 8.2).

The draft water prices reflect our draft decisions to:

- Accept Essential Water's proposal to maintain current price structures
- Maintain service prices for residential and non-residential customers in real terms
- Maintain the usage price for treated water in real terms
- Maintain the usage price for untreated water for most customers in real terms
- Promote consistency in other usage prices by:
  - Increasing the untreated water usage price for pipeline customers in 2019-20 so it is in line with the price for other untreated water customers
  - Gradually increasing the chlorinated usage price over the determination period so that it transitions towards the untreated usage price, and
- Maintain our current water pricing approach for mining customers.

These draft decisions are discussed in the sections below. They were informed by stakeholder feedback and our analysis of the costs of supplying water to Essential Water's customers. We also considered the NSW Government's commitment to maintain price stability, for four years, as a result of the pipeline (see Box 1.1).

**Table 8.1 IPART's draft decision on Essential Water's water prices ($2018-19 – ie, without inflation)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Service Charges ($/year)** | | | | | |
| Residential | 327.68 | 327.68 | 327.68 | 327.68 | 0.0% |
| Non-residential[a] | | | | | |
| – 20mm connection | 327.68 | 327.68 | 327.68 | 327.68 | 0.0% |
| – 25mm connection | 512.00 | 512.00 | 512.00 | 512.00 | 0.0% |
| – 40mm connection | 1,310.72 | 1,310.72 | 1,310.72 | 1,310.72 | 0.0% |
| – 100mm connection | 8,192.01 | 8192.00 | 8,192.00 | 8,192.00 | 0.0% |
| Mines ($ 000s) | | | | | |
| – Perilya | 2,301.55 | 2,762.49 | 2,762.49 | 2,762.49 | 20.0% |
| – CBH | 555.17 | 663.21 | 663.21 | 663.21 | 19.5% |
| **Usage Charges ($/kL)** | | | | | |
| Treated | 1.80 | 1.80 | 1.80 | 1.80 | 0% |
| Chlorinated | 1.16 | 1.22 | 1.28 | 1.34 | 15.5% |
| Untreated – Pipeline[b] | 0.78 | 1.58 | 1.58 | 1.58 | 102.6% |
| Untreated – Non-pipeline | 1.58 | 1.58 | 1.58 | 1.58 | 0% |

**a** The meter based charges are set with reference to the 20mm meter charge based on the following formula: (meter size)$^2$x20mm meter charge/400.

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

**Table 8.2 Essential Water's proposed water prices ($2018-19 – ie, without inflation)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Service Charges ($/year)** | | | | | |
| Residential | 327.68 | 341.58 | 356.08 | 371.19 | 13.3% |
| Non-residential[a] | | | | | |
| – 20mm connection | 327.68 | 341.58 | 356.08 | 371.19 | 13.3% |
| – 25mm connection | 512.00 | 533.72 | 556.37 | 579.98 | 13.3% |
| – 40mm connection | 1,310.72 | 1,366.34 | 1,424.31 | 1,484.75 | 13.3% |
| – 100mm connection | 8,192.01 | 8,539.60 | 8,901.94 | 9,279.67 | 13.3% |
| Mines ($ 000s) | | | | | |
| – Perilya | 2,301.55 | 2,399.20 | 2,501.00 | 2,607.13 | 13.3% |
| – CBH | 555.17 | 578.72 | 603.28 | 628.88 | 13.3% |
| **Usage Charges ($/kL)** | | | | | |
| Treated | 1.80 | 1.88 | 1.96 | 2.04 | 13.3% |
| Chlorinated | 1.16 | 1.21 | 1.26 | 1.31 | 12.9% |
| Untreated – Pipeline[b] | 0.78 | 0.81 | 0.85 | 0.88 | 12.8% |
| Untreated – Non-pipeline | 1.58 | 1.65 | 1.72 | 1.79 | 13.3% |

**a** The meter based charges are set with reference to the 20mm meter charge based on the following formula: (meter size)$^2$x20mm meter charge/400. We have calculated service charges for larger meter sizes using this formula, based on Essential Water's stated 20mm meter price.

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

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

## 8.2 Stakeholders were concerned that price increases would not be affordable

Both Broken Hill City Council[108] and the Public Interest Advocacy Centre (PIAC)[109] raised concerns about the ability of the Broken Hill community to afford price increases. The Broken Hill City Council noted the city's persistently high unemployment rate, lower than average socio-economic profile and high pensioner population makes it more difficult for residents to afford price rises.

The Broken Hill Darling River Action Group submitted that Broken Hill's population was heavily dependent on welfare and had little capacity to afford price increases above inflation.[110] It believed higher prices would cause more people to leave, placing further cost pressures on the remaining residents.

108 Broken Hill City Council, submission to the Issues Paper – Review of prices for Essential Energy's water and sewerage services in Broken Hill from 1 July 2019, October 2018, p 4.

109 Public Interest Advocacy Centre, submission to the Issues Paper – Review of prices for Essential Energy's water and sewerage services in Broken Hill from 1 July 2019, November 2018, p 3.

110 Broken Hill Darling River Action Group, submission to the Issues Paper – Review of prices for Essential Energy's water and sewerage services in Broken Hill from 1 July 2019, October 2018, p 2.

Individual Broken Hill resident submissions argued that any price rises would unfairly affect low income earners and reduce their ability to manage lead dust pollution.

We consider that our draft decisions on prices address stakeholder concerns about affordability. In particular, the service and usage prices for almost all customers would remain constant in real terms. Our draft decision to increase usage prices for chlorinated and untreated pipeline customers would improve the cost reflectivity of these charges.

In addition, we have gradually implemented the increase for chlorinated water customers to recognise the potential for bill shock. We also note that bills for these customers would be lower than proposed by Essential Water (see Chapter 11).

## 8.3 Maintain current price structures

### We made a draft decision

25 To accept Essential Water's proposal to maintain the current 2-part tariffs for water and sewerage prices.

Essential Water proposed to maintain the current price structures for water and sewerage services, primarily because introducing alternative structures would be too costly to develop given the small size of its business. It also proposed to maintain the current balance between fixed service charges and variable usage charges (where each charge accounts for about half of residential water and sewerage bills, on average).

Essential Water's customer survey results suggest that 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.

We consider that maintaining the current 2-part price structure for water and sewerage services is appropriate as it provides certainty and stability for both customers and Essential Water. We agree that developing alternative pricing structures would be too costly in this instance. We note that Essential Water's customer survey results suggest that most customers would prefer the current price structure and balance between fixed and usage charges to be maintained, and that no submissions from stakeholders suggested alternative price structures.

## 8.4 Maintain service prices in real terms

### We made a draft decision

26 To maintain service prices to residential and non-residential customers in real terms.

Our draft decision is to maintain the current water service charge for residential customers (both houses and apartments) and non-residential customers with a 20mm meter at $327.68 per annum in real terms. Non-residential customers with multiple meters and/or meters greater than 20mm in size would have their charges scaled-up proportionally, as shown in Table 8.1.

We consider that our draft decision provides price stability for customers, and is consistent with the NSW Government funding commitment that prices do not rise in real terms as a result of the Murray River to Broken Hill pipeline (see Chapter 4).

Under our draft decisions, average water bills for treated water customers would remain unchanged in real terms. However, bills for chlorinated, untreated pipeline customers and mines would increase in real terms, as discussed in Section 11.1. These increases are not due to the Murray River to Broken Hill pipeline, but rather our draft decisions to re-balance charges so that they better reflect the efficient costs required to serve each customer group.

### We considered setting different service charges for houses and apartments

Currently, a standard residential service charge means that each flat or apartment is charged as if it were a single house. Residential apartment blocks are not charged according to the actual size of the water meter connecting them to the network.

Essential Water opposed different service charges for houses and apartments because the majority of customers in Essential Water's consultation opposed this. We did not receive comment from other stakeholders specifically on this issue.

Therefore, we have decided to set a single standard residential service charge for houses and apartments. Our view is that introducing different service charges would increase complexity with little potential benefit.

### We considered setting different water service and usage charges for customers in different locations

We considered setting different charges for different locations based on the underlying costs of servicing each group (eg, Broken Hill customers vs Sunset Strip customers vs graziers).

Essential Water noted that while geographical pricing could be economically efficient, there are practical impediments:

- A review of capital and operating costs, estimates of marginal costs and reallocating the RAB would be required for each section of the network, which could be time consuming.
- The billing system would need to be redesigned to accommodate the change.
- There could be very large bill impacts for individual customers, which IPART has not consulted on.
- Component costs for sunset strip and the graziers are highly dependent on the consequential works.

Our expenditure consultants, Aither, considered that because detailed costing information is not available from Essential Water, geographic prices would unlikely be cost-reflective and therefore unlikely to improve economic efficiency.[111] Due to practical limitations, our view is to accept Aither's recommendation and not set different prices for different customer groups, even though the underlying costs of servicing may differ.

[111] Aither, Essential Water expenditure review – a review of capital and operating expenditure, Final Report for IPART, 25 January 2019, p 15.

We did not receive comment from any other stakeholders specifically related to differential geographical pricing.

## 8.5 Maintain the usage price for treated water in real terms

### We made a draft decision

27 To maintain the current treated water usage price of $1.80 per kL in real terms.

Our draft decision is to maintain the current treated water usage price of $1.80 per kL in real terms (ie, without inflation) over the determination period. This decision takes account of customers' preference to maintain the current proportion of fixed and variable charges for water services. It also reflects our preference for setting usage prices with reference to the marginal cost of supply.

### Maintain the current proportion of fixed and variable charges for water services

Currently, service and usage charges each account for about half of residential water charges, on average. Essential Water's customer survey results suggest that 70% of residential customers would prefer the current fixed/variable proportion of their bills to be maintained.[112]

Our decision would maintain the current proportion of fixed and variable charges for treated water customers (which comprise the majority of customers).[113] We note that maintaining usage prices is important for customers to manage lead dust pollution in Broken Hill.

### Set water usage charges with reference to short run marginal cost

As our Issues Paper discussed, water usage charges can be set with reference to either the long run marginal cost (LRMC) or the short run marginal cost (SRMC) of water supply.

LRMC sends an efficient price signal to customers about the cost of consuming an additional litre of water, as it prices the impact that water consumption today places on the need for future water augmentation. We typically set water usage prices with reference to LRMC in pricing reviews where future growth is expected.

We note that for the Broken Hill area, water consumption has been declining in recent years. In addition, given the Broken Hill Pipeline and proposed consequential works are expected to become operational in the 2019 determination period, no further large-scale augmentation of the water supply is foreseeable in the future. Therefore, we consider that in the context of Broken Hill, LRMC and SRMC estimates should converge. Given that the calculation of SRMC is more straightforward than LRMC, we consider its use more appropriate in the context of Broken Hill.

Therefore, we estimated Essential Water's SRMC of supplying water based on a bottom-up assessment of operating costs based on information provided by Essential Water on its water operations (see Appendix H). This gave an estimate of $1.29 per kL, including the cost of

112 Essential Water pricing proposal to IPART, July 2018, p 187.

113 That is, holding all else constant. With the introduction of the Murray River to Broken Hill pipeline, we are expecting a 'bounce back' in water consumption as water security has increased. This would result in a higher proportion of a treated water customer's bill being variable.

transporting bulk water through the Broken Hill Pipeline. That is, the prices we set for WaterNSW to charge its customers (including Essential Water) are an input for our estimate of Essential Water's SRMC. Given our SRMC potentially underestimates the full marginal cost of supplying water because it excludes capital costs, our view is that the current price is within a reasonable range of the true marginal cost of supplying water.

Essential Water submitted that water usage prices should be set with reference to LRMC, and estimated that a plausible range for the LRMC of treated water is $0.77 to $3.03 per kL, based on a range of LRMC estimates for regulated water utilities around Australia[114] and Essential Water's own estimates from the 2014 determination.[115] However, it did not recalculate its marginal costs from the 2014 determination because it considered that the LRMC of the water business would not have changed materially, and that its proposed treated water charge ($1.80 per kL in 2018-19) is within the plausible range.

However, we consider that the construction of the Murray River to Broken Hill pipeline, and the decommissioning of the Menindee pipeline, has significantly impacted the marginal cost of water supply. Therefore, we have recalculated Essential Water's SRMC of supplying water.

No other stakeholder submissions commented on this issue.

## 8.6 Promote consistency in other usage prices

### We made draft decisions

28 To gradually transition the usage price for chlorinated water to $1.58 per kL ($2018-19) over time, as per Table 8.3.

29 To set a single usage price for all untreated water customers of $1.58 per kL ($2018-19).

### Transition the usage price for chlorinated water

Essential Water supplies chlorinated water to local residents in Silverton.

Currently, the usage price for chlorinated water is lower than the usage price for untreated water. However, our analysis of SRMC (see Appendix H) shows Essential Water's cost of supplying chlorinated water is higher than the cost of supplying untreated water. This suggests that the usage price should be at least equal to the untreated water usage prices. As customer affordability is likely to be issue for customers who receive chlorinated water, we decided to gradually transition the chlorinated water usage price to $1.58 per kL in real terms over seven years (Table 8.3). This promotes more cost-reflective prices, while managing potential bill shocks for chlorinated water customers.

Given our draft decision to maintain current service charges for residential customers, the overall bill impacts for chlorinated water customers are likely to be small – including the impact of inflation, bills for these customers would increase by less than 5% a year over determination period (see section 11.1 for discussion on customer impacts).

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

115 We note that Essential Water did not provide IPART with an estimate of LRMC in the 2014 review, although they did assist the Secretariat by providing inputs to estimate the SRMC of water.

**Table 8.3 IPART's draft decision on price transition for chlorinated customers ($2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | 2023-24 | 2024-25 | 2025-26 | 2026-27 |
|---|---|---|---|---|---|---|---|
| Recommended usage price ($/kL) | 1.22 | 1.28 | 1.34 | 1.40 | 1.46 | 1.52 | 1.58 |

**Source:** IPART analysis

### Set a single untreated usage price

Untreated water is currently supplied to a small number of offtake customers from the Menindee and Umberumberka pipelines (pipeline customers), as well as to customers on Essential Water's existing network (non-pipeline customers). The current untreated water usage price is $1.58 per kL for non-pipeline customers and $0.78 per kL for pipeline customers. Our draft decision is to maintain the current price for untreated water at $1.58 per kL in real terms over the determination period, applicable to both pipeline and non-pipeline customers.

At the 2014 Determination, usage prices for pipeline customers were set lower than usage prices for non-pipeline customers. This was to reflect lower costs of supply to service pipeline customers, because they are not on the reticulation network (ie, they are supplied directly from the Menindee pipeline). However, when the Murray River to Broken Hill Pipeline becomes operational, these pipeline customers will receive untreated water from this Pipeline instead, which means that this water will travel through Essential Water's reticulation network from Mica St to Stephens Creek and then to their offtakes.[116]

We consider that the price differential between non-pipeline and pipeline customers will not be justified once the Menindee pipeline is decommissioned, because their marginal cost of supply would be similar. Therefore, our draft decision is to set a single usage price for untreated water, in line with the current price for non-pipeline customers (ie, $1.58 per kL).

Under this draft decision, untreated water usage prices for pipeline customers would roughly double in the first year of the determination period then remain constant in real terms in the remaining two years. We have not set a transition path for pipeline customers, because setting a more cost-reflective charge equalises the costs of doing business for all customers that receive untreated water.

We are seeking comments from stakeholders on our draft decisions to increase chlorinated usage prices and untreated water prices for pipeline customers. We note Essential Water could seek approval from the Treasurer, under section 18(2) of the IPART Act, to charge lower prices than what IPART determines.

#### IPART seeks comment

1 Is our draft decision on usage prices for chlorinated water reasonable?

2 Is our draft decision to set a single usage price for untreated water reasonable?

116 When there is sufficient rainfall in Broken Hill, these customers could also receive water from Stephens Creek reservoir.

## 8.7 Maintain the current pricing approach for mining customers

### We made a draft decision

30 To maintain the approach in the 2014 Determination to set water prices for the mines.

### Our 2014 approach

In the 2014 Determination, we applied the following approach to set prices for the mines:

1. We first determined the mines' share of Essential Water's water revenue requirement, based on the mines' share of total water revenue over the previous period.[117] This was to reflect any change in the mines' share of actual water usage over that period, compared with other customers.
2. The usage charge was set at the same price as for other customers. We then calculated the expected revenue over the 2014 determination period from usage charges using forecast water sales.
3. We then set the mines' service prices to recover the remainder of their share of the water revenue requirement.

We adopted this approach in the 2014 Determination, in line with our view that for very large customers that consume a significant proportion of Essential Water's output, historical water usage is the most suitable allocator of costs for the purpose of setting fixed charges. That is, for the mining customers, we consider that their water usage is the best available indicator of the share of network capacity that is consumed by them.

In 2014, we found that allocating costs to the mines (as a customer group) based on their share of Essential Water's revenue over the recent period approximates the allocation based on the mines' share of historical water usage. We therefore decided to maintain the mines' contribution to Essential Water's revenue at its 2013-14 share of water revenue.

We remain of the view that allocating water costs to the mines customer group on the basis of its share of water revenue over the previous period approximates the allocation based on historical water usage. Relative to allocating costs based on water usage alone, using water revenue is also likely to result in less volatile prices over time and achieve a reasonable degree of price stability.

### Our draft decision is to maintain this approach

We have made a draft decision to maintain our 2014 approach to setting water service prices for the mines:

1. We first calculated the mines' share of historical water revenue using 2015-16 to 2017-18 data. Using three years of historical data is consistent with our draft decision to set prices for three years.

[117] In the 2014 determination, we used the 2013-14 share of water revenue, because the Mines Charges Agreement set prices below cost reflective levels until June 2012.

2. We then calculated the revenue that would have been recovered from maintaining 2018-19 prices for **all customers** over the 2019 determination period. We multiplied the mines' share of historical revenue (in step 1) to this revenue, to set the total water revenue recovered from the mines over the 2019 period.
3. We then set water usage prices at the same price as for other customers and calculated the expected revenue from usage charges using forecast water sales.
4. Lastly, we set services prices to recover the remainder of the mines' share of water revenue. We set service prices for each of the mines individually, using steps 1-4.

We set the mines' share of water revenue based on the revenue that would have been recovered from maintaining 2018-19 prices because we did not consider it appropriate to set mines' prices based on Essential Water's total water revenue requirement. Including the full costs of the Pipeline would result in significant price increases. We also considered the Government's commitment that prices would not rise, in real terms, as a result of the Pipeline. We consider that calculating the mines' prices based on their share of the revenue that would have been recovered by holding all current (2018-19) prices constant, on average, is consistent with this commitment.

Applying this approach results in an increase in the mines' service price of around 20% in 2019-20. Thereafter, service prices would remain unchanged in real terms. The mines' service price has increased because the mines' historical share of total water usage (and hence Essential Water's revenue) has increased. However, the total real bill increase for mining customers is around 9%, which is significantly less than the increase in the water service price. It is also less than Essential Water's proposed increase for these customers.

Essential Water also proposed to maintain the current pricing treatment for a new mine, which we have accepted. That is:

- 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, any new mining customers would pay the same meter-based water service charges as other non-residential customers.

### Stakeholder feedback was mixed

Essential Water proposed to increase prices for existing mining customers by 4.2% per year (in real terms), consistent with the proposed increase for all other customers.[118]

Perilya (Essential Water's largest mining customer) submitted that it has little financial incentive to reduce water consumption due to the high proportion of fixed vs variable charges. Perilya claimed that its most recent water efficiency project has reduced water consumption by 44.8%, which has increased its average unit cost of water. However, Perilya did not specify over what time period this reduction was achieved.

We note that the fixed charges the mines face are influenced by their average historical usage. Therefore, Perilya would face lower fixed charges in subsequent determination periods after

118 Essential Water pricing proposal to IPART, July 2018, p 201.

it reduces its usage, holding all else constant.[119] We consider this to be a reasonable approach that reflects the mines' share of Essential Water's water network costs.

We did not receive comment from any other stakeholders on mines pricing.

[119] That is, if Essential Water's total notional revenue requirement does not increase.

# 9 Sewerage prices

The current structure of sewerage service prices varies by customer category. **Residential customers** pay a fixed sewerage service charge ($ per year), which is the same for houses and apartments. **Non-residential** customers pay a fixed sewerage service charge ($ per year) based on their meter size, set with reference to the 20mm price. These customers also pay a sewerage usage price ($ per kL) for actual sewerage discharge.[120]

For this review, Essential Water proposed to maintain current price structures, and increase all sewerage prices by an average of 4.2% per year, in real terms.

The sections below summarise our draft decisions on sewerage prices, and then discuss these decisions in more detail, including our consideration of Essential Water's proposal and stakeholders' comments.

## 9.1 Summary of our draft decisions on sewerage prices

Table 9.1 sets out our draft decisions on Essential Water's sewerage prices. By comparison, under Essential Water's proposal, all prices would increase by 13.3% over the three years (Table 9.2).

The draft sewerage prices reflect our draft decisions to:

- Maintain constant revenue generated from sewerage prices, on average, over the determination period.
- Maintain the current sewerage usage price of $1.28 per kL in real terms over the determination period.
- Introduce a deemed sewerage discharge allowance of 90 kL per annum for all residential customers, to improve the consistency in prices for residential and non-residential customers.
- Maintain the current approach for setting sewerage prices for mining customers.

Similar to proposed water price increases, stakeholders raised concerns about the ability of the Broken Hill community to afford sewerage price rises.[121]

Several submissions from individual residential customers also expressed concerns regarding the reliability of Broken Hill's sewerage network and believed that proposed price rises were not justified given poor service standards.

Our draft decisions are discussed in sections below. The combined effect of all price structure changes would result in residential customers paying $13.72 less per annum (for service and deemed usage) compared to current prices; and non-residential customers with a 20mm meter paying $183.84 per annum less for service charges compared to current prices, holding usage

120 Some customers also face trade waste charges, which we discuss in Chapter 12.
121 Including Broken Hill Council, Broken Hill Darling River Action Group and the Public Interest Advocacy Centre.

constant. We note that some non-residential customers will pay higher trade waste charges, which is discussed further in Chapters 10 and 11.

**Table 9.1 IPART's draft decisions on Essential Water's sewerage prices ($2018-19– ie, without inflation)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Service Charges ($/year)** | | | | | |
| Residential[a] | 535.73 | 522.01 | 522.01 | 522.01 | -3% |
| Non-residential[b] | | | | | |
| – 20mm connection | 765.00 | 581.16 | 581.16 | 581.16 | -24% |
| – 25mm connection | 1,195.22 | 908.06 | 908.06 | 908.06 | -24% |
| – 40mm connection | 3,060.01 | 2,324.62 | 2,324.62 | 2,324.62 | -24% |
| – 100mm connection | 19,125.08 | 14,528.89 | 14,528.89 | 14,528.89 | -24% |
| **Usage Charges ($/kL)** | | | | | |
| Non-residential | 1.28 | 1.28 | 1.28 | 1.28 | 0% |

**a** We have made a draft decision to introduce a deemed sewerage discharge allowance of 90 kL per annum for residential customers (see section 9.4). This deemed sewerage usage charge has been included in the residential service charge, although it is up to Essential Water whether it bills customers the deemed sewerage discharge allowance as a separate usage charge, or included within the residential service charge.

**b** Non-residential prices assume a 100% discharge factor; bills will depend on discharge factors assigned by Essential Water 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)$^2$x20mm meter charge/400xdischarge factor.

**Table 9.2 Essential Water's proposed sewerage prices ($2018-19 – ie, without inflation)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Service Charges ($/year)** | | | | | |
| Residential | 535.73 | 558.42 | 582.11 | 606.81 | 13.3% |
| Non-residential[a] | | | | | |
| – 20mm connection | 765.00 | 797.74 | 831.59 | 866.88 | 13.3% |
| – 25mm connection | 1,195.22 | 1,246.47 | 1,299.36 | 1,354.50 | 13.3% |
| – 40mm connection | 3,060.01 | 3,190.97 | 3,326.37 | 3,467.51 | 13.3% |
| – 100mm connection | 19,125.08 | 19,943.59 | 20,789.81 | 21,671.93 | 13.3% |
| **Usage Charges ($/kL)** | | | | | |
| Non-residential | 1.28 | 1.33 | 1.39 | 1.45 | 13.3% |

**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)$^2$x20mm meter charge/400xdischarge factor.

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.)

## 9.2 Maintain total revenue from 2018-19 prices

### We made a draft decision

31 To recover the same amount of revenue from sewerage charges, in total, that would have been recovered if 2018-19 prices were maintained.

We decided to set sewerage prices to broadly recover the same amount of total revenue that would be recovered if 2018-19 prices were maintained, adjusted for our draft decisions to:

- Introduce a deemed discharge allowance for residential customers (as discussed in Section 9.4), and
- Exclude the costs of the trade waste services ($377,000 per year, see Chapter 10).

Because we have maintained sewerage usage and service prices in real terms, adjusted for price structure changes, sewerage prices recover more revenue than the sewerage NRR, and water prices recover less revenue than the water NRR (see Table 9.3).

**Table 9.3 IPART's draft decision on revenue from water and sewerage tariffs ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total |
|---|---|---|---|---|
| **Water** | | | | |
| Water NRR | 44.5 | 45.1 | 45.6 | 135.3 |
| Water revenue | 18.0 | 17.9 | 17.9 | 53.8 |
| *Difference* | *-26.6* | *-27.2* | *-27.7* | *-81.5* |
| **Sewerage** | | | | |
| Sewerage NRR | 5.7 | 5.8 | 6.1 | 17.6 |
| Sewerage revenue | 6.6 | 6.6 | 6.6 | 19.8 |
| *Difference* | *0.9* | *0.8* | *0.5* | *2.2* |

We consider that it is more appropriate to maximise price stability for customers, as per customer preferences, rather than remove the cross-subsidy between water and sewerage services. Given that significant capital expenditure is expected in the next determination period (ie, Wills St sewerage treatment plant renewal), an increase in the sewerage NRR is expected in the next determination period. That is, removing the cross-subsidy and decreasing the sewerage service price at this determination could mean a bigger price shock at the beginning of the next determination period.

We consider this decision maximises price stability for customers, and is consistent with the NSW Government funding commitment that prices do not rise in real terms as a result of the Murray River to Broken Hill pipeline (see Chapter 4).

Our price structure change to introduce a deemed sewerage discharge allowance for residential customers has changed the relative sewerage service charges for residential and non-residential customers. Along with the increase in trade waste revenue recovered, sewerage bills for both residential and non-residential customers would be significantly lower than proposed by Essential Water.

## 9.3 Maintain the sewerage usage price

We made a draft decision

32 To maintain the current sewerage usage price of $1.28 per kL in real terms.

Our draft decision is to maintain the current sewerage usage price of $1.28 per kL in real terms over the determination period, to maximise price stability and minimise customer impacts.

We considered setting this price with reference to the short run marginal cost (SRMC) of supplying sewerage services. We estimated the SRMC of supplying sewerage services at $0.22 per kL, based on information provided by Essential Water (see Appendix H). However, we consider that this underestimates the full marginal cost of sewerage services, as it excludes the cost of renewals for capital assets. We excluded these costs because we did not have sufficient information to determine what proportion of these costs vary per kL of sewerage collected, treated and disposed by Essential Water. If we assume 100% of maintenance renewals is marginal, then up to $0.73 per kL could be added to the SRMC estimate for sewerage.

We decided not to depart from the current usage price, because it maximises price stability for customers. Reducing the sewerage usage price closer to our estimate of SRMC would mean an increase in the service price, to recover the total sewerage revenue. Given our other changes to sewerage price structures, this would result in an increase in the share of revenue recovered from residential customers (and a decrease in the share of revenue from non-residential customers).

Furthermore, the information we used to estimate SRMC was insufficient and our estimate is therefore uncertain. We consider that the current price of $1.28 per kL is within a reasonable range, given that our estimate of SRMC could understate the full marginal cost of sewerage services. We note that our estimate of SRMC could understate the LRMC of providing sewerage services, and fluctuate over time.[122]

In principle, we see merit in setting the sewerage usage price with reference to the LRMC of supplying sewerage services. However, to date, sewerage usage prices have usually been set with reference to the SRMC of supplying sewerage services, and there is a lack of information on the LRMC. Over time, we aim to obtain better information to enable us to estimate water utilities' LRMC's of supplying sewerage services.

## 9.4 Introduce a deemed sewerage discharge allowance for residential customers

We made a draft decision

33 To set a standard sewerage service charge for all residential customers, which includes a deemed sewerage discharge allowance of 90 kL per annum.

Currently, non-residential customers with equivalent use to a residential customer pay more for sewerage services than their residential counterparts.

122 Our estimate of SRMC could be updated over time as better information is provided, such as when the Wills St sewerage treatment plant is replaced.

Essential Water proposed to maintain the current price structure, under which:

- 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).

Under this structure, a residential customer who discharges 90 kL per year (the reported annual average discharge for residential customers as reported by Essential Water)[123] pays a sewerage service charge of $536 ($2018-19). However, a non-residential customer on a 20mm meter with a discharge factor of 70%[124] who also discharges 90 kL pays a service charge of $536, **plus** sewerage usage charges of $115, resulting in a total sewerage bill of $651 per year.[125]

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 decided to restructure sewerage prices as outlined in Table 9.4. Under the new price structure:

- Residential customers would pay a fixed (or deemed) sewerage usage charge that reflects Essential Water's estimate of average residential sewerage discharges (90 kL per annum). That is, residential customers would pay a charge equal to 90 kL multiplied by the sewerage usage charge. This amount would be included in the residential fixed sewerage service charge.
- Non-residential customers would continue to pay a sewerage usage charge based on their water usage multiplied by their discharge factor and the sewerage usage price.
- The sewerage usage price (per kL) would be the same for both residential and non-residential customers.

**Table 9.4 IPART's draft decision on sewerage price structures**

| | Residential customers | Non-residential customers |
|---|---|---|
| Usage charge | Deemed at 90 kL per annum for all customers (ie, 90 kL times the sewerage usage price). This amount is incorporated into the fixed service charge below. That is, residential customers do not face an explicit sewerage usage charge. | Calculated as actual water usage times that customer's discharge factor, times the sewerage usage price.<br>*No change to the current approach* |
| Fixed charge | Standard charge applied to all residential customers that is calculated as: 20mm meter charge x 70% discharge factor + deemed 90 kL of sewerage usage | Meter based charge (20mm meter equivalence) times the individual discharge factor.<br>*No change to the current approach* |

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

124 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.)

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

In the following subsections we discuss the reasons for:

- Our recommended pricing structure, and
- Setting the deemed usage amount for residential customers at 90 kL per annum.

### Introducing a deemed usage component for residential customers

For non-residential customers, water usage can be used as a proxy for sewerage usage.[126] For residential customers, it is not practical to meter sewerage usage, and water usage may not be a highly correlated proxy for sewerage usage. That is, increased water usage for a particular household is likely to be associated with higher discretionary use (eg, gardens), and limited discharge to the sewerage system. Using the average residential sewerage discharge is an available proxy of sewerage usage for residential customers, which would ensure that residential and non-residential customers who impose similar costs on the system would pay similar prices, on average.

Essential Water did not support introducing a deemed sewerage usage component to residential bills, because its customer feedback suggested that 55% of residential customers would not be prepared to pay $10 to reduce the price differential between residential and non-residential customers.[127] No other stakeholder submissions specifically commented on this issue.

We consider that introducing a deemed usage component for residential customers is appropriate primarily because it is more cost-reflective. Both residential and non-residential customers impose costs on the sewerage system when they discharge. The marginal cost of supplying sewerage services does not differ between residential and non-residential customers. Therefore, both residential and non-residential customers should face sewerage usage prices (noting the discussion above regarding sewerage not being metered).

In addition, we consider that introducing this component would be:

- Unlikely to have a major impact on customers – under draft prices, total residential water and sewerage bills increase in line with inflation (at an annual average increase of 2.2% per year). See Chapter 11 for analysis on bill impacts.
- Simple to implement.
- More consistent with how we set sewerage charges for other utilities, including Sydney Water and Hunter Water.

### Setting the deemed discharge allowance for residential customers at 90 kL per annum

Essential Water estimates that average residential sewerage discharge is 90 kL per year, and we accept this estimate. However, we note that it is significantly lower than average residential water usage (260 kL per year).[128] This would imply a discharge factor of about 35%, which is half the 70% discharge factor assumed when setting residential service prices.

126 The NSW Department of Industry has established benchmark discharge factors that can be applied to different types of non-residential customers.
127 Essential Water pricing proposal to IPART, July 2018, p 195.
128 Essential Water pricing proposal to IPART, July 2018, p 26.

In our view, a deemed amount of 90 kL per annum is appropriate as a transitional measure. Although this estimate may be somewhat conservative, given average water usage, a lower deemed amount reduces the impact of the change on residential bills in this price review. We would encourage Essential Water to further refine its estimate of average residential sewerage discharges at the next price review.

## 9.5 Reduce sewerage service prices

After calculating the revenue from trade waste charges and sewerage usage charges, sewerage service charges are calculated as a residual to recover Essential Water's efficient costs of providing sewerage services.

Our draft decision is to set the sewerage service charge at $522.01 for all residential customers (houses and apartments), inclusive of the deemed discharge allowance of 90 kL per year. We have also decided to set the base 20mm sewerage service change at $581.16 for non-residential customers.

Non-residential customers pay sewerage service charges that are meter based and have discharge factors applied. We set a base 20mm meter charge and then non-residential customers with a 20mm meter will pay that price multiplied by a discharge factor (which is assigned by Essential Water). The charges for larger meter sizes are then calculated with reference to the 20mm meter base charge using the formula: (meter size)$^2$x20mm meter charge/400 x discharge factor. The non-residential service charges presented in Table 9.1 assume a 100% discharge factor – however, actual bills will depend on each customer's discharge factor.

## 9.6 Maintain the sewerage service charge for the mines

### We made a draft decision

34 To maintain the current pricing approach for the mines' sewerage service charge.

Essential Water currently charges each of the mines the sewerage service charge applicable to a 100mm meter with a 100% discharge factor (Table 9.2 above).[129] In its modelling of prices, Essential Water has proposed to maintain its current approach. No other stakeholder submissions commented on this issue.

We decided to accept Essential Water's proposal to set the mines' charge for sewerage services at a single 100mm meter charge (with a 100% discharge factor). At the 2014 Determination, our expenditure review consultant examined Essential Water's approach to charging mines for sewerage services.[130] It noted that:

- An outflow meter was installed by the mines which meant that actual discharges could be measured accurately and charged appropriately using the sewerage usage price.

129 At the 2014 Determination, we accepted Essential Water's existing approach at the time of charging the mines a 100mm meter sewerage service charge, where the discharge factor to be applied would be assigned by Essential Water.

130 Sinclair Knight Merz, Strategic Management Overview and Review of Operating and Capital Expenditure for Essential Energy's water and sewerage business in Broken Hill, Final Report, 26 January 2014.

- Total sewerage discharges from the mines represented a small proportion (2%) of all sewerage volumes treated by Essential Water.

Given that the provision of sewerage services to the mines represented a small amount of overall revenue, our consultant considered that it was unlikely that a detailed investigation and a potentially more complex approach would result in materially different charges. Therefore, our consultant found Essential Water's approach to be reasonable.

We note that the current situation is largely unchanged, and that the mines are subject to trade waste charges for higher strength discharges. Therefore, we consider it reasonable to maintain the current approach.

We also note that the mines would pay a lower sewerage service charge compared to 2018-19, due to the price structure changes we have made.

# 10 Prices for other services

In this chapter, we present and explain our draft prices for the trade waste, miscellaneous and recycled water services supplied by Essential Water. We also discuss our draft decisions for unmetered and unconnected properties.

Essential Water's trade waste services are supplied to a subset of non-residential customers. Currently, the costs of providing trade waste services are not recovered from trade waste customers (with the exception of mining customers which are charged for trade waste). We received very limited stakeholder feedback on trade waste services and are interested to hear stakeholder views in response to the draft prices.

We engaged a specialist consultant – Marsden Jacobs Associates (in partnership with Inside Infrastructure; MJA) – to advise us in our review of these prices. The sections below summarise our draft decisions, Essential Water's proposal, MJA's assessment and our assessment. We then explain how the revenue from these prices is subtracted from the NRR.

## 10.1 Summary of our draft decisions on trade waste and miscellaneous prices

Our draft decisions would encourage Essential Water to charge customers receiving trade waste services, to remove a current cross-subsidy where customers who do not discharge trade waste effectively pay too much for sewerage services. Specifically, we have made draft decisions to:

- Introduce volume-based trade waste prices, by transitioning to the Department of Industry's recommended default volume-based prices over a 10-year period.
- Remove the existing mass-based trade waste prices in the 2014 determination, as Essential Water is currently unable to recover trade waste costs on this basis.
- Subtract $377,000 in trade waste revenue in each year of the determination – our estimate of the full revenue Essential Water would have recovered if it levied the Department of Industry's volume-based prices. Our view is customers who do not receive trade waste services should not pay for these costs.

For miscellaneous charges, we have accepted Essential Water's proposed prices and forecasts. We have also accepted Essential Water's proposal to treat recycled water services as non-regulated revenue.

We then discuss our draft decisions that unmetered properties should pay the standard residential water and sewerage service charges, plus a deemed level of water consumption. Lastly, we outline our draft decision that unconnected properties should not pay water and sewerage services charges.

## 10.2 Trade waste charges

Trade waste is wastewater from commercial and industrial customers with concentrations of pollutants that exceed a domestic equivalent. Trade waste charges contribute only a small part of Essential Water's revenue.

### We made draft decisions

35 To introduce volume-based trade waste prices by transitioning to the NSW Department of Industry's recommended default prices.

36 To remove the mass-based trade waste prices from the 2014 Determination.

37 To set the maximum prices Essential Water can charge for trade waste services as set out in Appendix J.

38 To remove $377,000 per year from Essential Water's sewerage Notional Revenue Requirement (NRR) to reflect our estimate of Essential Water's costs of treating trade waste.

In the following subsections we discuss Essential Water's proposal, MJA's findings, and the reasons for our draft decisions. Stakeholders did not comment specifically on Essential Water's trade waste charges.

### 10.2.1 Essential Water's proposal

Essential Water 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).

Essential Water currently only charges mining customers trade waste charges.[131] It has forecast trade waste revenue at approximately **$2,000 per annum** ($2018-19) over the determination period.

### 10.2.2 Marsden Jacob Associates analysis

As part of our review, we engaged MJA to assess Essential Water's trade waste and miscellaneous charges and revenue forecasts for the 2019 determination period. This is the first time we have had a consultant review trade waste charges in detail for Essential Water.

MJA found that Essential Water's proposed prices and charges do not appear to be based on the capacity of its trade waste system to transport, treat or dispose of waste, and cannot be shown to be cost-reflective.[132]

MJA analysed trade waste flows and loads of treatable pollutants, and how the costs for sewerage treatment can be assigned on a flow and load basis. MJA estimated that approximately 13% of flows in Essential Water's sewerage catchments may be trade waste related. Based on an assessment of volumetric based trade waste charges, MJA estimated that

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

132 Marsden Jacob Associates, Review of proposed prices for trade waste and miscellaneous prices – Essential Water, February 2019, p 4.

Essential Water should be recovering **between $370,000 and $534,000 per annum** from trade waste customers.[133]

MJA noted that its analysis was constrained by the quality and quantity of information provided by Essential Water. Therefore, MJA recommended that Essential Water should not apply its own calculated volumetric charge until it has collected better data. Rather, MJA proposed that – in the absence of better data on the costs of providing trade waste services – these prices could be set with reference to the Department of Industry's guidelines for trade waste charging,[134] with a transition period of 10 years.

Essential Water did not provide any comments or raise any concerns with MJA's review of trade waste charges.

### 10.2.3 Introduce volume-based trade waste prices

We consider MJA's findings and recommendations to be reasonable. We also understand that Essential Water's current under-recovery reflects a number of factors:

- Essential Water supplies trade waste services to around 270 trade waste customers,[135] but only levies an annual trade waste fee on two customers (Perilya and CBH). It does not recover any trade waste revenue from other trade waste customers.
- Our 2014 determination included annual charges and mass-based prices (ie, the weight of particular materials in trade waste discharge that require additional treatment). However, Essential Water is currently unable to measure sewerage inflows from customers on this basis.
- Our 2014 determination did not include volume-based prices (ie, per kL of sewerage discharge from trade waste customers), except for Category 1a and 2 customers.[136] However, Essential Water does not currently levy these charges.

However, because Essential Water is not recovering the costs of trade waste services from these customers, all other residential and non-residential customers are implicitly paying for the treatment of trade waste, regardless of whether they actually discharge trade waste or not. This is not cost-reflective, as customers who are imposing costs on the system by discharging trade waste are not directly paying for those services. Since trade waste revenue is removed from Essential Water's revenue requirement prior to setting other prices, the current under-recovery means that other customers are paying more than their efficient costs of sewerage services.

We consider that Essential Water is able to measure and collect revenue on a volume basis. Other utilities that we regulate, such as Sydney Water and Hunter Water, have volume-based charges in their determinations.

133 Marsden Jacob Associates, Review of proposed prices for trade waste and miscellaneous prices – Essential Water, February 2019, p 8.
134 Department of Primary Industries, Liquid Trade Waste Regulation Guidelines, April 2009.
135 Marsden Jacob Associates, Review of proposed prices for trade waste and miscellaneous prices – Essential Water, February 2019, p 8.
136 The 2014 determination sets 4 different trade waste charging categories: 1, 1a, 2 and 3. The higher the category, the higher the risks of discharge to the sewerage system. For example, category 3 charges are intended for large, industrial dischargers.

Therefore, we have accepted MJA's recommendation to set trade waste prices with reference to the NSW Department of Industry's default volume-based charges, with a 10 year transition path to increase prices for volume-based charges. The transition period is intended to minimise the impact of sudden price changes on trade waste customers. The transition period also allows Essential Water to consult its trade waste customers on how it can best collect data[137] to establish the efficient cost of providing trade waste services, and how best to levy charges. We recommend that Essential Water conducts customer consultations in the 2019-22 determination period, to better understand customer impacts and inform its prices for its next price proposal.

We have set draft prices (Appendix J) for both volume-based charges and annual fixed charges as follows:

- Transition to the Department of Industry's default volume-based charges over 10 years (10% per year). These volume-based trade waste charges would be in addition to sewerage charges.
- Set the annual fixed charge for trade waste equal to the Department of Industry's default prices for non-mining customers, and maintain the current fixed charge (in $2018-19 terms) for mining customers. These Department of Industry default annual charges would be less than $200 per year for most trade waste customers, and are slightly lower than the current fixed charges in our 2014 determination.

If Essential Water levied these charges, we estimate that it would recover between $90,000 to $154,000 each year, over the 2019 determination period (Table 10.1).

**Table 10.1 Trade waste revenue estimates – IPART draft decision compared to Essential Water's forecast and MJA's recommendation ($000, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|
| Essential Water forecast | 2.2 | 2.3 | 2.4 |
| MJA recommended | 37 | 74 | 111 |
| **IPART draft decision** | **90** | **122** | **154** |
| Volume-based | **32** | **64** | **96** |
| Annual fees | **58** | **58** | **58** |

**Source:** Essential Water pricing submission to IPART, June 2018; Marsden Jacob Associates, Review of Proposed prices for trade waste and miscellaneous services – Essential Water, February 2019; IPART analysis.

### 10.2.4 Remove mass-based trade waste prices

We have removed trade waste prices for excess mass charges. These charges were included in our 2014 determination, but Essential Water does not currently measure or levy trade waste charges on this basis. We support MJA's recommendation that Essential Water should collect trade waste quality data from Category 3 customers[138] over a 3-year period, to support the calculation of mass-based charges. Once data is available, we will consider whether setting mass-based charges is appropriate in the next determination period.

137 Essential Water could collect data to support its proposed charges at the next pricing proposal, such as annual fees, application fees, reinspection fees and volumetric usage charges.

138 Category 3 customers are large, industrial dischargers that impose high costs on the sewerage treatment system.

### 10.2.5 Exclude the costs of supplying trade waste from the NRR

We have also made a draft decision to subtract $377,000 per year (starting in 2019-20) from Essential Water's sewerage notional revenue requirement, before setting sewerage prices for all non-residential and residential customers. This is our forecast of the revenue Essential Water would have recovered from trade waste customers, if the Department of Industry's default volume-based charges applied. It is our best available estimate of the costs of supplying trade waste services to these customers.

We have made the draft decision to exclude our estimate of the full costs of treating trade waste from the Notional Revenue Requirement, because we consider that other customers should not bear these costs.

In addition, while Essential Water may not have been able to levy the current mass-based charges in the 2014 determination, our view is that it would have been able to levy the other trade waste prices to these customers.

#### We recommend

3 That Essential Water should conduct customer consultations, ahead of the next determination period, to better understand the costs of treating trade waste and the prices that should be set to recover these costs.

#### IPART seeks comment

3 Are our draft decisions on trade waste charges reasonable?

## 10.3 Miscellaneous charges

#### We made a draft decision

39 To set the maximum prices Essential Water can charge for miscellaneous services as set out in Appendix K.

Essential Water provides a range of miscellaneous services to its water and sewerage customers, generally for one-off services such as connections and disconnections, replacing damaged services, plumbing inspections, site inspections and building plan approvals. These charges are levied on a relatively small number of customers, as they are incurred (ie, as the service is provided).

While miscellaneous charges represent a small impact on Essential Water's costs and revenue, they can represent significant costs to a small number of customers. Stakeholders did not comment specifically on Essential Water's miscellaneous charges.

### 10.3.1 Essential Water's proposal

Essential Water currently recovers approximately $109,000 per annum from miscellaneous charges. Three charges account for over 80% of forecast revenue from miscellaneous charges:

- Conveyancing certificates with meter reads
- Drainage diagrams, and

- Personal service of final warning notice for late payment prior to restriction.

Essential Water proposed keeping its miscellaneous charges constant in real terms, ie, indexed by inflation.

### 10.3.2 Marsden Jacob Associates analysis

MJA assessed Essential Water's miscellaneous charges and revenue forecasts for the 2019 determination period.

MJA assessed whether direct cost and overheads are efficient and directly related to the delivery of the service. MJA did not recommend any changes from Essential Water's proposed unit prices and revenue forecasts.

While some of Essential Water's actual costs to deliver the services are higher than its proposed prices, MJA's analysis suggests that Essential Water's proposed unit prices reflect the efficient cost to deliver the services. In particular, the proposed prices for conveyancing certificates and drainage diagrams are more comparable, than Essential Water's actual costs, to the current charges for similar services provided by other water businesses.

MJA also recommended that Essential Water should review its current practices for final warning notices to ensure its processes for managing its late paying customers and bad debts are efficient. We understand that individual warning notices are delivered in person, which is unlikely to be cost efficient.

Essential Water did not provide any comments or raise any concerns with MJA's recommendations on miscellaneous charges.

### 10.3.3 IPART's analysis

We consider that MJA's findings and recommendations are reasonable. Our draft decision is to accept MJA's recommendations on miscellaneous charges, and adopt Essential Water's proposed prices and revenue forecasts.

## 10.4 Recycled water pricing

We made a draft decision

40 Not to set effluent water prices, and to accept Essential Water's proposal that 50% of the forecast revenue from effluent water sales is shared with customers.

Essential Water currently supplies recycled water (also known as effluent water) to eight customers, by treating water collected from its sewer reticulation network.

### 10.4.1 Essential Water's proposal

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

To do this, we deduct 50% of the expected revenue from effluent water from the revenue to be recovered through prices for sewerage services, before prices are calculated. This means lower prices for customers, and allows Essential Water to retain 50% of the revenue.

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 customers.[139]

In our 2014 determination, to reflect Essential Water's charging practice at that time, we decided to treat effluent water as a non-regulated 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.

### 10.4.2 IPART's analysis

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 draft decision is not to set maximum recycled water prices for Essential Water as part of Essential Water's 2019 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.

We note that Essential Water's recycled water customers are 'voluntary' and the draft position in our recycled water review is to **not** set prices for these customers unless we are requested to do so.

We did not receive comment from stakeholders specifically on setting recycled water prices.

## 10.5 Prices for unmetered properties

We made draft decisions

41 To set water prices for all unmetered residential and non-residential customers as:

- The standard residential water service charge, plus
- A water usage charge for a deemed consumption of 300 kL per year, for the applicable water quality.

42 To set sewerage prices for all unmetered residential and non-residential customers as the standard residential sewerage service charge (which includes a deemed usage of 90 kL per year).

139 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.

The 2014 Essential Water determination set prices for all unmetered residential and non-residential customers. Essential Water's pricing proposal did not explicitly discuss unmetered properties, and we did not receive any stakeholder comments about these properties.

Consistent with the current approach, our draft decision is that unmetered residential and non-residential properties will pay the standard residential water service charge, plus a deemed level of water consumption.

The average level of residential consumption over the 2014 Determination period was around 260 kL per annum.[140] Therefore, we have maintained the deemed consumption at 300 kL per year, which potentially provides an incentive for small water users to have a meter installed. This is consistent with the approach we apply for the other utilities we regulate.[141]

Following the same approach, our draft decision is that unmetered residential and non-residential properties will pay the standard residential sewerage service charge, which includes a deemed usage of 90 kL per year (as discussed in Section 8.6).

## 10.6 Prices for unconnected properties

### We made draft decisions

43 To set water service charges for properties not connected to the water supply system to zero.

44 To set sewerage service charges for properties not connected to the sewerage system to zero.

Essential Water may levy water and sewerage service charges to unconnected properties under the *Water Management Act 2000*, as long as in the utility's opinion it is reasonably practicable for water and sewerage services to be provided to that land.[142] Unconnected properties represent about 3% of Essential Water's customer base.

By contrast, water and sewerage service charges are set to zero for unconnected properties in the Sydney Water and Hunter Water 2016 Determinations.

Most of Essential Water's unconnected properties are vacant land, and Essential Water currently charges water and sewerage service charges to these properties. It also proposed to maintain its existing approach.

However, we understand that in practice, Essential Water has difficulty in recovering these charges, especially when owners cannot be traced. This creates additional expenses for Essential Water to pursue debt recovery.

We did not receive any stakeholder submissions about unconnected properties.

140 Essential Water pricing proposal to IPART, July 2018, 2018, p 26.

141 For example, our Sydney Water and Hunter Water reviews (see IPART, Review of prices for Hunter Water Corporation – Final report, June 2016, p 143; IPART, Review of prices for Sydney Water Corporation – Final Report, June 2016, pp. 177-178).

142 Section 311 of the *Water Management Act 2000* (NSW).

Our draft decision is that properties that are not connected to the water or sewerage system should not pay water or sewerage service charges.[143] We consider this to be a pragmatic approach that recognises that generally:

- Properties that are not connected to the water or sewerage system are not directly imposing costs on Essential Water's network, and that
- Properties that have been disconnected due to non-payment of fees should not continue to be levied water or sewerage service charges.

143 Under our draft decision, if a property is not connected to the sewerage system but is connected to the water supply system, then it would be charged an applicable water service charge, vice versa. Properties that are not connected to both the water and sewerage system, would not face any water and sewerage service charges.

# 11 Customer bill impacts of our pricing decisions

This chapter outlines the bill impacts of our draft pricing decisions for Essential Water's customers. Bills have been calculated using the draft prices set out in Chapters 8 to 10.

Throughout this report, figures have generally been presented in real dollars ($2018-19), including our draft prices. However, for each year of the 2019 determination period, our prices will be indexed in line with inflation and the bills actually paid by customers will be based on nominal prices (that is, including the effects of inflation).

Therefore, in this chapter we present the impact of our draft decisions on customer bills in nominal dollars, unless stated otherwise. This means that we have included the impact of our estimate of inflation (6.8% over the 3-year period)[144] on future prices. This is to assist customers in understanding the likely impact of our draft prices on their bills throughout the 2019 determination period, including the effects of inflation.

In summary, under our draft decisions:

- Most residential customers would see their annual treated water and sewerage bill increase by slightly less than inflation
- Chlorinated water customers would see their bills increase by more than inflation
- Most non-residential customers would also see their annual treated water and sewerage bill increase by less than inflation
  - Except for those with applicable trade waste charges whose bills could increase substantially if Essential Water levies these charges as per our draft decision on prices (as discussed in Chapter 10)
- Bills for mining customers would increase, reflecting their higher historical share of water usage, and
- Non-residential pipeline customers would see their untreated water bill increase by about 100% over three years (including inflation), to be consistent with other untreated water customers.

Under Essential Water's proposal, prices would have generally increased by around 6.8% per year including inflation, or around 20% over three years.

## 11.1 Impacts for residential customers

Table 11.1 presents indicative water and sewerage bills for different residential customers under our draft prices. Actual bill impacts for customers will depend on their water usage.

Over the 2019 determination period, the annual water and sewerage bill for a residential customer with **treated water** usage of 200 kL per year would increase by about $69 (or 6%)

144 This is based on forecast inflation of 1.7% for 2019-20 and then 2.5% per year thereafter. This results in a cumulative expected inflation of 6.8% over the 3 years.

over the 3-year determination period. The increase is less than inflation due to sewerage service charges decreasing marginally in real terms for residential customers. Whilst our draft decision to introduce a 90 kL per year discharge allowance would otherwise increase service charges, it has been more than offset by our draft decision to subtract the full costs of trade waste before setting sewerage prices (discussed in Chapter 9 and 10 respectively).

Over the 2019 determination period, a household consuming 200 kL per year of **chlorinated water** would see its annual water bill increase by around $76 (or 14%) in nominal terms. This represents an average increase of $25 per year. The increase is due to the increase in usage prices for chlorinated water, which, as discussed in Chapter 8, reflects our draft decision to transition this price towards the untreated water usage price.

**Table 11.1 Residential annual water and sewerage bills under draft prices ($nominal)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Residential – treated water – non pensioner** | | | | | |
| 200kL | 1,223 | 1,230 | 1,261 | 1,292 | 6% |
| 300kL | 1,403 | 1,413 | 1,448 | 1,485 | 6% |
| 400kL | 1,583 | 1,596 | 1,636 | 1,677 | 6% |
| **Residential – treated water – pensioner** | | | | | |
| 200kL | 1,048 | 1,055 | 1,086 | 1,117 | 7% |
| 300kL | 1,228 | 1,238 | 1,273 | 1,310 | 7% |
| 400kL | 1,408 | 1,421 | 1,461 | 1,502 | 7% |
| **Residential – chlorinated water (water bills only as no sewerage services are provided)** | | | | | |
| 200kL | 560 | 581 | 608 | 636 | 14% |
| 300kL | 676 | 705 | 741 | 779 | 15% |
| 400kL | 792 | 829 | 875 | 922 | 16% |

**Note:** Bills are calculated assuming individual 20mm meter connections. Bill impacts include our estimate of cumulative inflation of 6.8% over the 2019 determination period.

**Source:** Essential Water pricing model, September 2018 (based in $2018-19); IPART analysis.

## 11.2 Impacts for non-residential customers

Non-residential customer bill impacts would depend on their meter size and discharge factors, as well as their individual water usage.

Under our draft prices, treated water and sewerage bills for businesses would generally increase by less than inflation, mainly due to the reduction in sewerage service charges. Sewerage service charges have decreased for non-residential customers by more than residential customers, because we have:

- Included a discharge allowance of 90 kL per year in residential customers' sewerage service charges, and
- Increased the trade waste revenues to be collected by Essential Water.

These changes mean less revenue needs to be collected through non-residential sewerage service charges.

Table 11.2 shows the indicative water and sewerage bill impacts on businesses with differing meter sizes and levels of water consumption. A typical non-residential customer consuming 2,100 kL of treated water per year would see a water and sewerage bill increase of $71 or 1% over the 3-year determination period.

Untreated water (non-pipeline) customers would see their annual water bill increase approximately in line with inflation, whereas pipeline (offtake) customers would see bills increase by about 85% over three years (see Section 11.3 below for details).

**Table 11.2 Non-residential annual water and sewerage bills under draft prices ($nominal)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Non-residential – treated water** | | | | | |
| 20mm with 250kL usage | 1,537 | 1,432 | 1,468 | 1,505 | -2% |
| 25mm with 1,000kL usage | 4,045 | 3,907 | 4,007 | 4,105 | 1% |
| 40mm with 2,100kL usage | 9,114 | 8,742 | 8,966 | 9,185 | 1% |
| 80mm with 21,000kL usage | 70,427 | 69,492 | 71,281 | 73,016 | 4% |
| **Non-residential – untreated water[a] (water bills only as no sewerage services are provided)** | | | | | |
| 20mm with 250kL usage | 723 | 736 | 754 | 773 | 7% |
| 25mm with 1,000kL usage | 2,092 | 2,131 | 2,184 | 2,239 | 7% |
| 40mm with 2,100kL usage | 4,629 | 4,714 | 4,832 | 4,953 | 7% |
| 80mm with 21,000kL usage | 38,423 | 39,142 | 40,121 | 41,124 | 7% |

[a] 2018-19 bills calculated using 2018-19 usage prices for non-pipeline customers. From 2019-20 onwards both non-pipeline and pipeline customers pay the same price.

**Note:** Bill impacts include our estimate of cumulative inflation of 6.8% over the 2019 determination period.

Sewerage service charges for non-residential customers are based on water meter size. The applicable meter charge is set using the formula: (meter size)$^2$x20mm meter charge/400.

We have calculated service charges for larger meter sizes using this formula, based on Essential Water's stated 20mm price. We have estimated bills using a standard discharge factor of 70% discharge factor, as indicated in Essential Energy's pricing proposal (p 200). Actual bills will depend on discharge factors for individual customers.

**Source:** Essential Water pricing model, September 2018 (based in $2018-19); IPART analysis.

For some non-residential customers, the sewerage bill decrease would be offset by the introduction of trade waste charges, if Essential Water decides to levy these charges as per our draft prices for trade waste (see Appendix J).[145] We have estimated trade waste discharge volumes based on standard discharge factors recommended in the NSW Department of Industry's trade waste regulation guidelines.[146]

Table 11.3 presents indicative sewerage and trade waste bills for a range of businesses, assuming a 20mm meter and average water consumption of 2,100 kL per annum. For example, a bakery's combined sewerage and trade waste bill would increase by about 22% over 2018-19 to 2021-22 under our draft prices.[147] While Table 11.3 presents bills assuming

145 The 2014 determination set maximum prices for trade waste services, but Essential Water did not actually levy trade waste charges on customers (except the mines).

146 NSW Department of Industry, Liquid Trade Waste Regulation Guidelines, April 2009, p306.

147 Assuming single 20mm meter, 2,100 kL of water usage and 70% discharge factor.

the same consumption for all business types (ie, 2,100kL per annum), actual bills will depend on individual usage volumes, which are likely to vary between different businesses.

We encourage Essential Water to conduct customer consultation during the 2019 determination period, to better understand customer impacts and inform its pricing structures for trade waste charges going forward. We also welcome any direct stakeholder feedback on the bill impacts of our draft trade waste charges.

**Table 11.3 Indicative combined annual sewerage and trade waste bills under draft prices ($nominal)**

| | Trade waste discharge factor (%) | 2018-19 | 2019-20 | 2020-21 | 2021-22 | % change 2018-19 to 2021-22 |
|---|---|---|---|---|---|---|
| Bakery | 25 | 2,417 | 2,616 | 2,783 | 2,952 | 22% |
| Butcher | 90 | 2,417 | 2,861 | 3,301 | 3,741 | 55% |
| Patisserie | 50 | 2,417 | 2,710 | 2,982 | 3,255 | 35% |
| Car wash | 70 | 2,417 | 2,786 | 3,142 | 3,498 | 45% |
| Mechanic | 70 | 2,417 | 2,786 | 3,142 | 3,498 | 45% |
| Restaurant | 50 | 2,417 | 2,710 | 2,982 | 3,255 | 35% |
| Service station | 70 | 2,417 | 2,786 | 3,142 | 3,498 | 45% |

**Note:** Sewerage service charges for non-residential customers are based on water meter size. Non-residential service prices also assume a 70% discharge factor, bills will depend on discharge factors for individual customers. We have estimated sewerage bills based on 20mm meters and 2,100 kL of annual water consumption.

The trade waste discharge factor is set using the formula: (liquid trade waste/total water consumption)x100. We have calculated volumetric charges using the discharge factor. We have also assumed that businesses are classified as Category 2 customers, for the purposes of estimating fixed annual charges.

Bill impacts include our estimate of cumulative inflation of 6.8% over the 2019 determination period.

**Source:** IPART Analysis.

## 11.3 Impacts for untreated water (pipeline) customers

Water bills for pipeline customers would increase under our draft prices, due to an increase in the usage price from the current $0.78 per kL to $1.58 per kL ($2018-19) from 2019-20 onwards.

Information provided by Essential Water[148] shows that in aggregate, pipeline customers are forecast to use 77,000 kL of untreated water annually. There are 11 customers along the Menindee pipeline, plus a small number along the Umberumberka pipeline. We understand that some customers have multiple meters on their properties.

There are a total of 46 meters, ranging in size from 20mm to 50mm. The majority of meters are 25mm (28 out of 46 meters).

Table 11.4 presents indicative bill impacts for untreated water (we note these bills are for water only as pipeline customers do not receive sewerage services). Actual bills will depend on meter sizes and individual usage. Because pipeline customers have relatively high usage, we estimate bill increases of about 100% over three years to 2021-22.

148 Essential Water Annual Information Return, July 2018.

**Table 11.4 Pipeline customer water bills under draft prices ($nominal)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | Change 2018-19 to 2021-22 |
|---|---|---|---|---|---|
| **Pipeline customers – untreated water** | | | | | |
| 20mm with 2,000kL usage | 1,888 | 3,553 | 3,642 | 3,733 | 98% |
| 25mm with 4,000kL usage | 3,632 | 6,961 | 7,135 | 7,313 | 101% |
| 40mm with 8,000kL usage | 7,551 | 14,213 | 14,568 | 14,933 | 98% |
| 50mm with 14,000kL usage | 12,968 | 24,623 | 25,238 | 25,869 | 99% |

**Note:** Service charges for pipeline customers are based on water meter size. The applicable meter charge is set using the formula: (meter size)$^2$x20mm meter charge/400. We have calculated service charges for larger meter sizes using this formula, based on Essential Water's stated 20mm price.

Bill impacts include our estimate of cumulative inflation of 6.8% over the 2019 determination period.

**Source:** Essential Water pricing model (based in $2018-19); IPART Analysis.

We consider that the increase in usage price for pipeline customers is appropriate, because the costs to supply pipeline and non-pipeline customers are similar for untreated water (see Section 8.6). Therefore, we consider that pipeline customers (and other customers across the network) should pay the same price as non-pipeline customers.

However, we seek stakeholder input on bill impacts and affordability for pipeline customers.

# 12 Implications of pricing decisions

This chapter outlines implications of our draft pricing decisions for Essential Water and other matters that we must consider under the IPART Act (see Appendix A), including:

- Essential Water's service standards
- Essential Water's financial viability and shareholders
- General inflation, and
- The environment.

We are satisfied that the 2019 Draft Determination achieves an appropriate balance between these matters.

## 12.1 Implications for Essential Water's service standards

Under our draft determination, we expect Essential Water to achieve both operating and capital efficiency savings, and are satisfied that Essential Water can achieve these savings. We consider Essential Water would receive sufficient revenue, if it receives our recommended NSW Government funding contribution, to achieve service standards at or above those expected by customers and to meet the standards required by its regulators.

Essential Water considered its proposal would permit it to provide services in accordance with regulatory requirements. This was based on its proposed operating and capital expenditure.[149]

Our draft decision on Essential Water's efficient expenditure is lower than Essential Water's proposed expenditure, to take account of efficiencies.

In our decision on Essential Water's capital program, its proposed projects have largely been maintained.[150] Our decision provides funds for Essential Water to plan and deliver its capital program at a lower cost in this determination period, while further improvements to options analysis are undertaken to better demonstrate the efficiency of expenditures. Aither found that whilst there was a substantial improvement in Essential Water's asset management system since IPART's 2014 Determination, it could be further improved through documentation of practices, improving the application of risk/cost analysis in option reviews for significant projects and addressing inconsistencies in the quality of business cases.[151]

We note that following robust options analysis, if actual expenditure over the 2019 determination period is higher than what we have allowed, and we deem it to be prudent when we next review prices (which will be at the end of the 2019 determination period), then

149 Essential Water, IPART submission, July 2018 p 17.

150 We note that we have adjusted the timing of certain expenditures, eg, for Essential Water's proposal to replace the Wills St sewerage treatment plant, as we consider that further investigation and planning is required by Essential Water to establish the efficient amount of expenditure required.

151 Aither, Essential Water expenditure review – Final Report, January 2019, p 15.

we will include this expenditure in Essential Water's RAB so that it can earn a return on assets and depreciation through prices at the next determination.

We therefore consider that our expenditure allowances would permit Essential Water to meet service standards expected by customers and to continue to meet the requirements of its regulators.

## 12.2 Implications for Essential Water's financeability

Before finalising our pricing decisions, we undertake a financeability test to assess how our pricing decisions are likely to affect the business's financial sustainability and ability to raise funds to manage its activities over the upcoming regulatory period.

In 2018, we reviewed the financeability test we use as part of our price regulation process.[152] In this review, we decided to:

- Conduct a financeability test if the prices we set determine the revenues of the business and if the business has, or is part of an entity with, a distinct capital structure
- Broaden the test by calculating financeability tests for both the benchmark and actual business
- Adjust the target ratios used to assess financeability
- Clarify the process to identify any financeability concerns
- Tailor the remedy for a financeability concern based on its source.

The 2018 financeability test will apply to pricing decisions on or after 1 July 2019.

To assess Essential Water's financeability over the 2019 determination, we analysed its forecast financial performance, financial position and cash flows for both the benchmark and actual business. We then forecast financial ratios for both tests and assessed Essential Water's financial ratios to our target ratios.

The three financial ratios we include in our financeability test, and the target ratios, are summarised in Table 12.1.

**Table 12.1 Target ratios for the benchmark and actual test**

| Ratio | Benchmark test (real cost of debt) | Actual test (actual cost of debt) |
|---|---|---|
| Interest cover | >2.2x | >1.8x |
| Funds from operations (FFO) over debt | >7.0% | >6.0% |
| Gearing | <70% | <70% |

**Source:** IPART analysis.

152 IPART, Review of our financeability test, November 2018, p 1.

### The financeability test is done for Essential Water's notional revenue requirement for its water and sewerage business only

We have conducted the financeability tests using the revenues and costs for Essential Water only (ie, as opposed to Essential Energy as a whole). This is consistent with our draft decisions for Essential Water's tax allowance and post-tax WACC parameters.

However, because Essential Energy was unable to provide disaggregated financial information (eg, debt gearing and interest expense) for Essential Water only, we did not have all the information required to accurately conduct the actual test. As a result, when conducting the actual test we have used debt gearing and interest expense information for Essential Energy as a whole.

In addition, we assume that Essential Water would recover our full Notional Revenue Requirement (NRR) for the water and sewerage businesses. That is, we assume our recommended NSW Government funding contribution is accepted.

### The benchmark test indicates no financial concern for Essential Water

Under our draft NRR, an efficient benchmark business would exceed our target ratio for the Real Interest Cover Ratio (RICR) and gearing ratio over the regulatory period (see Table 12.2). While the benchmark business's real FFO over debt would be slightly below our target ratio, this trend of this ratio shows an improvement over the period.

Taken together, these results suggest no financeability concern for the benchmark business. They suggest that our draft prices would allow an efficient investment grade rated business to raise debt finance, have sufficient operating cash flows to service this debt, and remain financeable during the regulatory period.

**Table 12.2 Financial ratios for the benchmark test**

| Ratio | Target | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|
| Real Interest Cover | >2.2x | 2.7 | 2.9 | 3.0 |
| Real FFO over Debt | >7.0% | 5.6% | 6.0% | 6.4% |
| Real Gearing | <70% | 60% | 60% | 60% |

**Source:** IPART analysis.

### The actual test indicates some concerns due to a high actual cost of debt and gearing

In considering the impact of our decisions on the actual business, we note that Essential Water's total NRR represents less than 3.6% of Essential Energy's revenue. The revenue collected from Essential Water's customers is 1.9% of Essential Energy's customer revenue. This suggests that the prices we set for Essential Water would not materially impact the financial viability of Essential Energy as a whole.

As noted above, we did not have all the information required to accurately conduct the actual test for Essential Water. As a proxy for this information, we have calculated financial ratios using the cost of debt and debt gearing of Essential Energy. However, we have exercised caution in interpreting the results of the actual test, due to these assumptions.

Using the actual financial information provided by Essential Energy, our draft NRR would result in:

- An interest coverage ratio (ICR) below the target ratio
- A FFO over Debt ratio well-below the target ratio, and
- A gearing ratio marginally higher than our target ratio (Table 12.3).

**Table 12.3 Financial ratios for the actual test**

| Ratio | Target | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|---|
| Interest cover | >1.8x | 1.5 | 1.3 | 1.3 |
| FFO over Debt | >6.0% | 2.5% | 2.0% | 2.1% |
| Gearing | <70% | 73% | 73% | 74% |

**Source:** IPART analysis.

Our analysis shows that this is largely due to a high actual cost of debt and gearing. The average nominal cost of debt was 7.1% for Essential Water, compared to a nominal BBB-rated cost of debt of 5.6% in the WACC for this review.

If Essential Water maintained a benchmark gearing ratio, and if its debt raising costs matched our estimate of the cost of debt in the WACC, our analysis suggests that the actual business's financeability would improve to meet the target for the ICR and gearing ratios. The FFO over Debt ratio would be below the target but trend up to be just short of the target in 2021-2022.

Our analysis shows that our draft NRR would allow a benchmark business to remain financeable over the regulatory period. And while the financeability test using actual financial information does not meet our target ratios, this can largely be explained by the high cost of debt and gearing of the business. Accordingly, we do not consider any adjustment is necessary.

Furthermore, Essential Energy and NSW Treasury can consider the results of our tests to address any actual financeability concerns the business may face as a result of its financing and investment decisions.

## 12.3 Impact on the Consolidated Fund

Under Section 16 of the IPART Act, IPART is required to report on the likely impact to the Consolidated Fund if prices are not increased to the maximum levels permitted. If this is the case, then the level of tax equivalents and dividends paid to the Consolidated Fund will fall. The extent of this fall will depend on NSW Treasury's application of its financial distribution policy and how the change affects after-tax profit.

Our financial modelling is based on a tax rate of 30% for pre-tax profit and dividend payments at 70% of after-tax profit. Under our modelling, a $1 decrease in pre-tax profit would result in a loss of revenue to the Consolidated Fund of 49 cents in total, which is 70% of the decrease in after-tax profit of 70 cents.

If Essential Water sought the Treasurer's approval under section 18(2) of the IPART Act to charge below the maximum prices of the determination then, if requested, we could provide advice on the likely impact to the Consolidated Fund.

We have also recommended a NSW Government contribution of $78 million over the 3-year determination period to Essential Water. This amount is net of any tax implications – that is, we consider that any tax implications of the NSW Government contribution is a matter between the NSW Government and Essential Water.

## 12.4 Implications for the environment

The NSW Government is responsible for determining the risk of negative impacts of Essential Water on the environment, and imposing standards or requirements to address these risks and minimise any impacts.

For example, the Office of Environment and Heritage is responsible for setting standards for, and monitoring the environmental impacts of, the effluent Essential Water discharges from its treatment plants and sewerage systems.

Essential Water's environment-related programs include:

- Water savings initiatives, including the provision of educational resources to manage water consumption, and active monitoring of high water accounts and customer visits to address water consumption.
- The re-use of partially treated wastewater (effluent water) for non-drinking purposes, which is sold to a range of customers in selected areas of Broken Hill.[153]

In determining Essential Energy's revenue requirements, we have ensured it can fully recover all efficient costs it incurs in meetings its environmental obligations.

## 12.5 Implications on general inflation

Under Section 15 of the IPART Act, we are required to consider the effect of our determinations on general price inflation. As the Australian Bureau of Statistics (ABS) does not collect data on Essential Energy's water and sewerage impact on the consumer price index, we have derived an estimate of their impact on general price inflation using the ABS estimate of Sydney Water's impact on the consumer price index (CPI).

Currently, water and sewerage prices in Sydney contribute about 0.76% towards the consumer price index (all groups, 8 capital cities).[154] Using Essential Energy's customer numbers (around 11,000) relative to Sydney Water's (around 1,900,000) we estimate the relative contribution of Essential Energy towards general inflation to be about 0.004%.

Under our decisions, the annual average increase in the water and sewerage bill for a customer consuming 200 kL of water per year is -0.5% (in real terms). Therefore, the annual impact on general nation-wide price inflation is negligible.

153 http://www.essentialwater.com.au/content/services, accessed 1 March 2019.
154 Australian Bureau of Statistics, Consumer Price Index – 2018 Weighting Pattern, December 2018.

# 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

l) Standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).

Table A.1 outlines the sections of the report that address each matter.

**Table A.1 Consideration of section 15 matters by IPART**

| Section 15(1) | | Report reference |
|---|---|---|
| a) | the cost of providing the services | Chapter 4 sets out the total efficient costs Essential Water would incur to deliver its services (including the Pipeline transportation costs and consequential works). Further detail is provided in Chapters 5 and 6 on prudent historical expenditure and efficient forecast expenditure. |
| b) | the protection of consumers from abuses of monopoly power | We consider our draft decisions would protect consumers from abuses of monopoly power, as they reflect the efficient costs Essential Water requires to deliver its services (less our recommended NSW Government contribution).<br>This is addressed throughout the report, particularly in Chapter 4, and Chapters 8 and 9 (where we set out our draft pricing decisions). |
| c) | the appropriate rate of return and dividends | Chapter 4 and Appendix F outline that we have allowed a market-based rate of return on debt and equity, and that this would enable a benchmark business to return an efficient level of dividends to its owner. |
| d) | the effect on general price inflation | Chapter 12 outlines that the impact of our draft prices on general inflation is negligible. |
| e) | the need for greater efficiency in the supply of services | Chapters 5 and 6 set out our draft decisions on Essential Water's prudent historical expenditure and efficient forecast expenditure, including that we have incorporated an on-going efficiency adjustment to its operating expenditure. Further, Chapter 3 discusses our draft decision to introduce an 'efficiency carryover mechanism' to encourage Essential Water to identify further efficiencies. |
| f) | ecologically sustainable development | Chapter 5 and 6 set out Essential Water's prudent historical expenditure and efficient forecast expenditure that allows it to meet all of its regulatory requirements, including its environmental obligations. |
| g) | the impact on borrowing, capital and dividend requirements | Chapter 4, Chapter 12 and Appendix F explain how we have provided Essential Water with an allowance for a return on and of capital, and our assessment of its financeability. |
| h) | 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 | Chapters 5 and 6 determines Essential Water's prudent historical and forecast efficient expenditure, including the efficient costs of any contracted works to deliver its capital expenditures. |
| i) | need to promote competition | In determining efficient costs, we have been mindful of relevant principles such as competitive neutrality (eg, we have included a tax allowance for Essential Water as set out in Chapter 4). However, we have also been mindful of the NSW Government's commitment and have recommended a contribution as set out in Chapter 4. This means that our draft prices recover less than Essential Water's efficient costs, and would be below the prices expected to prevail in a competitive market. |
| j) | considerations of demand management and least cost planning | Chapter 8 and 9 outline how we have set usage prices with reference to marginal cost to send price signals to consumers about the impact of their demand on Essential Water's supply capacity. Chapters 5 and 6 outline how we have assessed Essential Water's prudent historical and efficient forecast expenditure required to manage its supply capacity at least cost. |

| | | |
|---|---|---|
| k) | the social impact | Chapter 11 and 12 considers the potential impact of our draft pricing decisions on Essential Water, its customers and the NSW Government (on behalf of the broader community). |
| l) | standards of quality, reliability and safety | Chapters 5, 6 and 12 detail our assessment of Essential Water's prudent historical and efficient forecast costs so that it can meet the required standards of quality, reliability and safety in delivering its services.<br>Section 12.1 discusses implications of our draft decisions on Essential Water's service standards. |

# 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*.[155] 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.[156]
  - Oversees the performance of Local Water Utilities based on the requirements of the *NSW Best-Practice Management of Water Supply and Sewerage Guidelines*.[157]
  - 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*.

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

156 DoI 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*.)

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

# C What prices would be affordable?

In our Issues Paper, we outlined a framework for setting prices in this review, which included analysis so that the prices we set would be affordable for customers. Setting water and sewerage services in Broken Hill so that they are affordable, given the potential impact that the new Pipeline would have on prices, has been a key issue throughout our review.

Numerous stakeholders highlighted the socioeconomic circumstances of Broken Hill which generally impacts customers' ability to pay - particularly given that Broken Hill has, compared with the rest of NSW, a large number of part-time workers, pensioners, those on low incomes and those receiving income support.[158]

In November 2018, the NSW Government announced that it would subsidise the efficient costs of the Pipeline for a 4-year period, so that prices would not rise for end-use customers in real terms as a result of the Pipeline.[159] We have considered this announcement in setting prices, and recommended a Government funding contribution.

As prices for almost all customers would not rise in real terms, and our view is that current prices are affordable, we consider that our draft prices are affordable for customers.

Nevertheless, in this appendix we outline what prices could be affordable for residential customers, by benchmarking prices and incomes in Broken Hill, to other areas.

## C.1 Essential Water considered what is affordable for customers

Essential Water submitted that its pricing proposal was informed by its stakeholder engagement with customers in Broken Hill (which included both residential customers and businesses).[160] Essential Water indicated that setting affordable prices was one of the most important factors for customers, as well as the provision of reliable water and sewerage services and safe drinking water.[161]

In its proposal, Essential Water undertook benchmarking of residential water and sewerage bills and noted that the average annual water and sewerage bill in Broken Hill (of $1,223) was ranked 11th lowest out of the 36 water utilities it examined across Australia (where the average water and sewerage bill was $1,369).[162] However, it also noted that Broken Hill has a high proportion (22%) of its population that is 65 years of age or older, and that the ABS analysis

158 For example, IPART, Review of Essential Energy's prices for water and sewerage services in Broken Hill and WaterNSW's prices for the Broken Hill Pipeline – Transcript, November 2018, pp 33, 40, 53; Broken Hill City Council, Submission to Issues Paper, October 2018, pp 3-4; PIAC, Submission to Issues Paper, November 2018, pp 1-3.

159 NSW Government, Letter to the Chair – IPART, 21 November 2018. Available at: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-water-services-metro-water-legislative-requirements-prices-for-essential-energys-water-and-sewerage-services-in-broken-hill-from-1-july-2019/letter-from-the-minister-on-the-broken-hill-pipeline.pdf

160 Essential Water pricing proposal to IPART, July 2018, p 6.

161 Essential Water pricing proposal to IPART, July 2018, p 14.

162 Essential Water pricing proposal to IPART, July 2018, p 15.

of 'Relative Socio-economic Disadvantage' placed it in the lowest 10% band in Australia and in NSW.[163] These concerns were also raised in response to our Issues Paper and at the public hearing in Broken Hill.

Essential Water also submitted that addressing what is affordable for customers and the impacts on disadvantaged customers would continue to be an important issue for the community.[164] Thus, it stated that it had considered this in developing its proposal, and had scrutinised its expenditure plans to ensure they were both necessary and efficient, to minimise the pressure on prices. With this in mind, Essential Water proposed increases of 4.2% per year (in real terms) for all customers, excluding the transportation costs of the Pipeline and consequential works.[165]

## C.2 What residential customers can afford to pay

We examined a range of measures to assess how affordable water and sewerage services are in Broken Hill compared to other areas. We looked at:

- Median income levels, as well as the composition of customers who have incomes below the median income level
- The proportion of customers seeking financial assistance or are on welfare payments
- The percentage of those on payment assistance plans, and
- Typical water and sewerage bills.

These various measures were outlined in our Issues Paper.[166]

We have further analysed water and sewerage bills against median incomes across regional NSW. For our analysis, we have focussed on:

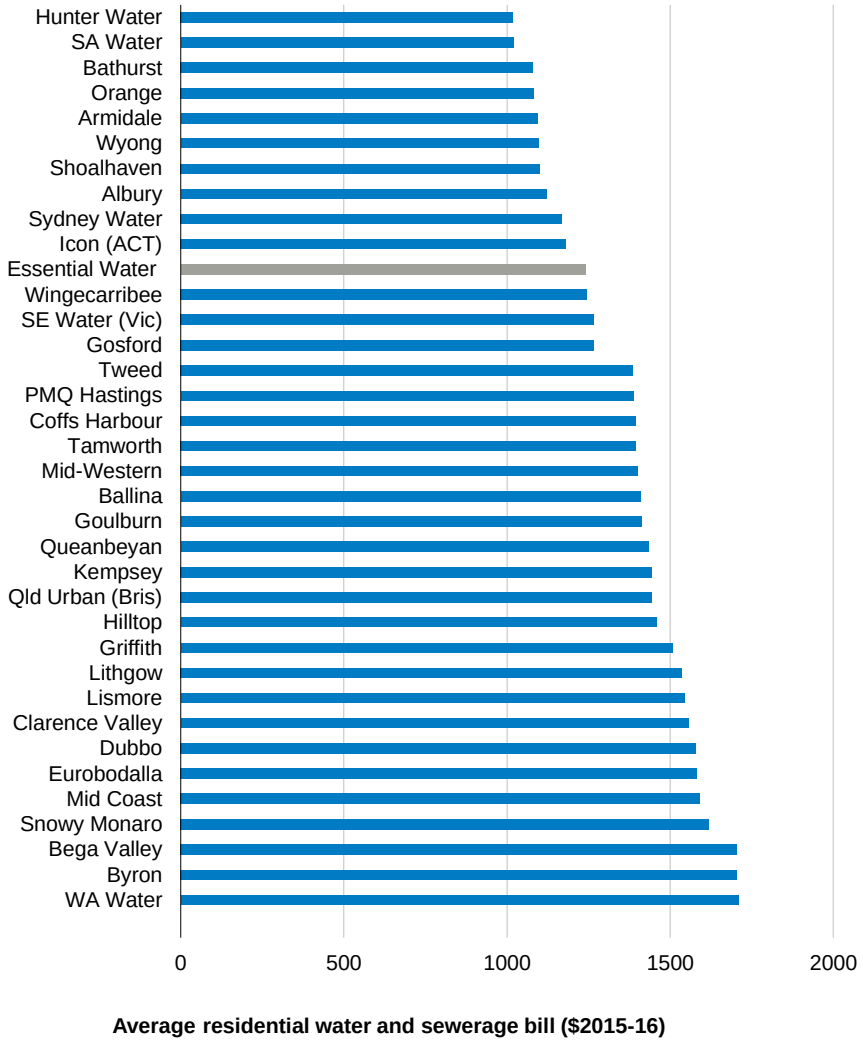
- Median incomes, rather than average incomes. Stakeholder also raised the importance of examining median income levels when assessing what is affordable, rather than average income levels, given the disparity in incomes between those who work in the mines and those who do not.[167] We note that there are many customers in Broken Hill on lower incomes (including the pension) and receiving income support.
- The 'average' water use that customers in each area consume, rather than assuming the same level of water usage across all areas. This is to recognise that different regions may require varying levels of water usage for particular uses. For example, for customers in Broken Hill, a certain portion of water consumption is used to address health concerns, such as supressing lead dust pollution. Hence, water needs in Broken Hill can be higher than other regions and it is important to be mindful of these issues when considering what customers in Broken Hill can afford to pay.

163 Essential Water pricing proposal to IPART, July 2018, p 8.
164 Essential Water pricing proposal to IPART, July 2018, pp 8,25.
165 Essential Water pricing proposal to IPART – Addendum to pricing proposal, September 2018, p 1.
166 IPART, Review of Essential Energy's prices for water and sewerage services in Broken Hill – Issues Paper, September 2018, pp 34-40.
167 IPART, Review of Essential Energy's prices for water and sewerage services in Broken Hill and WaterNSW's prices for the Broken Hill Pipeline – Transcript, November 2018, pp. 32; Broken Hill Darling River Action Group Inc, Submission to Issues Paper, October 2018, p 2.

- Median incomes and average water and sewerage bills for 2015-16, given that the latest census data is from 2016. For 2015-16, the average residential water usage reported to the 2015-16 NSW water supply and sewerage benchmarking report was 233 kL per year for Essential Water.

In Figure C.1, we compared current water and sewerage bills in Broken Hill to other regional areas. This analysis suggests that average bills are lower in Broken Hill than the average across most other utilities.

**Figure C.1 Essential Water bills and rankings compared against other utilities ($2015-16, real)**



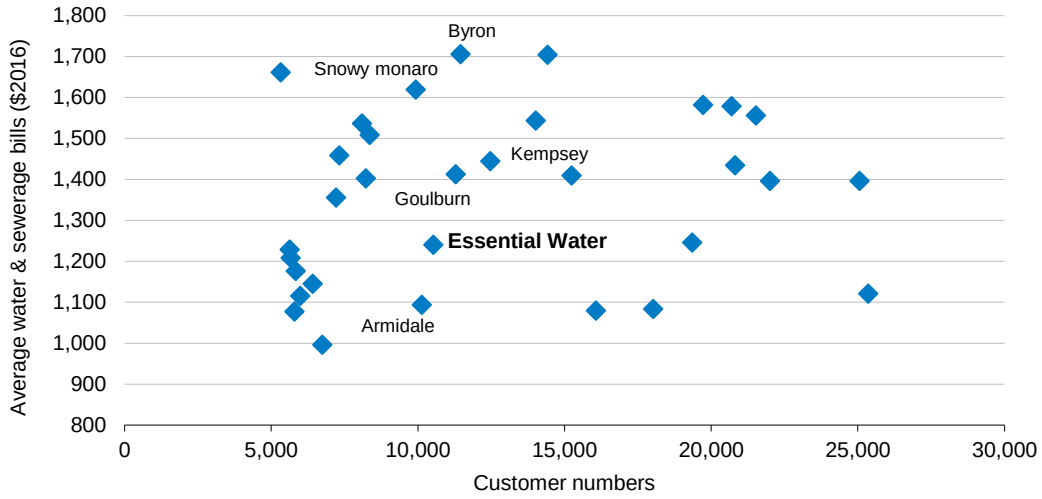

**Note**: We have used average water usage for Essential Water, reported as 233 kL by Essential Water to the NSW water supply and sewerage benchmarking report.

**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.

To account for the impact of utility size on cost, we compared average water and sewerage bills in Broken Hill to other similar sized utilities in NSW (Figure C.2). This suggests that

Essential Water's current bills are comparable with other similar sized utilities, with some utilities having slightly lower average bills (eg, Armidale), as well as others having higher average bills (eg, Goulburn).

**Figure C.2 Comparison of average residential water and sewerage bills by customer numbers ($2015-16, real)**



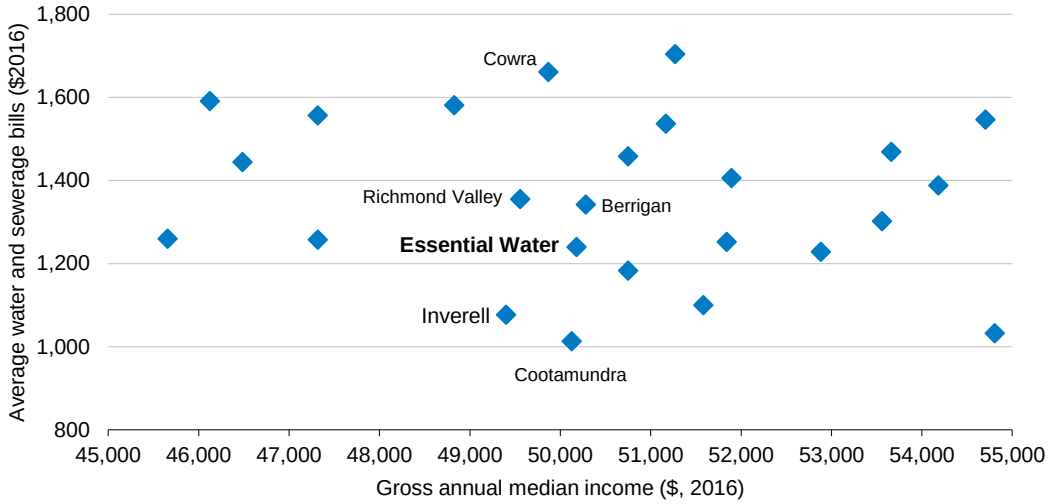

**Note:** 'Average' is based on the average residential usage for each utility as reported to DPI. For Essential Energy it has been reported as 233kL; for Armidale 207kL; for Goulburn 162kL; for Kempsey 149kL for Snowy Monaro 151kL; and for Byron 169kL.

**Source:** 2015-16 NSW Water Supply and Sewerage Benchmarking Report, p 116; ABS, Census of Population and Housing, Australia 2016.

Then, to account for the impact of median incomes, Figure C.3 compares how average bills compare to other NSW utilities with similar median incomes. Again, it suggests that Essential Water's current bills are comparable with other areas that have similar median incomes. In particular, there are other utilities (eg, Cowra) with similar median incomes that have higher bills.

Figure C.3 does not suggest a clear link between the cost of supplying water and sewerage services compared with median income levels. Instead, differences in water bills likely reflect the underlying differences in the costs of supplying these services across areas.

**Figure C.3 Comparison of average residential water and sewerage bills by gross annual median income ($2015-16, real)**

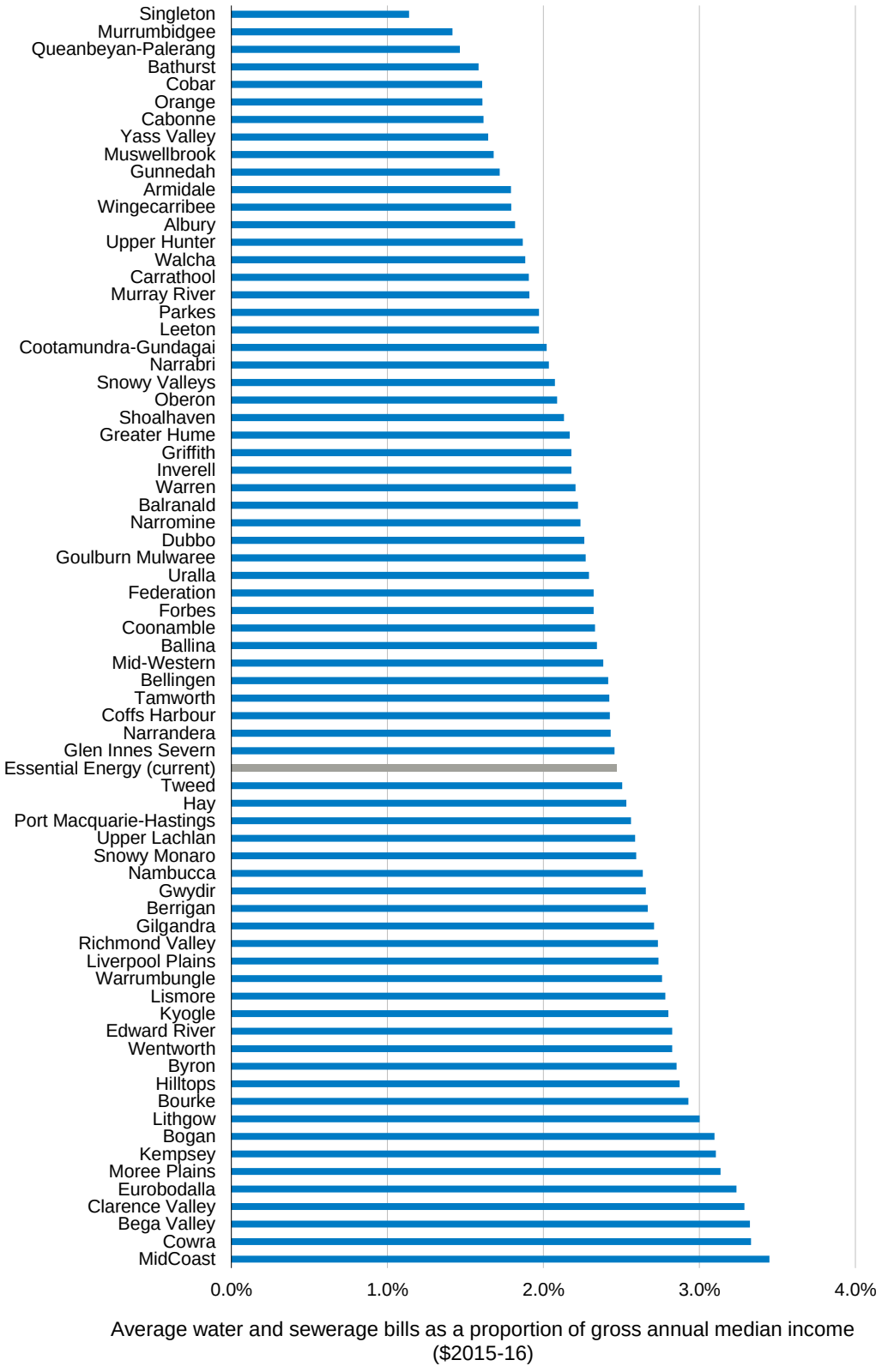



**Source:** 2015-16 NSW Water Supply and Sewerage Benchmarking Report, p 116; ABS, Census of Population and Housing, Australia 2016.

In Figure C.4, we compared current water and sewerage bills in Broken Hill as a share of median incomes to other regional areas. Water and sewerage bills in Broken Hill are about 2.5% of median income, which is comparable with the average across all other regional NSW utilities.[168] Average bills are less than 3% of income for most utilities.

168 Bills as a percentage of median income is also about 2.5% (see IPART, Review of Essential Energy's prices for water and sewerage services in Broken Hill – Issues Paper, September 2018, p 37).

## Figure C.4 Essential Water bills as a proportion of gross annual median income compared with other utilities ($2015-16, real)




**Source:** 2015-16 NSW Water Supply and Sewerage Benchmarking Report, p 116; ABS, Census of Population and Housing, Australia 2016.

We consider that currently bills are generally affordable for residential customers in Broken Hill compared with other regional areas – as noted previously, bills represent about 2.5% of median income in Broken Hill. Although, given that average bills are less than 3% of median income for most utilities, we consider that bills would continue to remain affordable if they are at, or below, 3% of the median income in Broken Hill.

We note the NSW Government's commitment to subsidise the efficient costs of the Pipeline is for four years, until 2022-23.

We note that many customers in Broken Hill are on lower incomes (including the pension). The capacity to pay of pensioners is likely to be less than the average residential customer. However, this is true irrespective of whether pensioners are in Broken Hill or in other areas. Therefore, the current impact of water and sewerage prices on pensioners in Broken Hill, relative to the water and sewerage bills paid by pensioners in other regions is likely to be similar to Figure C.1 to Figure C.4. That is, the average water and sewerage bills in Figure C.1 to Figure C.4 would all be reduced by $175 for pensioners (ie, the pensioner rebate)[169] but adjusted for differing average water usage for pensioners in each region.

169 Essential Water provides the same rebate to pensioners (of $175) as other Councils in regional NSW providing water and sewerage services.

# D The Efficiency Carryover Mechanism

In this Appendix, we explain why an Efficiency Carryover Mechanism (ECM) would remove an incentive for the utility to delay efficiency savings it identifies during a regulatory period until the beginning of the following period. It provides worked examples of how the ECM removes this incentive by identifying efficiency savings that are permanent, and allowing the utility to retain permanent efficiencies savings for the same amount of time, regardless of when they are implemented by the utility. For example, for a 3-year determination, any permanent efficiency savings would be retained for three years.

Sections D.1 and D.2 below compare the 'profits' that a utility would enjoy if it implemented a permanent efficiency saving under the current regulatory framework, with those available under the ECM. Section D.3 explains how the ECM is applied. Section D.4 explains why we implement the ECM with a 1-year lag.

## D.1 Current regulatory framework

The three tables in Figure D.1 show the profits that a regulated utility retains after making an efficiency improvement **decrease** the further into a regulatory period that the efficiency is made. The efficiency is then incorporated into the regulatory allowance – in the form of lower prices to customers – in the next determination period and the utility gains no more profit from that efficiency. This creates the incentive for the utility to delay efficiencies to the first year of a new regulatory period.

Figure D.1 assumes that an efficiency saving implemented by a utility in the final year of a determination would be identified by IPART in the expenditure review process.

**Figure D.1 How the current framework incentivises delaying efficiencies**

**Permanent saving made in year 1**

| | Regulatory Period 1 | | | Regulatory Period 2 | | |
|---|---|---|---|---|---|---|
| Year | 1 | 2 | 3 | 4 | 5 | 6 |
| | $ | $ | $ | $ | $ | $ |
| Allowance | 100 | 100 | 100 | 80 | 80 | 80 |
| Actual | 80 | 80 | 80 | 80 | 80 | 80 |
| Annual profit | 20 | 20 | 20 | - | - | - |
| **Total profit in period** | | **60** | | | | |

**Permanent saving made in year 2**

| | Regulatory Period 1 | | | Regulatory Period 2 | | |
|---|---|---|---|---|---|---|
| Year | 1 | 2 | 3 | 4 | 5 | 6 |
| | $ | $ | $ | $ | $ | $ |
| Allowance | 100 | 100 | 100 | 80 | 80 | 80 |
| Actual | 100 | 80 | 80 | 80 | 80 | 80 |
| Annual profit | - | 20 | 20 | - | - | - |
| **Total profit in period** | | **40** | | | | |

**Permanent saving made in year 3**

| | Regulatory Period 1 | | | Regulatory Period 2 | | |
|---|---|---|---|---|---|---|
| Year | 1 | 2 | 3 | 4 | 5 | 6 |
| | $ | $ | $ | $ | $ | $ |
| Allowance | 100 | 100 | 100 | 80 | 80 | 80 |
| Actual | 100 | 100 | 80 | 80 | 80 | 80 |
| Annual profit | - | - | 20 | - | - | - |
| **Total profit in period** | | **20** | | | | |

**Note:** Regulatory period 2 does not necessarily have to be the same length as previous regulatory period. We have not made a decision on the length of the subsequent regulatory period. The tables in this figure are illustrative only.

## D.2 How the ECM removes the incentive to delay savings

The ECM removes the incentive to delay savings by allowing the utility to retain profits for each permanent saving as though the saving were made in year 1 of the determination period in the scenario above. That is, the total profit for the utility is the same regardless of which year the efficiency was made.

The three tables in Figure D.2 demonstrate the ECM for a 3-year determination. Using the same example as in Figure D.1, the utility retains a $60 profit regardless of which determination year it makes the saving in. This is because we calculate a "carryover" into the next determination period.

After three years, the saving is passed onto customers.

**Figure D.2 How the ECM removes incentives to delay efficiencies**

| | Regulatory Period 1 | | | Regulatory Period 2 | | |
|---|---|---|---|---|---|---|
| **Permanent saving made in year 1** | | | | | | |
| Year | 1 | 2 | 3 | 4 | 5 | 6 |
| | $ | $ | $ | $ | $ | $ |
| Base allowance | 100 | 100 | 100 | 80 | 80 | 80 |
| Actual | 80 | 80 | 80 | 80 | 80 | 80 |
| Permanent saving | 20 | 20 | 20 | - | - | - |
| Incremental saving | 20 | 20 | 20 | - | - | - |
| Carryover calc | N/A | N/A | N/A | | | |
| Net allowance | 100 | 100 | 100 | 80 | 80 | 80 |
| Annual profit | 20 | 20 | 20 | - | - | - |
| **Total profit in period** | | 60 | | | | |
| **Permanent saving made in year 2** | | | | | | |
| Year | 1 | 2 | 3 | 4 | 5 | 6 |
| | $ | $ | $ | $ | $ | $ |
| Base allowance | 100 | 100 | 100 | 80 | 80 | 80 |
| Actual | 100 | 80 | 80 | 80 | 80 | 80 |
| Permanent saving | - | 20 | 20 | - | - | - |
| Incremental saving | - | 20 | 20 | - | - | - |
| Carryover calc | | | 20 | 20 | | |
| Net allowance | 100 | 100 | 100 | 100 | 80 | 80 |
| Annual profit | - | 20 | 20 | 20 | - | - |
| **Total profit in period** | | 40 | | | 20 | |
| **Permanent saving made in year 3** | | | | | | |
| Year | 1 | 2 | 3 | 4 | 5 | 6 |
| | $ | $ | $ | $ | $ | $ |
| Base allowance | 100 | 100 | 100 | 80 | 80 | 80 |
| Actual | 100 | 100 | 80 | 80 | 80 | 80 |
| Permanent saving | | | 20 | | | |
| Incremental saving | | | 20 | | | |
| Carryover calc | | | | 20 | 20 | |
| Net allowance | 100 | 100 | 100 | 100 | 100 | 80 |
| Annual profit | - | - | 20 | 20 | 20 | - |
| **Total profit in period** | | 20 | | | 40 | |

**Note:** Regulatory period 2 does not necessarily have to be the same length as previous regulatory period. We have not made a decision on the length of the subsequent regulatory period. The tables in this figure are illustrative only.

## D.3 Applying the ECM

If the utility decides to apply the ECM, the utility would need to calculate the following values:

- **Under (over):** first the utility identifies the difference between the base allowance set by IPART to its actual expenditure.
- **Outperformance:** second, the utility only reports where it underspends against our allowances (overspends are omitted).
- **Permanent gain:** working backwards from year 3 to year 1, the utility then determines how much of the outperformance in year 3 also occurred in year 2, how much of the outperformance that occurred in both year 3 and 2 occurred in year 1.

- **Incremental gain:** working forwards from year 1 to 3, it then determines the first year that a permanent saving occurred. It is this 'incremental gain' in each year that would be carried forward for three years through the ECM calculation that follows.
- **ECM calculations:** ensures that any incremental gain is carried forward and held for three years.

At the next determination period, we would consider these calculations, and decide whether the savings identified by the utility are permanent.

## D.4 Why there is a 1-year lag in implementation

In practice, at the time we undertake our review, we only have a forecast of expenditure in the final year of the determination period.

To address this limitation, we make three adjustments.

First, we lag the implementation of the ECM by one year. For example, with a 4-year determination period, we apply the ECM calculation to the first three years of the current determination period (years 1, 2, and 3), and to the final year of the previous regulatory period (ie, year 0). Efficiency savings in the final year of the current period (year 4) would be included in the ECM calculation for the following determination period.

Second, we assume an efficiency saving made in year 3 is permanent. Therefore, the benefit is held in year 3 and year 4, and the ECM allows the benefit to be carried forward in years 5 and 6.

Figure D.3 shows the first two adjustments. In this example, the two regulatory periods are years 1 to 4 (regulatory period 1), and year 5 to 8 (regulatory period 2). The ECM is then applied to operating expenditure in Years 0 to 3 in the first regulatory period, and years 4 to 7 in the second.

**Figure D.3 ECM is lagged one year so that it is based on actuals**

| | | Regulatory Period 1 | | | | Regulatory Period 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ECM1 | | | | ECM2 | | | | |
| Year | - | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| Base allowance | 100 | 100 | 100 | 100 | 100 | 80 | 80 | 80 | 80 |
| Actual | 100 | 100 | 100 | 80 | 80 | 80 | 80 | 80 | 80 |
| Under (over) | - | - | - | 20 | 20 | - | - | - | - |
| Outperformance | - | - | - | 20 | 20 | - | - | - | - |
| Performance gain | - | - | - | 20 | | | | | |
| Incremental gain | - | - | - | 20 | | | | | |
| ECM1 calc | | | | | | | | | |
| - year 0 | - | - | - | - | - | | | | |
| - year 1 | | - | - | - | - | - | | | |
| - year 2 | | | - | - | - | - | - | | |
| - year 3 | | | | 20 | 20 | 20 | 20 | - | |
| ECM benefit | | | | | | 20 | 20 | | |
| Total allowance | | 100 | 100 | 100 | 100 | 100 | 100 | 80 | 80 |
| Total gain (loss) | | - | - | 20 | 20 | 20 | 20 | - | - |

**Source:** IPART analysis.

The third adjustment made is to ensure that any efficiency made in the final year of a determination period is only retained for one regulatory period, in present value terms. This is because we review efficiency savings made in the final year of a determination in the following period. For example, with a 4-year determination period, it is five years before we review this expenditure. Therefore, the utility would have retained these cost savings for five years.

Figure D.4 shows that we would calculate a 'year 0 adjustment' to ensure permanent savings made in the last year of a determination are only held for the length of the determination period, in this example for four (and not five) years.

In this example, a permanent efficiency saving of $20 is made in Year 0. Without an adjustment factor, the business would retain this saving for five years. The 'Year 0 adjustment' offsets the fifth year of benefit (received in year 4) with a corresponding negative adjustment to the allowance in the first year of the next regulatory period (ie, year 5). Note that we are inflating this adjustment term by the WACC[170] in order to ensure incentives are fully equalised in present value terms (because the WACC represents our view of the appropriate discount rate).

**Figure D.4 ECM adjustment to ensure savings are held for no longer than determination**

| | | Regulatory Period 1 | | | | Regulatory Period 2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ECM1 | | | ECM2 | | | | | |
| Year | - | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| | $ | $ | $ | $ | $ | $ | $ | $ | $ | |
| Base allowance | 100 | 100 | 100 | 100 | 100 | 80 | 80 | 80 | 80 | |
| Actual | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | |
| Under (over) | 20 | 20 | 20 | 20 | - | - | - | - | - | |
| Outperformance | 20 | 20 | 20 | 20 | - | - | - | - | - | |
| Performance gain | 20 | 20 | 20 | 20 | | | | | | |
| Incremental gain | 20 | - | - | - | | | | | | |
| ECM1 calc | | | | | | | | | | |
| - year 0 | 20 | 20 | 20 | 20 | 20 | | | | | |
| - year 1 | | - | - | - | - | - | | | | |
| - year 2 | | | - | - | - | - | - | | | |
| - year 3 | | | | - | - | - | - | | | |
| - year 0 adjustment | | | | | | -21 | | | | |
| ECM benefit | | | | | | -21 | - | - | - | |
| Total allowance | | 100 | 100 | 100 | 100 | 59 | 80 | 80 | 80 | |
| Total gain (loss) | 20 | 20 | 20 | 20 | 20 | -21 | - | - | - | |

**Source:** IPART analysis.

Retaining the saving for five years would be inconsistent with the purpose of the ECM of equalising incentives over time. The business may have an incentive to delay savings until the last year of a determination period in order to maximise returns.[171]

The adjustment term only applies to a permanent efficiency saving that is made in the final year of a regulatory period. Because the business receives this benefit for five years initially

170 If cash flows are assumed to occur at the end of each year, this should be the WACC used for regulatory period 2.

171 This incentive already exists under the current form of regulation.

(years 0, 1, 2, 3, and 4), the adjustment term inflates the fifth year of this benefit (received in year 4) by the WACC and returns it to customers in year 5.

# E Essential Water's proposed cost pass-through events

Table E.1 below summarises Essential Water's proposed cost pass-through events and triggers.

**Table E.1 Essential Water's proposed cost pass-through events**

| 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:<br>▼ a change in a regulation or requirement; or<br>▼ an administrative act or decision:<br>– substantially varying the manner Essential Water is required to provide a regulated service<br>– imposing, removing or varying minimum service standards applicable to regulated water or wastewater services<br>– the nature or scope of regulated water or wastewater services provided by Essential Water; or<br>▼ 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:<br>▼ undertaking capital investment; and/or<br>▼ undertaking maintenance activities<br>and the costs of this direction:<br>▼ causes Essential Water to incur costs beyond any drought relief allowances made by IPART in the determination; and<br>▼ 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:<br>▼ 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;<br>▼ 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;<br>▼ 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<br>▼ 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. | 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 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<br>▼ 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;<br>▼ 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.

# F How we calculated the capital, tax and working capital allowances

This Appendix outlines how we calculated the capital allowance, and the tax and working capital allowances.

To calculate the capital allowance, we need to determine three key inputs:

- The value of Essential Water's regulatory asset base (RAB), in each year of the determination. This represents the economic value of the assets used to deliver the regulated services.
- The asset lives and depreciation method for Essential Water's RAB.
- The appropriate rate of return (eg, the WACC) on Essential Water's RAB.

After making our draft decisions on Essential Water's prudent historical and efficient forecast capital expenditure, and the appropriate economic lives for Essential Water's assets, we applied our standard approach to establish the RAB and depreciation allowances. We then applied our WACC method to establish the rate of return.

We then applied our 2018 working capital policy to set the working capital allowance, and then established a benchmark tax allowance.

The sections below provide an overview of our calculations.

## F.1 Value of the regulatory asset base

The RAB represents the value of Essential Water's assets on which we consider it should earn a return on capital and an allowance for regulatory depreciation. In determining the value of the RAB over the 2019 determination period, we have calculated:

- The opening RAB at 1 July 2019, by rolling the RAB forward from 2013-14 to 2018-19, and
- The value of the RAB in each year of the 2019 determination period.

We have also identified separately the value of the consequential works.

### Calculating the opening RAB

In calculating the opening RAB, we rolled forward the RAB over the 2014 determination period. This involved using the determined RAB as at 1 July 2013[172] and making the following adjustments:

- adding prudent historical and efficient forecast capital expenditure (see Chapter 6)

[172] When we set the RAB at our 2014 Determination, the figures we used for 2013-14 were forecasts. Therefore, we need to adjust the 2013-14 figures for our actual figures including our decisions on capital expenditure for 2013-14.

- deducting cash capital contributions
- deducting the regulatory value of assets disposals
- deducting the regulatory depreciation we allowed at the 2014 Determination, and
- adding the annual indexation of the RAB.

This determines the opening RAB for the 2019 determination period. The calculation of the opening RAB is set out in Table F.1 below, and includes our draft decision on Essential Water's efficient consequential works for 2018-19. Our decisions regarding the treatment of cash contributions are discussed later in this appendix.

**Table F.1 IPART's opening RAB calculation for Essential Water's 2019 Determination ($millions, $nominal)**

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|---|---|---|
| **Opening RAB** | **89.4** | **94.6** | **100.3** | **105.7** | **110.4** | **114.3** |
| *Plus:* Actual prudent capex | 4.1 | 6.3 | 14.4 | 5.7 | 3.8 | 21.3 |
| *Less:* Cash capital contributions | 0.0 | 0.0 | 7.9 | 0.6 | 0.0 | 0.0 |
| *Less:* Asset disposals | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| *Less:* Allowed regulatory depreciation | 1.6 | 2.1 | 2.2 | 2.3 | 2.5 | 2.5 |
| *Plus:* Indexation | 2.7 | 1.5 | 1.0 | 2.1 | 2.6 | 3.1 |
| **Closing RAB** | **94.6** | **100.3** | **105.7** | **110.4** | **114.3** | **136.2** |

**Note:** Columns may not sum due to rounding.

Our calculation results in a closing RAB value at 30 June 2019 that is similar to Essential Water's proposed closing RAB (Table F.2).

**Table F.2 Comparison of IPART's and Essential Water's closing RAB at 30 June 2019 ($millions, $nominal)**

| | Essential Water | IPART | $ difference | % difference |
|---|---|---|---|---|
| Closing RAB value | **135.3** | **136.2** | **0.9** | **0.7%** |

**Source:** Essential Water's pricing proposal to IPART, September 2018; IPART analysis

### Calculating the RAB over the 2019 determination period

To calculate the RAB in each year of the 2019 determination period, we rolled forward the RAB to 2021-22 by:

- adding $53.7 million of efficient forecast capital expenditure over the period (see Chapter 6), and
- deducting $9.3 million for regulatory depreciation.

This gives the forecast RAB for each year of the 2019 determination period, which we have used to generate the allowances for the return on capital and regulatory depreciation in the notional revenue requirement.

The RAB roll-forward over the 2019 determination period is shown in Table F.3 below. With the exception of efficient forecast capital expenditure (see Chapter 6), we discuss our decisions on the various RAB adjustments in further detail in the sections below.

**Table F.3 IPART's RAB for Essential Water's 2019 Determination ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|
| **Opening RAB** | **136.2** | **160.0** | **169.0** |
| *Plus:* Forecast efficient capex | 26.6 | 12.2 | 14.2 |
| *Less:* Cash capital contributions | 0.0 | 0.0 | 0.0 |
| *Less:* Asset disposals | 0.0 | 0.0 | 0.0 |
| *Less:* Allowed regulatory depreciation | 2.8 | 3.1 | 3.3 |
| *Plus:* Indexation | 0.0 | 0.0 | 0.0 |
| **Closing RAB** | **160.0** | **169.0** | **179.9** |

**Note:** Columns may not sum due to rounding.

Our calculation of the RAB for the 2019 determination period results in the RAB being marginally lower than Essential Water's proposal. Our draft decision to include the consequential works for the Murray River to Broken Hill pipeline has been largely offset by our draft decisions to reduce its proposed direct capital expenditure (see Chapter 6).

**Table F.4 IPART's draft decision and Essential Water's proposed closing RAB for the 2019 Determination ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 |
|---|---|---|---|
| Essential Water proposed | 147.6 | 165.6 | 180.4 |
| IPART draft decision | 160.0 | 169.0 | 179.9 |
| Difference | 12.4 | 3.4 | -0.5 |

**Note:** Columns may not sum due to rounding.

**Source:** Essential Water pricing proposal to IPART, July 2018, p73; IPART analysis.

## F.2 Cash capital contributions

Cash capital contributions that a utility receives from third parties towards its capital expenditure, such as government grants, are netted off capital expenditure (ie, they do not enter the RAB). This ensures that customers do not pay a return on assets or regulatory depreciation for capital expenditure that the utility has not funded.

With the exception of Government funding for emergency drought works in 2015-16, historical cash contributions have been relatively small (Table F.5).

**Table F.5 IPART's draft decision and Essential Water's proposed historical cash contributions ($millions, $2018-19)**

| | 2013-15 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|---|---|---|
| Essential Water proposed | 0.02 | 0.004 | 11.30 | 0.93 | 0.00 | 0.03 |
| IPART draft decision | 0.02 | 0.004 | 11.30 | 0.93 | 0.00 | 0.03 |

**Note:** The table presents the total cash contributions for water and sewerage.

**Source:** Essential Water Annual Information Return, September 2018.

Essential Water has forecast cash capital contributions of zero in all years over the next determination period. However, the NSW Government has not confirmed funding decisions for consequential works, which could take the form of cash capital contributions – that is, total capital costs for consequential works could be offset by grants and capital contributions from the NSW Government. Therefore, given the uncertainty around the exact form of funding from the NSW Government, we have decided to accept Essential Water's proposal of forecast cash capital contributions of zero.

We have not included any cash contributions from the NSW Government for the Murray River to Broken Hill pipeline in Essential Water's RAB. This is because any cash contribution would be used to directly offset any operating costs that Essential Water would pay to WaterNSW for the provision of bulk water – the cash contribution provided by the NSW Government would not be for any capital expenditures for Essential Water.

## F.3 Adjustments for asset disposals

Disposals can include asset sales, write-offs and write-downs. The value of any regulatory assets Essential Water disposes of during the 2014 determination period and proposes to dispose of during the 2019 determination period are deducted from the RAB. This ensures customers are not charged a return on assets or regulatory depreciation for assets that are no longer used to provide regulated services.

Essential Water submitted that it had no asset disposals over the 2014 determination period. Further, it forecasts that it will have no asset disposals over its upcoming determination period. Based on its historical information, we have accepted its proposal as being reasonable. However, we will further examine this issue at its next price review (ie, 2023 Determination) and whether any write-offs or write-downs are appropriate for the 2019 determination period, in light of its capital program over the 2019-22 period.

## F.4 Regulatory depreciation

An allowance for regulatory depreciation is included in the revenue requirement (and used in calculating the value of the RAB, as discussed above). This is intended to ensure that the capital invested in the regulatory assets is returned over the useful life of each asset.

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

Essential Water used a straight-line depreciation method to calculate its proposed revenue requirement. This is the same approach we used in previous reviews and for this Draft Determination, we have decided to continue with it as we consider it is preferable to other methods in terms of simplicity, consistency and transparency.

Our allowance for the return of capital (regulatory depreciation) is slightly lower than Essential Water's proposed allowance (Table F.6). This is mainly due to our draft decisions on corporate costs related to capital expenditure (see Chapter 4 and Chapter 6). That is, our draft decisions to:

- Not re-allocate capitalised corporate overheads over the 2014 determination period to the newly created corporate RAB, and
- Not depreciate all corporate overheads over Essential Water's proposal of 25 years.

We have made a draft decision that corporate overheads capitalised to water and sewerage capital expenditure would remain assigned to those water and sewerage capital expenditures and be depreciated over the relevant water and sewerage economic lives - which is a longer timeframe compared with Essential Water's proposed 25 years.[173] As such, our draft decisions result in slightly lower depreciation allowances compared to Essential Water's proposal.

**Table F.6 IPART's draft decision and Essential Water's proposed return of assets ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total |
|---|---|---|---|---|
| Essential Water proposed | 3.0 | 3.3 | 3.7 | 10.0 |
| IPART draft decision | 2.8 | 3.1 | 3.3 | 9.1 |
| Difference | -0.3 | -0.3 | -0.4 | -1.0 |

**Note:** Columns may not sum due to rounding.

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

## F.5 Return on capital

We include an allowance for a return on assets in the revenue requirement. This represents our assessment of the opportunity cost of the capital invested to provide the regulated services. Our approach ensures that the business 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. As for previous reviews, we have determined the rate of return using an estimate of the Weighted Average Cost of Capital (WACC).

We applied our 2018 WACC method, which was developed in consultation with stakeholders.[174] This results in a WACC of 4.2%.

173 Over the relevant economic life of water or sewerage assets which is 89 years or more.

174 We completed a review of our WACC methodology in 2018 (IPART, *Review of our WACC method – Final Report*, February 2018).

The WACC is based on market data (risk free rate, debt margin and inflation) sampled to 31 January 2019. The market-based parameters and the resulting WACC will be updated before we make our final decision. Our draft decisions on parameters are shown in Table F.7.

Table F.7 shows that we have adopted an equity beta of 0.7, which is our current water industry beta. In Appendix G, we discuss a revised approach we are developing to estimate the equity beta, which reflects the improvements that we decided to make in our 2018 WACC review.

**Table F.7 IPART's draft WACC (sampled to 31 January 2019)**

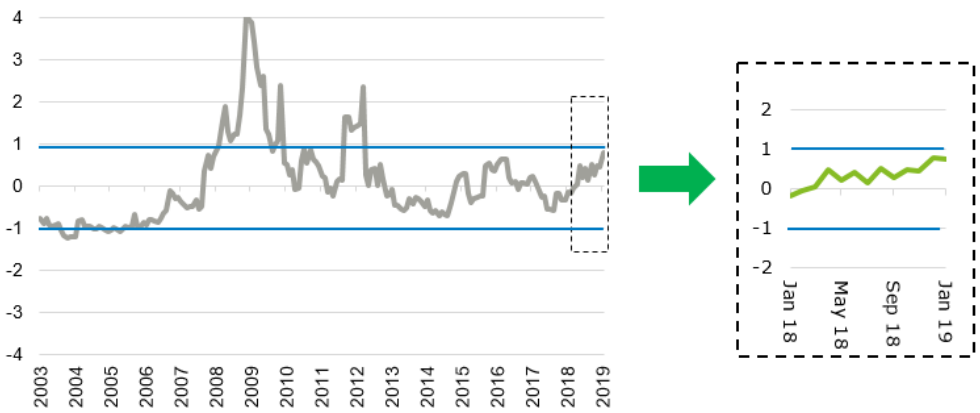
| | Current market data | Long term averages | WACC range | | |
|---|---|---|---|---|---|
| | | | Low | Mid | High |
| Nominal risk free rate | 2.4% | 3.6% | | | |
| Inflation | 2.3% | 2.3% | | | |
| Implied Debt margin | 2.5% | 2.7% | | | |
| | | | | | |
| Market risk premium | 8.6% | 6.0% | | | |
| Debt funding | 60% | 60% | | | |
| Equity funding | 40% | 40% | | | |
| Gamma | 0.25 | 0.25 | | | |
| Corporate tax rate | 30% | 30% | | | |
| Equity beta | 0.70 | 0.70 | | | |
| Cost of equity (nominal post-tax) | 8.4% | 7.8% | | | |
| Cost of equity (real-post tax) | 5.9% | 5.4% | | | |
| Cost of debt (nominal pre-tax) | 4.8% | 6.3% | | | |
| Cost of debt (real pre-tax) | 2.5% | 3.9% | | | |
| Nominal Vanilla post-tax WACC | 6.2% | 6.9% | 6.2% | 6.6% | 6.9% |
| Pre-tax real WACC | 4.8% | 5.4% | 4.8% | 5.1% | 5.4% |
| **Post-tax real WACC** | 3.9% | 4.5% | 3.9% | **4.2%** | 4.5% |

**Source:** Bloomberg, RBA and IPART calculations.

As our measure of market uncertainty is currently within one standard deviation of the long term average (Figure F.1), we have selected the midpoint WACC value. This is consistent with our decision rule for selecting a point within our range of WACC values.[175]

175 IPART, *Review of our WACC method – Final Report,* February 2018, p 67.

**Figure F.1 IPART financial market uncertainty index**




**Source:** Thomson Reuters, Bloomberg and IPART calculations.

Essential Water proposed a declining WACC of 4.5% to 4.1%.[176]

## F.6 Return on assets

We multiply the RAB by the WACC to establish the return on assets. Our draft decisions have resulted in an overall slightly higher return on assets compared with Essential Water's proposal (Table F.8), despite our WACC being lower than Essential Water's proposed WACC. This is because the lower WACC has been offset by our higher RAB compared to Essential Water's proposal.

**Table F.8 IPART's draft decision and Essential Water's proposed return on assets ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total |
|---|---|---|---|---|
| Essential Water proposed | 6.3 | 6.5 | 7.0 | 19.8 |
| IPART draft decision | 6.2 | 6.8 | 7.3 | 20.2 |
| Difference | -0.1 | 0.3 | 0.2 | 0.4 |

**Note:** Columns may not sum due to rounding.

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

## F.7 Allowance for tax and working capital

As discussed in Chapter 4, we include an explicit allowance for tax, because we use a post-tax WACC to estimate the allowance for a return on assets in the revenue requirement. This allowance reflects the regulated business's forecast tax liabilities. Our building block also includes a working capital allowance.

176 Essential Water pricing proposal to IPART, July 2018, p 165.

## The tax allowance

We calculate the tax allowance for each year by applying the relevant tax rate, adjusted for the value of imputation credits (the 'gamma'), to the business's (nominal) taxable income. For this purpose, taxable income is the notional revenue requirement (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses. As part of calculating the appropriate tax allowance, the business is required to provide forecast tax depreciation for the determination period. Other items such as interest expenses are based on the parameters used for the WACC, and the value of the RAB.[177]

The tax allowance is one of the last building block items we calculate, due to its dependence on other items such as operating cost allowances and WACC parameters.

To establish the tax allowance, we:

- Adopted a 30% tax rate, because the NRR for Essential Water is above the small business tax threshold of $50 million per annum.
- Accepted Essential Water's tax depreciation forecasts (we will update this value prior to our final determination).
- Accepted Essential Water's forecast non-cash contributions.

Our draft tax allowance is shown in Table F.9.

### Adopting a corporate statutory tax rate of 30%

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 $50 million (base rate entities) pay 27.5% tax, while those with a higher turnover pay 30% tax on all their taxable income. 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.[178]

For our draft decision we used a tax rate of 30%. This is because our calculations show that total revenue (in nominal terms) inclusive of NSW Government contributions, is forecast to be higher than the $50 million threshold in all years (see Chapter 4). Thus, the reduced corporate income tax rates for small businesses are not applicable.[179]

### Accepting Essential Water's forecast of zero non-cash capital contributions

Non-cash capital contributions (also known as Assets Free of Charge, or 'AFOC') are assets that utilities receive for free. Non-cash capital contributions do not affect the RAB, and utilities do not earn a return on or of those assets. Utilities, however, are required to pay tax equivalents on the value of non-cash capital contributions. As such, we need to include forecast AFOC as revenue in the calculation of the regulatory tax allowance building block.

177 The nominal cost of debt is the sum of the nominal risk free rate and nominal debt margin.
178 The thresholds are not indexed for inflation.
179 We also conducted sensitivity testing using small business tax rates, which still resulted in revenue (in nominal terms) from tariffs being higher than the $50 million threshold over the 2019 determination period.

Essential Water has had zero non-cash capital contributions in all historical years, and have also forecast zero contributions. For the other metropolitan water utilities we regulate, AFOC are typically gifted to the utilities from developers as a result of new development.[180] Given Essential Water's operating environment in Broken Hill we consider it unlikely that new development would occur in the short-term, and so we have accepted Essential Water's proposal.

**Table F.9 IPART's draft decision and Essential Water's proposed tax allowance ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total |
|---|---|---|---|---|
| Essential Water proposed | 0.2 | 0.2 | 0.6 | 1.1 |
| IPART draft decision | 0.2 | 0.2 | 0.7 | 1.1 |
| Difference | -0.1 | 0.0 | 0.1 | 0.0 |

**Note:** Columns may not sum due to rounding.

**Source:** Essential Water's pricing proposal to IPART, September 2018; IPART analysis.

### The working capital allowance

IPART finalised its updated working capital policy in September 2018. Consequently, we have implemented the final policy in this draft decision, using updated data provided by Essential Water during our review of its September 2018 pricing proposal. Table F.10 shows our draft decision on working capital allowance for the 2019 Determination period.

**Table F.10 IPART's draft decision and Essential Water's proposed working capital allowance ($millions, $2018-19)**

| | 2019-20 | 2020-21 | 2021-22 | Total |
|---|---|---|---|---|
| Essential Water proposed | 0.02 | 0.00 | 0.02 | 0.04 |
| IPART draft decision | 0.20 | 0.28 | 0.28 | 0.76 |
| Difference | 0.17 | 0.28 | 0.26 | 0.72 |

**Note:** Columns may not sum due to rounding.

**Source:** Essential Water's pricing proposal to IPART, September 2018; IPART analysis.

Our higher allowance for working capital is largely due to the following factors:

- Our updated working capital method[181] has increased the working capital allowance.
- Our draft decisions on the levels of operating and capital expenditure. The inclusion of bulk water transportation costs and consequential works capital expenditure have resulted in an increase in the working capital allowance.

180 For example, developers are typically required to install reticulation to service new development and then gift these assets to the water utilities at no charge.

181 IPART, Working Capital Allowance Policy Paper, November 2018.

# G Our proposed process for estimating the equity beta

In this Appendix we outline a new process for estimating the equity beta that we are developing. This new process implements the decisions we made in our 2018 WACC review to improve the way we estimate the equity beta.[182] We have also released a fact sheet on our website seeking feedback on the new process.[183]

To illustrate how this method would work, we have estimated a water industry beta using our new method. However, we have not applied this estimate in this review, as we are still developing this process and we have not yet consulted with stakeholders on the new method. Instead, we have applied our existing water industry beta in this review. We note that the water industry beta using our new method (0.74), is similar to our existing water industry beta (0.7).

We would have regard to the equity beta estimated with this method along with other evidence on beta in our future WACC decisions.

## G.1 Summary of the process

We have developed a framework for selecting proxy companies in a given industry and estimating the equity beta for these firms. The purpose of this framework is to generate a beta estimate that applies objective and defensible decision rules to market data. These procedures are described below and are divided into three main sections:

- Pre-estimation screening rules
- Data quality and liquidity filters, and
- Post-estimation screening rules.

The basic process is outlined below in Figure G.1 which shows the decision rules and sample selection process.

182 IPART, Review of our WACC method, Final Report – Research, February 2018.
183 IPART, Estimating Equity Beta, Fact Sheet, March 2019.

**Figure G.1 Sample company selection process**

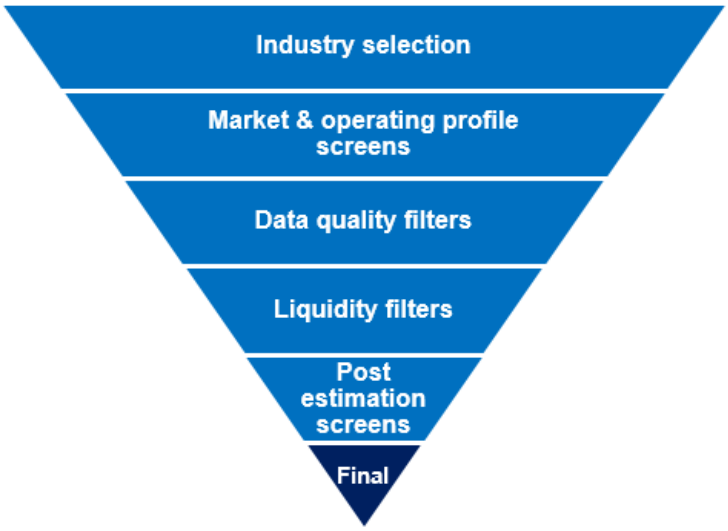



**Table G.1 Sample selection rule summary**

| Criteria |
|---|
| **Pre-estimation screening rules** |
| **Industry** |
| What industry, or industries, should be used to identify proxy firms? |
| **Firm Characteristics** |
| Does the firm operate in the nominated industry, or industries? |
| Does the firm undertake their activities in capital markets that are sufficiently similar to Australia? |
| Does the firm have a similar operating profile to the benchmark efficient firm? |
| **Market** |
| Is the sovereign's government bond market sufficiently deep and liquid? |
| Is the sovereign's equity market sufficiently deep and liquid? |
| Is the firm's international headquarters consistent with their actual operating market? |
| **Operating Profile** |
| Is firm revenue predominately in the nominated industry? |
| **Liquidity filters & data quality** |
| Remove a monthly observation for a given stock if there is less than 10 days of trading data available. |
| Remove a monthly observation for a given stock if the calculated Amihud measure exceeds the threshold of 25. |
| Remove firm if it has less than 36 months of trading data available. |
| **Post-estimation screening rules** |
| Is the sample size sufficiently large? |
| Are the estimates consistent (no extreme outliers)? |
| Are there obvious biases in the results? |

## G.2 Pre-estimation screening rules (firm characteristics)

We have proposed three characteristic screens for the selection of proxy companies, where sample firms must:

1. Operate in a nominated industry (review-specific and possibly including industries nominated by stakeholders).
2. Undertake their activities in capital markets that are sufficiently similar to Australia.
3. Exhibit a similar operating profile to the benchmark efficient firm.

### G.2.1 Industry

The industry of the benchmark efficient firm is a broad proxy for the risk profile of that firm, ie, that all firms within a common industry group face the same or similar business risks.

The Thompson Reuters Business Classification (TRBC) is one of many industry classification schemes. It divides publicly traded equities into 54 industries and 136 sub-industries. Table G.2 below shows the number of active water-related firms in each of the TRBC classification levels.

**Table G.2 Active firms under different levels of TRBC classification**

| Classification level | Name | Number of active firms |
|---|---|---|
| Industry | Gas, Water & Multiutilities | 624 |
| Sub-industry | Water | 228 |

**Source:** Thompson Reuters Datastream

To estimate a water industry beta, we have used firms in the "Water" sub-industry definition. This could potentially exclude companies which operate under similar conditions. By considering other related industries – for example electricity network operators when estimating WACC for water utilities – we may broaden the scope of potential comparators (with some additional risk of bias).

### G.2.2 Market

Given the benchmark efficient firm is Australian, we seek to include markets that approximate Australia's sovereign characteristics. Therefore, we consider there are three main questions which determine the comparability of international firms:

1. Is the sovereign's government bond market sufficiently deep and liquid?
2. Is the sovereign's equity market sufficiently deep and liquid?
3. Is the firm's international headquarters consistent with their actual operating market?

The current sample excludes companies that trade on the Chinese, Russian and a selection of African stock exchanges on the basis they exhibit sufficiently different sovereign characteristics and may bias the result.

This decision rule reduces the sample size from 228 to 198 companies.

### G.2.3 Operating profile

In terms of business structure, we consider whether the firm's revenue is predominately in the nominated industry.

For this preliminary analysis, the 'water' sub-industry is our nominated industry, and have therefore assumed the majority of the firms' revenue comes from activities related to water supply and treatment.

No adjustments have been made to the sample on the basis of differences in operating profile.

### G.2.4 Data quality

Further screens are made to the sample if insufficient data is returned from Datastream. We exclude firms that:

- Do not return an International Securities Identification Number (ISIN), because relevant data for the firm cannot actually be extracted.
- Do not return a market index code, as we would not be able to identify the market in which the firm operates.
- Are no longer trading. This is discussed further below.
- Return a connection error.

This reduces the sample size from 198 to 128 firms.

## G.3 Beta estimation liquidity filters

In the 2018 WACC review we decided to exclude thinly-traded stocks when estimating equity betas. These stocks could produce distorted estimates due to stale price data. We applied three liquidity filters in the beta estimation process, as outlined below.

### G.3.1 Remove months with less than 10 days of trading data for a given stock

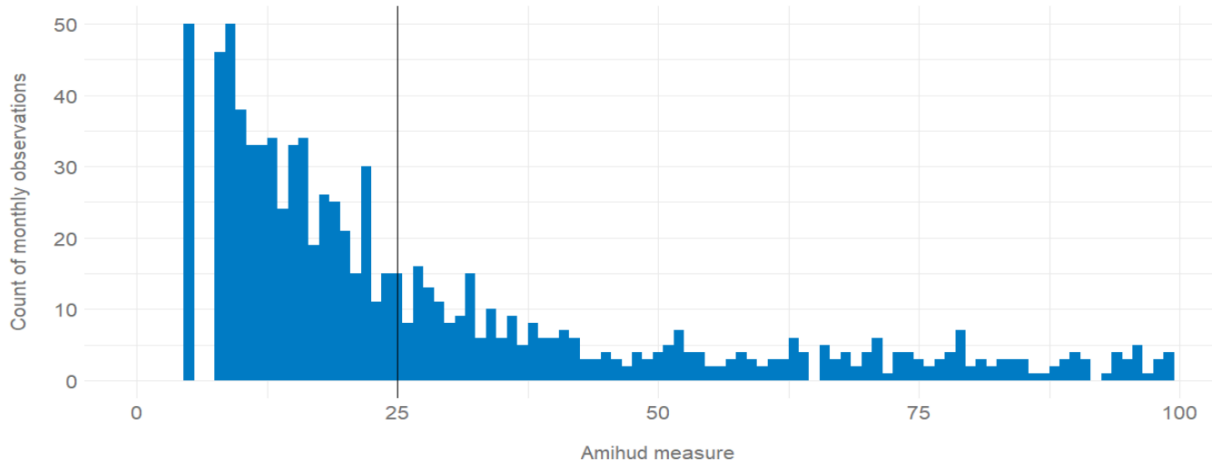
We first removed a monthly observation for a given stock if there was less than 10 days of trading data available. A large portion of the monthly observations fail to meet the first liquidity hurdle. Only around 70% of the monthly observations for all companies have more than 10 days of trading data.

Applying this decision rule reduces the sample size from 128 to 83 firms.

### G.3.2 Exclude firm-months which exceed Amihud threshold

The Amihud measure approximates the price impact of illiquidity.[184] Using the Amihud measure as a screening tool, we removed a monthly observation for a given stock if the calculated Amihud measure exceeds the threshold of 25. The threshold value we selected for the Amihud measure was benchmarked against historical equity returns data for the Australian stock market. Figure G.1 below shows the number of monthly observations excluded after the Amihud filter is applied.

**Figure G.1 Distribution of monthly observations by Amihud measure**




**Source:** Datastream, IPART

Applying this decision rule reduces the sample size from 83 to 72.

### G.3.3 Exclude firms with less than 36 months of available data

After applying the above filters, if a given firm has less than 36 months of trading data available, we exclude this company from the sample. In our view a time series of less than three years is too short to calculate a reliable medium-run beta estimate. In many instances, a short time series will represent a newly established firm, which is likely inconsistent with our consideration of a mature benchmark efficient firm. Furthermore, short time series are more prone to measurement error, reducing the reliability of results.

This decision rule reduces the sample from 72 to a final proxy list of 45 firms.

## G.4 Post-estimation screening rules

The post-estimation screens focus on the equity beta outputs for the sample of individual firms, to ensure estimates are robust and appear unbiased. We recommend accepting the proxy sample as final where:

1. The sample size is sufficiently large.
2. Estimates appear to be consistent, with clear outliers excluded from the sample.

184 IPART, Review of our WACC method, Final Report – Research, February 2018, p 62.

3. There is no obvious bias in the results. This includes assessing the results against other estimates of beta (eg, from Datastream, Bloomberg, historical estimates by IPART and other comparable regulators, or academic estimates).

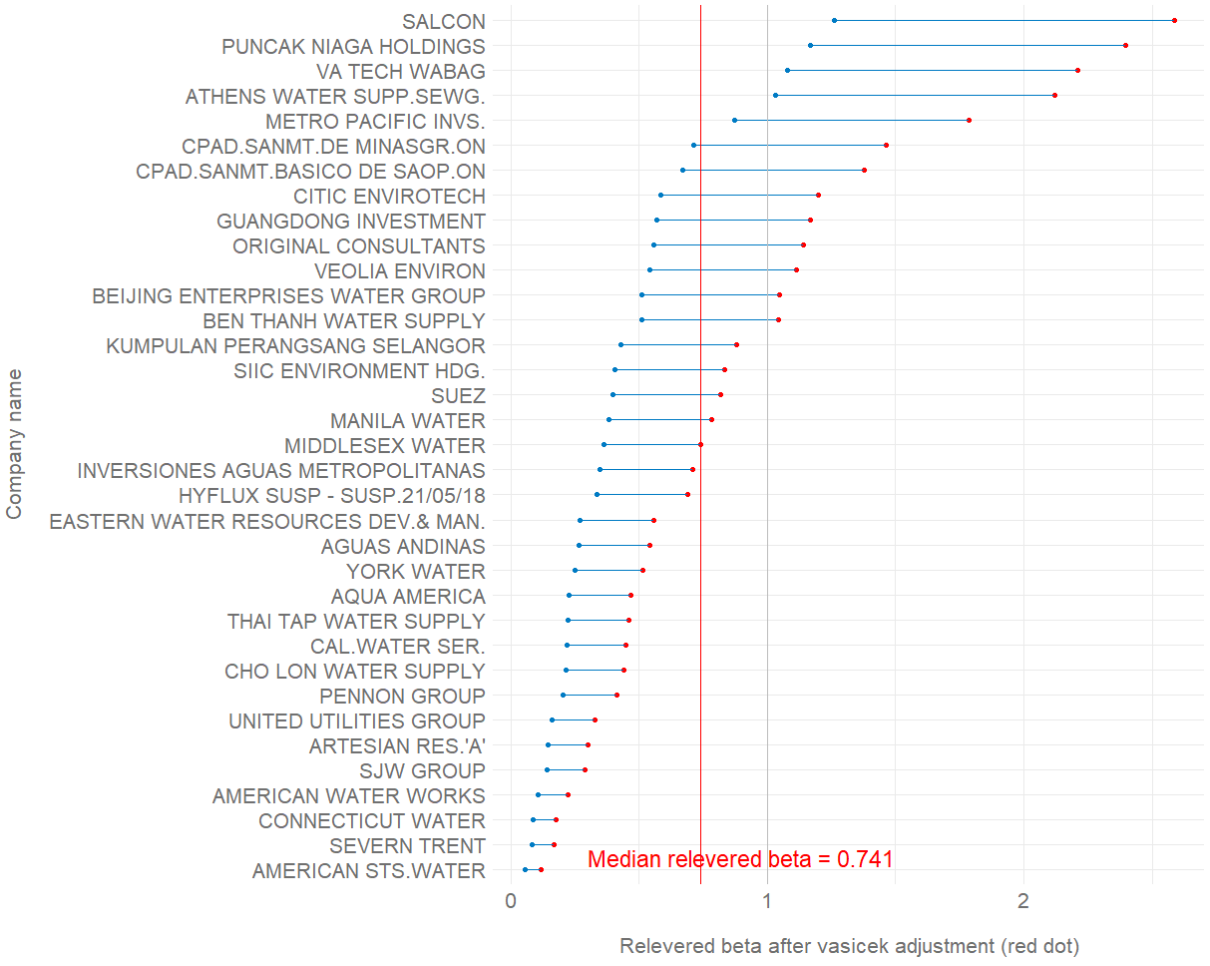
No changes have been made to the current estimate based on these screening rules.

## G.5 Current estimate

Figure G.2 below shows a median equity beta estimate of about 0.7 for the final sample of proxy firms. The blue dots show the unlevered asset beta estimate after we have applied the Vasicek adjustment.[185] The red dots are the final relevered equity beta estimate using a 60% gearing rate.

Datastream did not return gearing information for some companies and these firms have been removed from the final sample, reducing it to 35. In the future, capital structure data can be accessed via other sources so these firms can be retained in the sample.

**Figure G.2 Relevered beta estimate from sample of 35 water-utilities at 60% gearing**




**Source:** Datastream, IPART

185 IPART, Review of our WACC method, Final Report – Research, February 2018, p 64.

## G.6 Areas for development

We have automated the process for estimating the equity beta using an R script, which obtains financial market data directly through a Datastream API.[186] The advantage of this approach is that it increases the replicability of our process. The exact same process would be followed in reviews across time, with only the specific proxy companies that are included and the timeframe for the analysis changing.

However, in the short-term, we have identified a few shortcomings that we still need to resolve, to improve the robustness of the equity beta estimate.

### G.6.1 Incorporate 'dead' firms using supplementary data sources

Limitations of the Datastream API mean our sample is limited to active firms only. This creates survivorship bias, because companies that have stopped trading still have valid historical return data which can be used in the estimation process. Going forward, we intend to incorporate Bloomberg data (in addition to Datastream API data) to include information for firms that have stopped trading.

### G.6.2 Use different industry classification schemes to increase sample size of proxy firms

Firms identified through alternative industry classification schemes, such as Global Industry Classification Standard (GICS) and Bloomberg Industry Classification Systems (BICS) may be useful in increasing the sample size.

### G.6.3 Develop more formal post-screening tests

Going forward, we will consider developing formal robustness checks, eg, tests for statistical significance, autocorrelation and heteroskedasticity. In the fact sheet we have released, we seek feedback from stakeholders on the appropriate robustness checks we could include, provided they are meaningful, simple to interpret and calculate.

186 R is a programming language and free software environment for statistical computing and graphics supported by the R Foundation for Statistical Computing.

# H Marginal cost of water supply

In this review, we set the water and sewerage usage price with reference to estimates of marginal cost. The marginal cost of water (or sewerage) represents the additional cost to Essential Water of providing an additional unit of water to customers (or treating an additional unit of sewerage for customers).

Adopting a two-part tariff structure, where usage charges are set to reflect the marginal cost of supply, with fixed charges then set to recover the remaining efficient costs that are not received from usage charges, is generally accepted as an efficient approach to setting water prices.

## H.1 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 relaxes this capacity constraint because in the long run all factors of production are variable, including capital costs. Hence, LRMC also reflects the opportunity cost of consuming water, to the extent that it brings forward the need to increase capacity.

Essential Water has proposed to use LRMC as the basis for setting water usage prices. It submitted that 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 with reference to 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 the other metropolitan water utilities that we regulate, our practice has been to set usage prices with reference to LRMC. These utilities service growing populations and would face the prospect of capacity constraints, and therefore the need for supply augmentation in the foreseeable future.

However, we consider that it is unlikely that supply augmentation would be needed in Broken Hill in the foreseeable future. This is because Broken Hill's population and water consumption is declining (see Chapter 7 for more details). Furthermore, the new Murray River to Broken Hill pipeline will provide up to 37.4 ML of bulk water per day, which is roughly 140% of Broken Hill's peak water demand.[187]

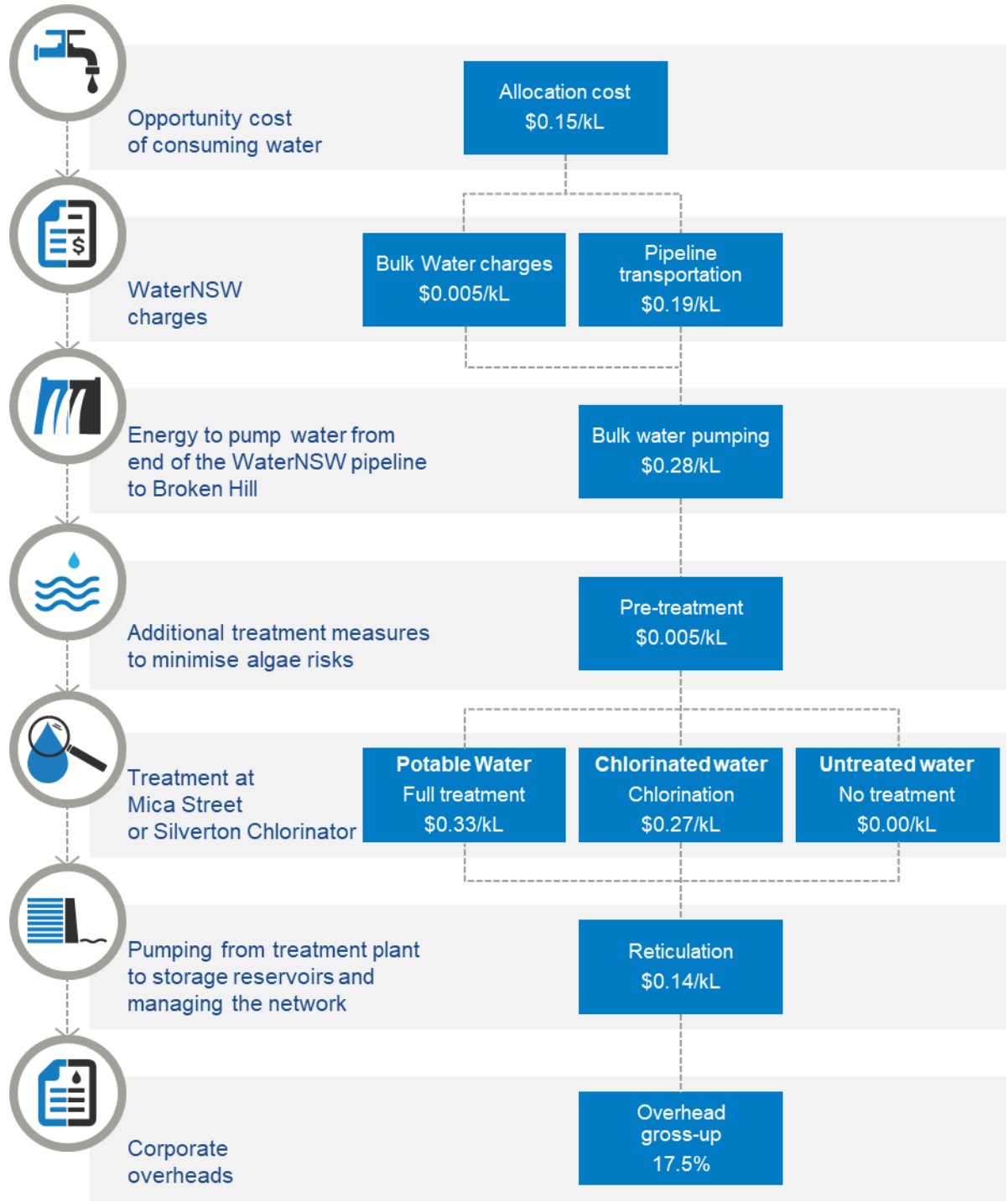
187 Essential Water annual information return to IPART, July 2018.

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

## H.2 Essential Water's short-run marginal cost of water supply

We have estimated Essential Water's SRMC of supplying water by adding all the different costs incurred by Essential Water to supply one unit of water from 'catchment-to-tap' (Figure H.1).

**Figure H.1 Marginal cost of supplying water along the water supply network**



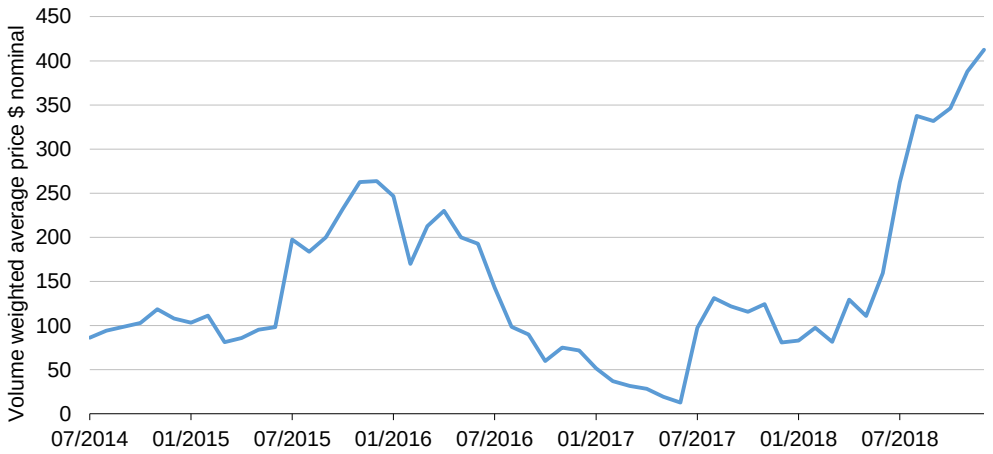

Below we outline how we have estimated each cost component:

The opportunity cost of consuming water (bulk water scarcity)

This is the opportunity cost of consuming water from the Murray River. We estimated a price of $0.15 per kL based on the value of allocation trades in the NSW Murray River, using data

from the Bureau of Meteorology. We used a simple average of monthly volume weighted trading prices since 1 July 2014 (as this was the date the current Basin Plan water trading rules came into place), using only trades with non-zero prices (see Figure H.2).

**Figure H.2 NSW Murray River allocation prices ($/ML)**




**Source:** Bureau of Meteorology

### WaterNSW's bulk water charges

As a licenced holder of water entitlements, Essential Water is required to contribute to river management costs. WaterNSW receives these charges on behalf of a number of organisations. These costs are separate from WaterNSW's pipeline transportation costs. Bulk water costs are directly observable, as they are the variable component of the Murray River entitlement charges we set in our 2017 determination.

This cost is small, and adds less than $0.01 per kL to the SRMC estimate.

### WaterNSW's bulk water pumping costs

This is WaterNSW's cost of pumping water to the bulk water storage facility. This is directly observable, as it is the variable component of the WaterNSW Murray River to Broken Hill pipeline price set by IPART in the concurrent WaterNSW pipeline review.

We estimate that the efficient marginal cost of pumping water through the WaterNSW pipeline is $0.19 per kL.

### Essential Water's bulk water pumping costs

Essential Water incurs costs pumping water from the bulk water storage facility to its Mica Street treatment plant. We calculated the cost of pumping an additional kL of water using:

- The electricity prices from the Frontier Economics electricity price report for the pipeline review, and

- The volume of energy required to pump this additional kL of water based on standard mathematical relationships.[188]

We estimate that this adds $0.28 per kL to the marginal cost.

### Water treatment costs

These costs include pre-treatment costs, treatment costs, and post-treatment costs.

Pre-treatment costs will be incurred by Essential Water to address the risk of algal blooms, which we estimated using data provided by Essential Water. These costs add less than $0.01/kL to our estimate.

Treatment costs include:

- Electricity costs at the Mica Street treatment plant - we used data provided by Essential Water and the Frontier Economics electricity prices to estimate these costs.
- Chemicals costs - chemical costs for treated and chlorinated water were provided by Essential Water.
- Chlorination - customers in Silverton receive chlorinated water. For these customers we estimated chlorination costs using data provided by Essential Water.

Treatment costs add between $0.27 per kL to $0.33 per kL depending on whether treated or chlorinated water is supplied.

Post-treatment costs include reticulation and storage costs, of $0.14 per kL. Costs are incurred at the margin in pumping water throughout the water network. We have used information provided by Essential Water and Frontier Economics electricity prices to estimate these costs.

### Corporate overheads

We included a provision for corporate overhead costs on all marginal cost components of 17.0%. This is because a corporate overhead is applied to every dollar of operating and capital expenditure (see Chapter 4 for our draft decision on corporate costs).

### We excluded some cost components from our estimate

We excluded the following two cost components from our SRMC estimate:

- **Labour.** This is because we assumed all labour costs in the system do not vary with usage. For example, we have assumed that the labour costs involved in routine inspections and maintenance are not driven by usage, at the margin.
- **Maintenance costs.** We have not included maintenance renewals in our SRMC estimate because we did not have sufficient information to determine how much of Essential Water's capital expenditure spend should be attributed to marginal usage. If we assume 100% of maintenance renewals is marginal, this would add around $0.62 per kL to the SRMC for treated water (ie, an SRMC estimate of $1.91 per kL).

[188] For further information, see AECOM, *The Mathematics of Pumping Water*, available at: https://www.raeng.org.uk/publications/other/17-pumping-water

Table H.1 summarises our SRMC estimate for water, including key components.

**Table H.1 SRMC estimates for water ($ per kL, $2018-19)**

| Cost component | $2018-19 |
|---|---|
| Opportunity cost of consuming bulk water | 0.15 |
| WaterNSW bulk water extraction costs | 0.005 |
| WaterNSW bulk water transportation costs | 0.19 |
| Bulk water transportation costs incurred by EW | 0.28 |
| Pre-treatment measures | 0.005 |
| Treatment costs – potable water | 0.33 |
| Treatment costs – chlorinated water | 0.27 |
| Treatment costs – untreated water | 0.00 |
| Reticulation and storage | 0.14 |
| Corporate overheads[a] | 0.13-0.19 |
| **Total SRMC estimate** | |
| Treated water | **1.29** |
| Chlorinated water | **1.20** |
| Untreated water | **0.90** |

**a** The corporate overheads vary for treated, chlorinated and untreated water, because the corporate overhead is included as a gross-up on direct costs.

**Source:** Correspondence with Essential Water, June 2018; and IPART analysis.

We note that the accuracy of our SRMC estimate is affected by the following factors:

- We are unable to quantify how much of Essential Water's asset renewals are attributable to marginal usage. Including renewals capital expenditure, the marginal cost for treated water could be as high as $1.91 per kL. However, we chose to exclude these costs given this uncertainty.
- Essential Water's customer demand is highly variable based upon rainfall and the introduction of the Murray River pipeline creates additional uncertainty. We have assumed that the marginal unit of water would be consumed from the Murray River to Broken Hill pipeline. We consider this to be a sound approach, because the past 20 years of data showed that in about 9 out of 10 years, some water was pumped from the Menindee pipeline.
- The opportunity cost of consuming from the Murray River is closely correlated to rainfall, and is therefore quite volatile over time. We have taken a simple average of monthly prices over the period July 2014 to December 2018.
- We have accounted for the fact that the marginal cost of pumping water scales non-linearly with increasing demand.

## H.3 Essential Water's short-run marginal cost of sewerage treatment

Essential Water did not provide an estimate of the marginal cost of sewerage treatment. 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 (4.2% per year in real terms).

We have estimated the SRMC for supplying sewerage by:

1. Determining the total sewerage volume forecast to be treated at all treatment plants.
2. Averaging the historical costs associated with the treatment of sewerage. These are the costs of: electricity, storage and reticulation, pumping costs, and corporate overheads.
3. Calculating SRMC as total variable costs divided by the total volume of sewerage treated.

We have estimated the SRMC for supplying sewerage at $0.22 per kL, using a 5-year average of Essential Water's sewerage operating costs (Table H.2). We did not consider that a more rigorous estimation was warranted given most cost components involved in sewerage such as pumping, treatment and discharge are predominately marginal. The costs we considered were:

- **Electricity** - this includes the costs of pumping stations and treatment plants.
- **Hire services** - this includes equipment and contractors.
- **Materials** - this includes chemicals and mechanical/electrical consumables.
- **Corporate overheads** - we have assumed a corporate overhead gross up of 17.0% on operating costs (same as for our SRMC estimate for water supply).

We have excluded the following costs from our SRMC estimate:

- **Labour** - we assumed that all labour costs in the system are not marginal, and are excluded from the calculation. This is consistent with our approach for the water SRMC estimate.
- **Fleet** - we also excluded fleet costs in our estimate because we did not have disaggregated information to separate marginal costs from fixed costs. It is likely that some portion of fleet costs are marginal, eg, fuel costs.
- **Maintenance costs** - we have excluded maintenance renewals in our SRMC estimate because we did not have sufficient information to determine how much of Essential Water's capital expenditure spend should be attributed to marginal usage. If we assume 100% of maintenance renewals is marginal, then up to $0.73/kL could be added to the SRMC for sewerage.

**Table H.2 SRMC estimate for supplying sewerage services ($/kL, $2018-19)**

| Cost component | $2018-19 |
|---|---|
| Electricity | 0.06 |
| Hire services | 0.07 |
| Materials | 0.05 |
| Corporate overheads | 0.03 |
| **Total SRMC estimate** | **0.22** |

**Source:** Essential Water Annual Information Return, September 2018; additional information provided by Essential Water, October 2018; IPART analysis.

We note that our analysis is limited by the following factors:

- Essential Water's sewerage volumes are not metered and we have estimated these volumes from assumed discharge factors,[189] which may not reflect actual usage patterns.
- We do not have sufficient information on what the major cost drivers are within each cost component, such as the relative contribution of chemical costs to material costs.

For each cost component we have assumed that the average unit cost equals the marginal cost, because we did not have sufficient information on actual marginal costs.

189 We have assumed a discharge factor of 70% for residential customers and 82% for non-residential customers, which are averages used by Essential Water.

# I Output measures

This appendix presents Essential Water's proposed output measures for the 2019 determination period.

In its pricing submission, Essential Water proposed maintaining its existing customer service level targets. These targets are presented in Table I.1 and Table I.2 below.

**Table I.1 Water output measures**

| Target | Criteria |
|---|---|
| Availability of Water Supply | Minimum pressure 15m head of water in reticulation system, conveying 6 litres per minute per residential connection under normal conditions |
| | Water restrictions should not be applied more than 5% of the time |
| | 3,000L/tenement/per day for residential potable water (4 month peak season) |
| | Planned works: residential customers 2 days written notice, non-residential 7 days written notice |
| | Water will be available from reticulation fire hydrants for fire-fighting at minimum flow rates determined by guidelines |
| Water quality | Potable water supply should meet Australian Drinking Water Guidelines |
| | Non-potable water supply should meet public health standards with respect to bacteria, contaminants and pathogens, consistent with its use |
| | Recycled water supply should meet Australian Guidelines for Water Recycling; Managing Health and Environmental Risks 2006 |
| Response times | Priority 1 - defined as failure to maintain continuity or quality of supply to a large number of customers or to a critical use at a critical time. Response time: 30 minutes (business hours); 1 hour (after hours) |
| | Priority 2 - defined as failure to maintain continuity or quality of supply to a small number of customers or to a critical user at a non-critical time. Response time: 1 hour (business hours); 2 hours (after hours) |
| | Priority 3 - defined as failure to maintain continuity or quality of supply to a single customer. Response time: 1 working day |
| | Priority 4 - defined as a minor problem or complaint which can be dealt with at a time convenient to the customer and the water authority. Response time: Within 2 weeks |
| Customer complaints | Customer complaints other than supply failure:<br>- Respond to 95% of written complaints or inquiries within 4 working days of receipt.<br>- Respond to 95% of personal complaints or inquiries within 4 working days. |

**Source:** Essential Water, Strategic Plan (confidential), May 2018.

**Table I.2 Sewerage output measures**

| Target | Criteria |
|---|---|
| Availability of Sewerage Service | Connections for domestic sewage should be provided to all houses, units or businesses within the defined service area of Broken Hill. There are no plans at present for sewerage services to other locations. |
| | Acceptance of commercial and industrial waste (trade waste) should be in accordance with the approval conditions for each discharger. |
| Average system failures | Controlled, expected (overflow structure) - related to rainfall and design:<br>Not more than 2 times in 1 year on average. |
| | Controlled, unexpected (flow relief structure):<br>Not more than once in 5 years. |
| | Uncontrolled, unexpected:<br>Private Property: not more than 50 per 1000 properties per year.<br>Public Property - sensitive areas: not more than once per 3 years.<br>Public Property - elsewhere: not more than once per 10 km of main per year. |
| Response times | Priority 1 - defined as 'major failure to contain sewage within the sewer system or any problem affecting a critical user at a critical time'. Response time: 30 minutes (working hours); 1 hours (after hours) |
| | Priority 2 - defined as 'minor failure to contain sewage within the sewer system or any problem affecting a critical user at a non-critical time'. Response time:<br>1 hour (working hours); 2 hours (after hours) |
| | Priority 3 - defined as 'minor failure to contain sewage affecting a single property or as bad odours'. Response time: next working day |
| Customer complaints | Respond to 95% of written complaints or inquiries within 4 working days of receipt.<br>Respond to 95% of personal complaints or inquiries within 4 working days |
| Odours/Vectors | Not more than 2 incidents per year that results in complaints. |
| Impact of Sewerage Treatment Plants | The maximum level of noise should not be more than 5 dB above the background noise level. |
| | Odour should not be detectable outside the utility's buffer zone around the treatment works. |
| Effluent Discharge/Bio-solids Management | The minimum performance standards for effluent discharge and bio-solids management are set by statutory requirements and regulations through licensing. |

**Source:** Essential Water, Strategic Plan (confidential), May 2018.

# J Draft decisions on trade waste charges

Table J.1 and Table J.2 show our draft decisions on trade waste charges. In 2019-20 and each subsequent year of the determination period, these charges will remain unchanged in real terms. That is, they would increase each year in line with inflation.

**Table J.1 IPART's draft decisions on trade waste fixed charges ($2019-20)**

| Description of charge | 1 July 2019 to 30 June 2020 |
|---|---|
| Annual Trade Waste fee for Category 1 Trade Waste Discharge | 97.63 |
| Annual Trade Waste fee for Category 1a Trade Waste Discharge | 97.63 |
| Annual Trade Waste fee for Category 2 Trade Waste Discharge | 196.28 |
| Annual Trade Waste fee for Category 3 Trade Waste Discharge | 656.98 |
| Annual Trade Waste fee per operating mine | 1,636.35 |
| Trade Waste discharge application fee | 241.03 |
| Trade Waste re-inspection fee | 89.50 |
| Food waste disposal charge | 30.51/bed |

**Note:** Prices should be adjusted annually by CPI.

**Table J.2 IPART's draft decisions on trade waste volumetric charges ($/kL, $2019-20)**

| Description of charge | 1 July 2019 to 30 June 2020 | 1 July 2020 to 30 June 2021 | 1 July 2021 to 30 June 2022 |
|---|---|---|---|
| Trade Waste usage charge for all categories of Trade Waste discharge | $0.18 | $0.37 x ($CPI_1$) | $0.55 x ($CPI_2$) |

# K Draft decisions on miscellaneous charges

Table K.1 shows our draft decisions on miscellaneous charges. In 2019-20 and each subsequent year of the determination period, these charges will remain unchanged in real terms. That is, they would increase each year in line with inflation.

**Table K.1 IPART's draft decisions on miscellaneous charges ($2019-20)**

| Ancillary and miscellaneous customer services | $2019-20 |
|---|---|
| **1. Conveyancing Certificate** | |
| Statement of outstanding charges | |
| a) Full certificate with meter read | 75.11 |
| b) Updated meter read request (special meter read) | 56.29 |
| c) Full certificate with history search | 132.21 |
| d) Urgent full certificate with meter read (within 48 hours) | 130.18 |
| **2. Meter Test** | 78.05 |
| Refunded if meter is ± 3% | |
| **3. Drainage Diagram** | 22.02 |
| **4. Plumbing Inspection** | 36.41 |
| **5. Plumbers application** | 38.90 |
| **6. Site inspection for water and sewerage** | 125.09 |
| **7. Statement of available water pressure** | 181.03 |
| **8. Building plan approval – extension** | 35.14 |
| **9. Building plan approval – new connection** | 53.09 |
| **10. Fire Service application** | 92.85 |
| **11. Relocation/increase in size of water service** (tapping fee) | 89.90 |
| **12. Backflow prevention device testing and certification** (per hour plus materials) | 75.26 |
| **13. Install Water Service** | |
| a) 20mm Service up to 3 metres | 770.89 |
| b) 20mm Service over 3 metres and less than 30 metres | 1,989.25 |
| c) All others | By quote |
| **14. Alter existing water service** | |
| a) Actual Cost | By quote |
| b) Relocate existing service | By quote |
| **15. Downgrade Meter Size** | |
| a) 25mm to 20mm | 99.11 |
| b) All others | By quote |
| **16. Repair damaged water service** | |
| a) First repair within 5 year period | Nil |
| b) Second and subsequent repairs (per hour plus materials) | 99.11 |
| **17. Rectification of Illegal Service** | 241.03 |
| **18. Replace Damaged Water Meter** | |
| (a) First replacement in a 5 year period | Nil |
| (b) 20mm | 115.94 |
| (c) 25mm | 228.83 |

| | |
|---|---|
| (d) 32mm | 332.56 |
| (e) 40mm | 801.40 |
| (f) 50mm | 999.71 |
| (g) 80mm | 1,098.36 |
| (h)100mm or greater | By quote |
| **19. Water Service Disconnection** | |
| a) First disconnect within 1 year period | Nil |
| b) Capping | 96.67 |
| c) 20mm to 25mm | 161.70 |
| d) 32m or greater | By quote |
| e) Bitumen Repairs ($ per metre) (minimum 1 metre) | 18.81 |
| **20. Water Service Reconnection** | |
| a) First reconnect within 1 year period | Nil |
| b) Un-capping | 103.73 |
| c) 20mm to 25mm | 173.91 |
| d) 32m or greater | By quote |
| e) Bitumen Repairs ($ per metre) (minimum 1 metre) | 18.81 |
| **21. Asset Location** | |
| a) Major or Critical Infrastructure (per hour) | 99.11 |
| b) Minor or non-critical Initial Location | Nil |
| c) Reinspect asset location (per hour) | 99.11 |
| **22. Relocate existing stop valve or hydrant** | By quote |
| **23. Replace water main before customer installations** | By quote |
| **24. Standpipe Hire** | |
| a) Monthly (Minimum Charge) | 32.04 |
| b) Annually | 384.43 |
| c) Water usage charges ($ per kL) | |
| i. Treated | 1.83 |
| ii. Untreated | 1.63 |
| **25. Personal Service of Final Warning Notice** | 21.92 |
| **26. Water Reconnections – after restrictions** | |
| a) during business hours | 94.58 |
| b) outside business hours | 131.19 |

# L 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 thousand 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 |