# 2019-23 Water and Sewerage Pricing Submission

**13 July 2018**

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# Overview

## Message from Essential Energy's CEO

This overview summarises Essential Energy's proposed four-year plan for operating and delivering Essential Water's water and sewerage services to around 10,000 customers in the Broken Hill area from 1 July 2019 to 30 June 2023.

Our plan has been shaped in consultation with customers and stakeholders to ensure we continue to deliver safe and reliable water supply and sewerage services, meet our legislative and environmental obligations and maintain customer service standards and price affordability.

To help further inform our business decisions, I encourage you to provide feedback on our submission at:

www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Prices-for-Essential-Energy%E2%80%99s-water-and-sewerage-services-in-Broken-Hill-from-1-July-2019

Our submission can be viewed at:

https://engage.essentialenergy.com.au/essential-water-ipart-submission.

Thank you,

[redacted]

**John Cleland**

**Chief Executive Officer**

# Our pricing proposal

This chapter provides a summary of our 2019-23 pricing proposal.

## Detailed chapters

Our proposal comprises this 'plain English' overview, twelve detailed chapters that cover the standard elements of a regulatory pricing proposal and detailed models and attachments.

The chapters, attachments and models provide the information required to enable full scrutiny by IPART in order to determine our prices for 2019–23.

All expenditure and revenue forecasts throughout the proposal are expressed in ‘real’ 2018-19 dollars (that is, they exclude inflation), with historical financials being in nominal dollars (that is, they include inflation). Comparisons between actual and allowed expenditures during the current regulatory period are stated in 2018-19 dollars to ensure a like-for-like comparison. Bill impacts are shown in nominal dollars unless otherwise stated.

## Our pricing website

A user-friendly and customer-focused website provides an interactive way for our customers to explore the key parts of our proposal.

The website also provides links to the overview document and the attachments.

Our proposal is available at https,//engage.essentialenergy.com.au/essential-water-ipart-submission.

# Introduction

Essential Energy's water and sewerage business, Essential Water, provides water and sewerage services to a population of approximately 18,000 people in the communities of Broken Hill, Menindee, Sunset Strip and Silverton.

We own and operate the Broken Hill area's network of dams, water treatment plants, sewage treatment plants, reservoirs, water and sewage pumping stations, mains and other related infrastructure.

We deliver drinking water to approximately 10,500 customers and sewerage services to approximately 9,700 customers.

The prices we charge for water and sewerage services in the Broken Hill region are regulated by the Independent Pricing and Regulatory Tribunal of NSW (IPART). IPART's current determination began on 1 July 2014 and expires on 30 June 2019.

Our pricing proposal for the next regulatory period – over four years, from 1 July 2019 to 30 June 2023 – has been developed in consultation with our customers.

It sets out Essential Water's proposed service levels, operating expenditure (opex) and capital expenditure (capex) programs, together with expected prudent and efficient costs, revenue requirements and pricing arrangements for water and sewerage services.

This overview provides a user-friendly summary of our 2019-23 pricing proposal, with further detail contained in separate chapters and attachments.

## Overarching objectives

In light of significant challenges facing the business and the community (outlined below), this submission is designed to balance the following objectives:

- deliver a safe and reliable water supply and sewerage service,
- maintain customer service standards,
- keep prices low, and
- achieve a reasonable commercial return for our shareholder.

## Our commitment

Essential Water is committed to providing safe, reliable, quality water and sewerage services at an affordable price for the 2019-23 determination period, while accommodating a generational shift in bulk water supply arrangements.

As discussed in our submission, we have successfully navigated our way through a fundamental re-prioritisation of our operations to connect the new Wentworth to Broken Hill pipeline, which has required changes to the design and ongoing maintenance of our existing water assets.

Our proposal has been informed by targeted consultation with customers and stakeholders and is in line with the key priorities identified in this process.

We face a number of significant challenges in proposing prices that are affordable to the community and that also enable us to maintain our service performance and achieve financial viability.

These challenges include:

- supplying a community affected by significant affordability pressures,
- the Wentworth to Broken Hill pipeline promises improvements in water security and availability, but its connection and integration requires additional investment in our network. Additionally, the future costs imposed on our network are uncertain and there is a risk that we may be unable to recover these costs through existing funding arrangements,
- the Wentworth to Broken Hill pipeline does not alleviate the need to invest and maintain our distribution network, the costs of which are rising,

  Essential Water is a loss-making business and is effectively subsidised by Essential Energy's electricity business. Prior to the current regulatory period, Essential Water received direct government funding of approximately $1.7 million per annum to offset these losses. This funding arrangement ceased in 2013,
- water forecasts were set too high at the 2014 determination and, when combined with two years of drought and associated water restrictions, have led to a revenue shortfall in the current regulatory period. Setting prices on a lower volume base will place additional strain on prices for the 2019-23 regulatory period,
- the need to invest in a new sewage treatment plant to replace the existing plant which is approaching 80 years of age,
- we face cost increases with limited ability for efficiency gains, such as for rising electricity and chemical costs that are largely beyond our control, and
- we have built efficiencies into our expenditure programs, but efficiencies alone are insufficient to keep prices at current levels while also maintaining acceptable service standards.

We have met these challenges by improving our asset management and business practices to find significant on-going reductions in our operating and maintenance costs.

This is reflected in proposed operating expenditure that is three per cent **below** IPART's allowances from the 2014 determination in constant dollar terms.

We are also proposing a responsible capital expenditure program that focuses on renewing ageing infrastructure to meet customer service standards and our legal (including environmental) obligations.

Our challenge is to continue to address customer affordability, while also ensuring we have sufficient funding to meet our service standard obligations and achieve financial sustainability.

The prices proposed in this submission are aimed at meeting this challenge.

## Objectives

Essential Water operates its water supply functions under the *Water Management Act 2000* and the *Water Management (General) Regulation 2011*.

Our objectives are to:

- provide safe and reliable drinking water in accordance with the Australian Drinking Water Guidelines,
- provide water and sewerage services that meet customers' needs for reliability, quality, environmental protection and performance,
- maintain a water and sewerage system that is safe for the community, customers and employees,
- provide a service for the discharge of trade waste,
- provide a high level of customer service, and
- minimise costs to Essential Water and the consequential impacts on customer prices.

## Our current tariff structure

Our current 2017-18 water tariffs for residential and commercial customers comprise:

- a fixed availability charge of $328 per annum, plus
- a flat water usage charge of $1.80 per per kilolitre (kL).

Our sewerage tariffs comprise:

- for residential customers,
  - a fixed availability charge of $536 per annum, and
- for non-residential customers,
  - a fixed availability charge of $765 per annum, multiplied by a discharge factor (70 per cent) calculated for each representative business type, and
  - a flat sewerage usage charge of $1.28 per kL.

## Our customers

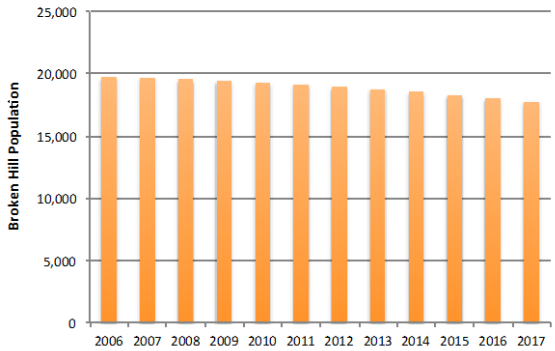
According to the Australian Bureau of Statistics (ABS), there are approximately 17,780 people living in Broken Hill.

Of these, 49 per cent are male and 51 per cent are female. Aboriginal and/or Torres Strait Islander people make up more than eight per cent of the population.

On average, the population in Broken Hill has decreased by one per cent each year since 2006.

The ABS data indicates that this is one of the fastest declining population centres in Australia.

Population of Broken Hill 2006-2016

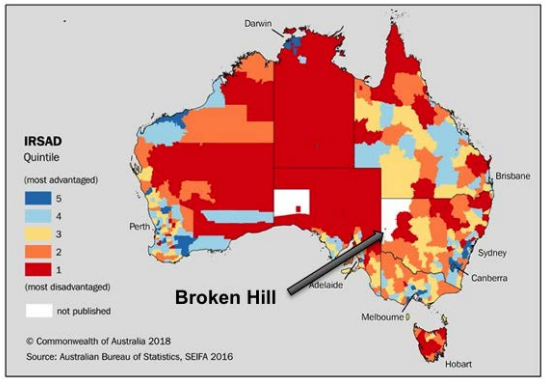



Source, Australian Bureau of Statistics (ERP) data

Broken Hill also has a high proportion (22 per cent) of its population that is 65 years of age or older. This is considerably higher than the State and national averages of about 16 per cent, and results in a relatively high proportion of Broken Hill's population being on a fixed income.

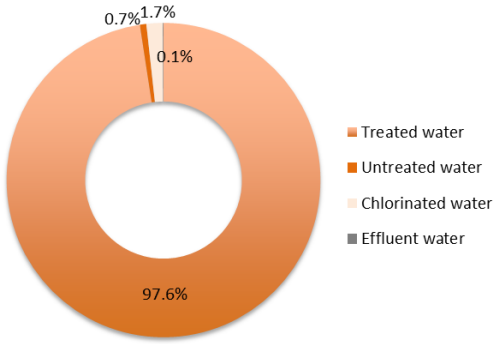
ABS analysis of 'Relative Socio-economic Disadvantage' in 2018 shows that Broken Hill placed in the lowest 10 per cent band in Australia (ranking 1,303 out of 13,691 state suburbs) and in NSW (ranking 372 out of 4112 state suburbs), with a score of 902 out of 1,000.

Addressing affordability and the impacts on disadvantaged customers will continue to be an important issue for the community, and Essential Water has taken this into account in developing its proposal. We have closely scrutinised our expenditure plans to ensure they are both necessary and efficient, to minimise the pressure on prices.




### Customer numbers

Approximately 10,500 customers receive their water supply from Essential Water.




Approximately 98 per cent of customers receive treated water, while one per cent of our customers receive untreated water and two per cent receive chlorinated water.

Residential customers make up 91 per cent of our water customers, and 93 per cent of our sewerage customers.

The mines play an important role in the local economy and are responsible for reducing tariffs to other customers by about a third, due to the application of IPART's mines pricing framework.

## Our environment

Essential Water's service area is one of the driest in the state and experiences extreme climate variations and frequent droughts.

Australian Bureau of Meteorology (BOM) data illustrate that, over the past 12 months, rainfall in the Broken Hill region has been less than 200 millimetres, consistent with longer term rainfall statistics.

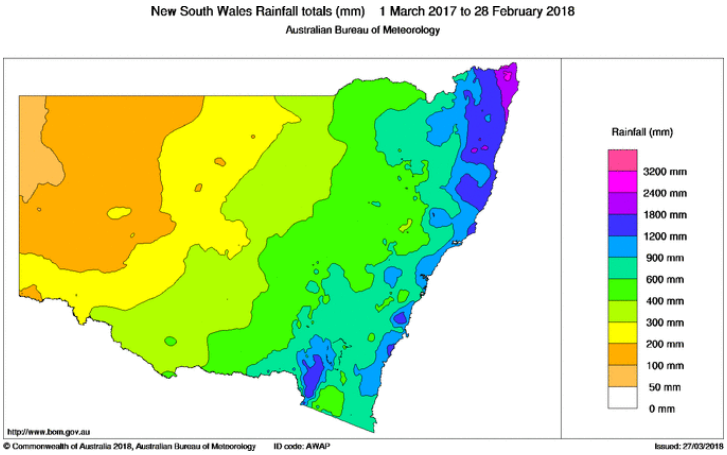
As outlined in Chapter 1 'Context and background', over the past 126 years the median annual rainfall in Broken Hill has been 204 millimetres, ranging from a low of 65 millimetres in 2002 to a high of 712 millimetres in 1974. This is one of the lowest rates in NSW.

Temperatures in the region are among the hottest in the country, with maximum temperatures often around 45 degrees Celsius. This results in annual evaporation of approximately 2,500 millimetres, which is more than ten times higher than the average annual rainfall.

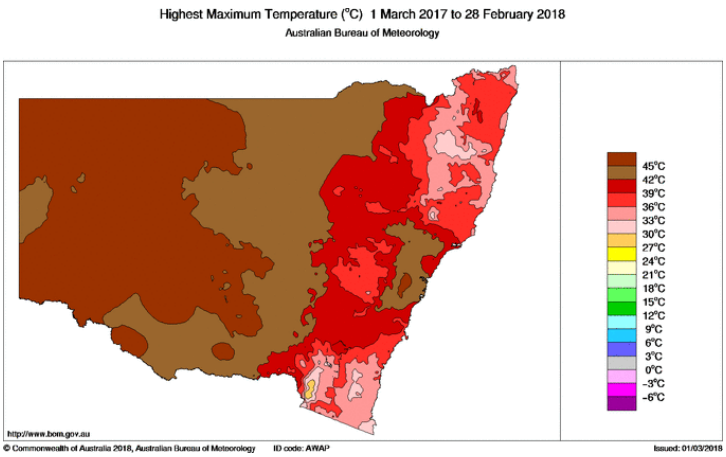
With low annual rainfall and extreme temperatures, it is not surprising that the region recently experienced the longest drought on record. This was just one of three droughts that the region experienced over the last 15 years.

These climate conditions mean that providing a safe and reliable water supply to the region is a challenge, but one that Essential Water, with the support of the NSW Government and the community, is well placed to meet.

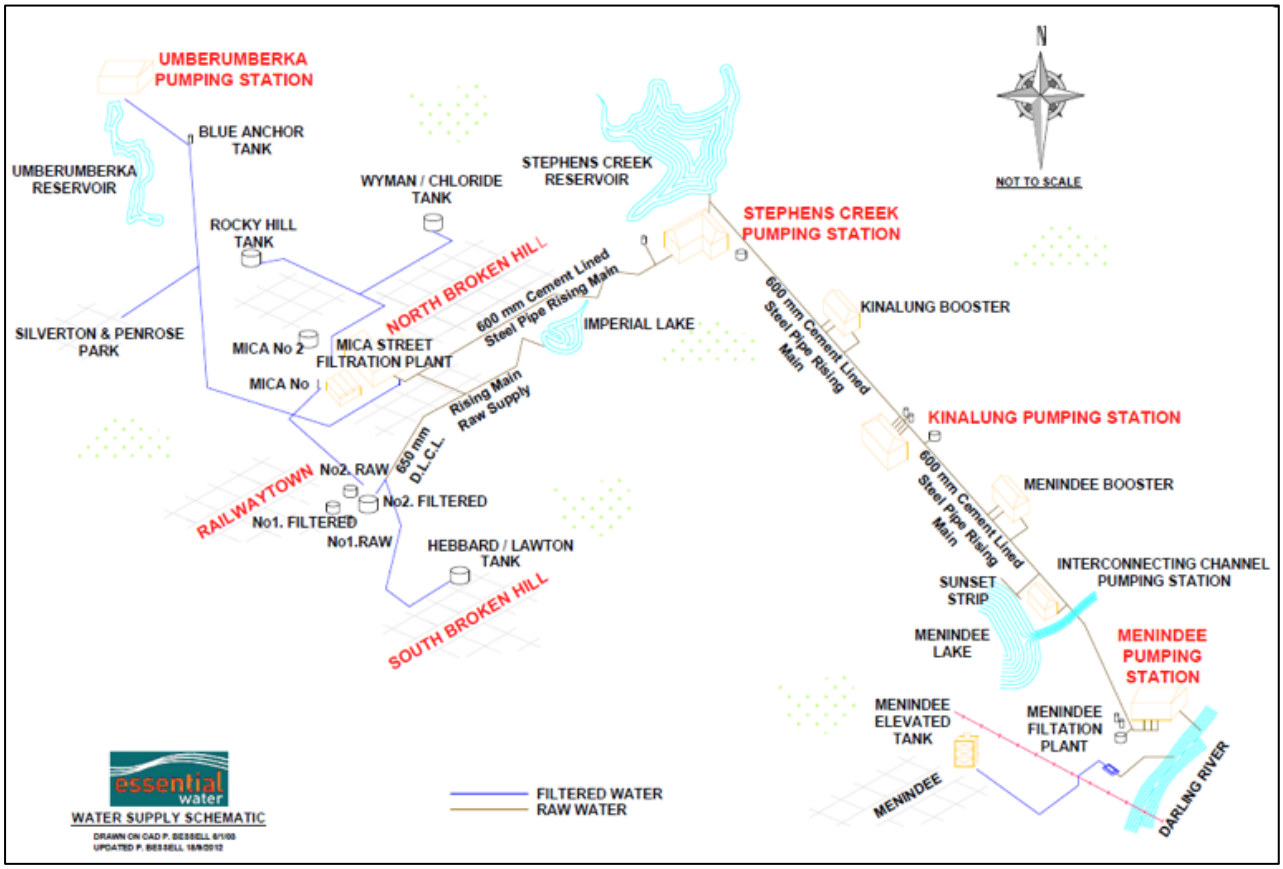
**NSW rainfall over the past 12 months**




**Maximum temperatures**



## Our current water and sewerage network




### Potable water supply

Before arriving at your tap, water that is safe to drink passes through many stages.

Currently, it is collected through river catchments and is pumped via one of nine pumping stations to our storage facilities, before being transferred for treatment at one of our water treatment plants.

The water is treated to a high standard at Essential Water's two water treatment plants, the first located at Mica Street in Broken Hill and the second at Menindee (our third treatment plant at Sunset Strip is not used for potable water).

After treatment, the water is sent via pumping stations and water mains to 12 urban water service reservoirs, where it is stored before being distributed to customers via a network comprising 220 kilometres of distribution pipelines.

From early 2019, the primary source of water will be the new Wentworth to Broken Hill pipeline. This change in bulk water supply arrangements is discussed in the following section.

Water will continue to be stored in the Stephens Creek and Umberumberka reservoirs.

We plan to decommission the reservoir at Imperial Lakes.

### Sewerage services

Sewage makes its way from homes and businesses through a 228 kilometre network of pipes to two sewage treatment plants, where it is treated and then used by our recycled water customers.

Essential Water's current major water and sewerage assets are outlined below.

***3 Dams***
* Stephens Creek (19 GL)
* Umberumberka (7.8 GL)
* Imperial Lake (0.7 GL)

***4 Bulk supply pipelines – 150 km***
* Menindee – Stephens Creek (99 km)
* Stephens Creek – Broken Hill (16 km)
* Imperial Lake - Broken Hill (5 km)
* Umberumberka - Broken Hill (30 km)

***220 km of reticulation mains***

***156 km of headworks transfer length***

***Silverton water chlorinator***

***9 Pumping stations***

***3 Balance tanks***

***12 Service reservoirs***

***Booster and pressure pumps***

***Approx. 10,500 customer water meters***

***Sewerage assets***

* ***228 km of reticulation mains***
* ***20 km sewer rising mains***
* ***3,400 man holes***
* ***11 sewerage pumping stations***
* ***11 km treated effluent mains***
* ***2 Sewerage treatment plants***

***3 water treatment plants***
* Mica St
* Menindee
* Sunset Strip

## New bulk water supply arrangements

Bulk water supply arrangements in Broken Hill will change in 2019.

As part of the NSW Government's commitment to secure the long-term water supply to the Broken Hill region, WaterNSW has appointed a consortium to design and construct a new 270-kilometre underground pipeline from Wentworth to Broken Hill (generally following the Silver City Highway).

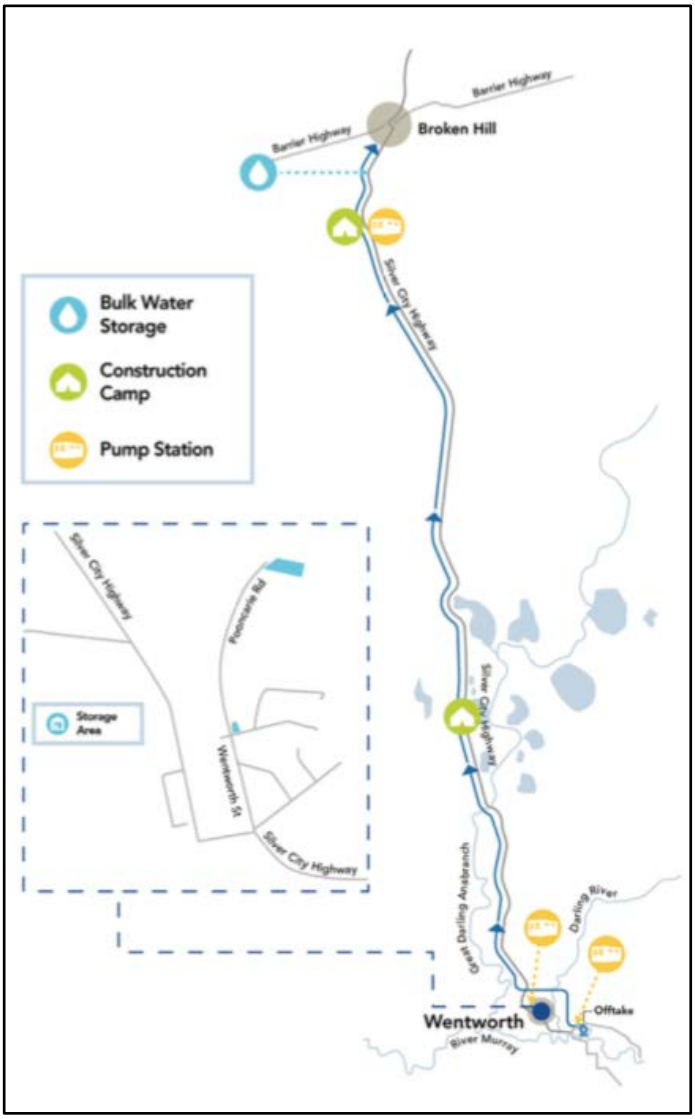
Construction commenced in January 2018 and is targeted for completion in December 2018.

Full commissioning is expected by April 2019.

Bulk water will be sourced near Wentworth, on the Murray River. The new pipeline will supply up to 37 megalitres of a peak daily demand to Essential Water.

The consortium appointed by WaterNSW will be responsible for the operation and maintenance of the Wentworth to Broken Hill pipeline.

Essential Water will continue to retain responsibility for water treatment and distribution to our customers.




Source, WaterNSW website

## Form of regulation

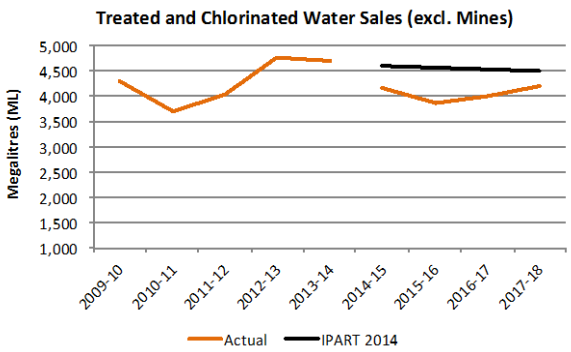
The 'form of regulation' describes the framework that IPART applies to determine the revenue Essential Water can earn and the prices it can charge over a regulatory period.

We propose the following features of a well-functioning regulatory framework that ensures an affordable water supply, while encouraging investment:

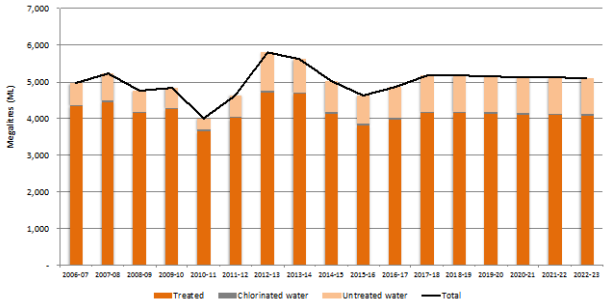
- a four-year regulatory period commencing on 1 July 2019,
- continuation of IPART's building-block framework and the use of the 'post-tax real' methodology,
- continuation of the current price cap form of price control,
- a demand volatility adjustment mechanism to apply from 1 July 2019 with a ± five per cent materiality threshold to manage significant volume variations from forecasts,
- cost pass-through mechanisms to deal with unexpected, uncontrollable events to provide an appropriate balance in the allocation of risks between Essential Water and customers, and
- reliance on the inherent incentives in the regulatory framework without additional incentive mechanisms in recognition of the unique characteristics of the Essential Water business.

### Sales and customer number forecasts

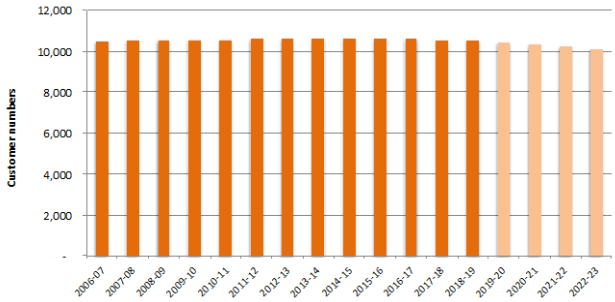
Water sales over the current regulatory period are tracking significantly below IPART's allowed sales (1,424 megalitres or 12 per cent) from the 2014 determination period.




Total water sales are forecast to decline by 0.4 per cent per year over the 2019-23 period.




Water (shown below) and sewerage customer numbers are forecast to reduce by one per cent per year, in line with the population trend.




Our customer growth and sewer connections are consistent with the population and household reductions over the past few years, as evidenced in government information (e.g. ABS data).

Residential usage per customer is forecast to remain relatively constant at around 260 kilolitres per customer per year.

## What our customers told us

To ensure we receive insights into our plans for our 2019-23 proposal from a representative group of residential and business customers, we implemented a tailored engagement program.

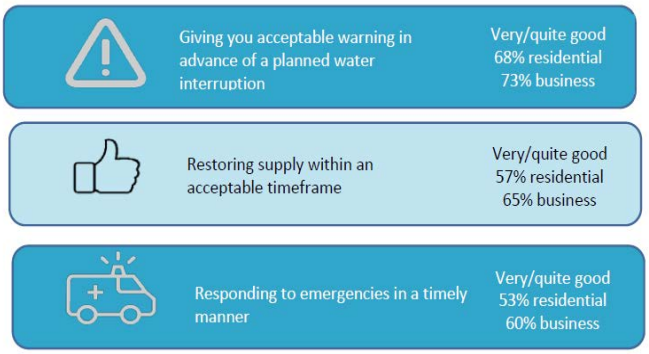
This program – based on our Stakeholder Engagement Framework and developed in consultation with key stakeholders – takes into account IPART's customer consultation requirements, stipulated in its Guidelines for Water Agency Pricing Submissions.

Our engagement program has incorporated telephone and online surveys and discussions with Essential Water's Customer Council (representing Broken Hill City Council, Broken Hill Health Council, Broken Hill Chamber of Commerce, Broken Hill mining industry, Pastoralists Association of West Darling and Menindee, Sunset Strip and Copi Hollow communities).

We also engaged external experts to undertake independent research and analysis and summarise feedback.

All feedback we received from customers and community members has been carefully considered.

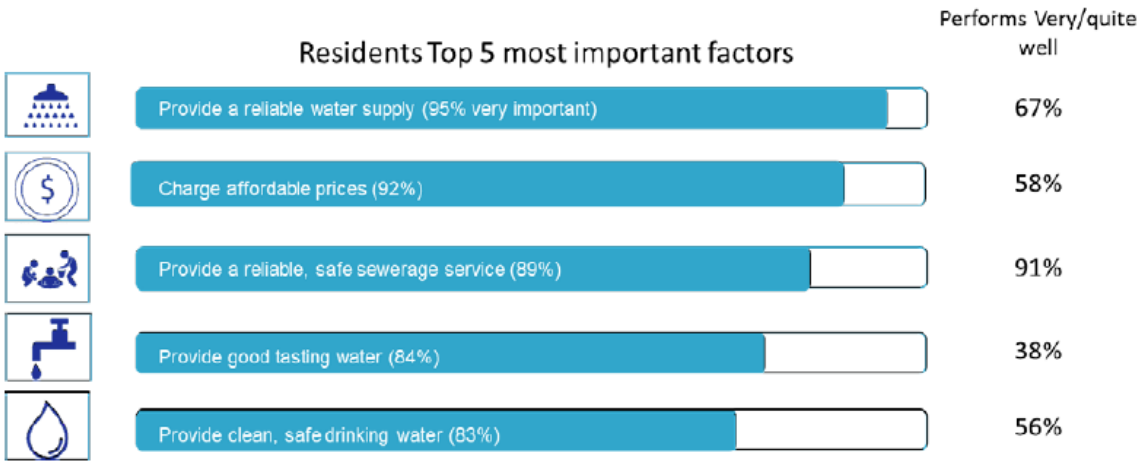
### What we do well




Reliability of water supply and affordability were the two most important factors for residential customers.

The next most important factors were providing a reliable and safe sewerage service, providing good tasting water, and provision of clean, safe drinking water.

Residential customers agreed that Essential Water performs well in terms of reliability of water supply, but can improve on the quality of water, especially taste.



## How our bills compare

We strive to ensure that our customers receive a safe and reliable quality water supply at an affordable price.

The chart below illustrates how Essential Water's bills compare with other water providers in NSW and Australia.

The information is based on internal analysis, with information sourced from company websites and government performance monitoring reports.

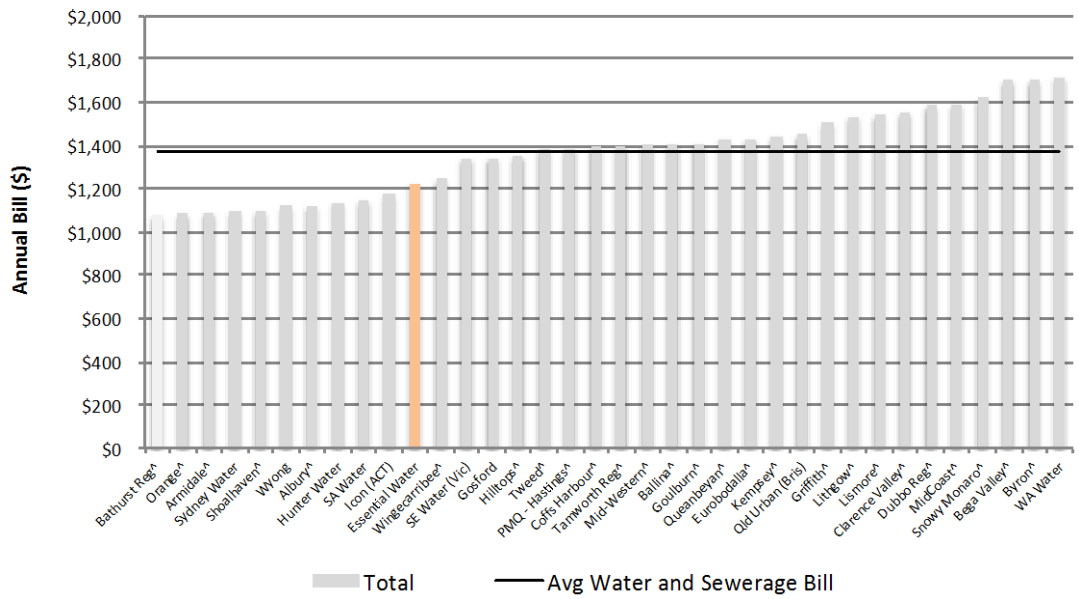
As shown below, the average annual water and sewerage bill for the 36 water utilities examined across Australia is $1,369. Essential Water's bill of $1,223 is significantly (11 per cent) below the average.

In this benchmarking analysis, Essential Water's combined water and sewerage bill ranked **11th lowest out of the 36 water utilities** examined, placing us in the lower third of bill outcomes.

While bill benchmarking is only one tool to assess issues of affordability, it does highlight that Essential Water's bills are lower than the average compared to other water utilities in NSW and in Australia.

Our challenge is to continue to address customer affordability while also ensuring we have sufficient funding to meet our service standard obligations and achieve financial sustainability.

**Bill benchmarking – Combined water and sewerage bill**




Source: Current bills sourced from IPART Determinations and Company websites.
Note: ^ Sourced from 2015/16 DPI Water S&W Performance Monitoring Report. Pg 81-82.

## How prices are set

Essential Water's water and sewerage prices are set by IPART and are calculated using the building-block method.

This involves the following steps,

1. Identify cost building-blocks – operating expenditure, return on capital, return of capital (depreciation), allowance for working capital and an allowance for corporate income tax – which together make up our **notional revenue requirement.**
2. Set **target revenue** – by adjusting the notional revenue requirement to smooth or balance annual revenues.
3. Calculate the **net revenue** – by adjusting our target revenue to account for revenue from the mines and other revenue, such as liquid trade waste, and miscellaneous charges.
4. Forecast the **demand** for our services – water customer numbers and water sales volumes, sewerage customer numbers and billable sewerage volumes.
5. Divide our net revenue requirement by forecast demand to get our **prices**.

**Our cost building blocks**

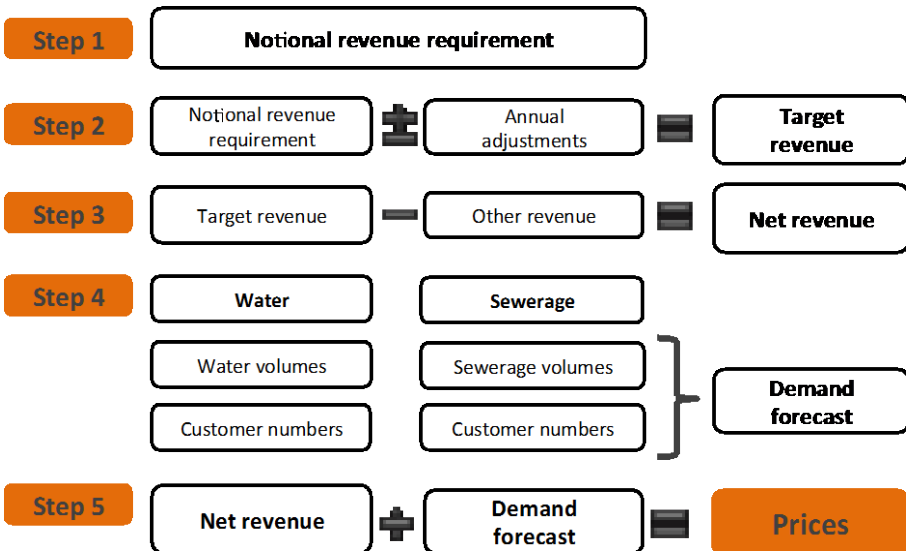
**Operating costs** are the day-to-day costs of running our water and sewerage networks – such as staff salaries, chemicals for water treatment and electricity to pump water and sewage.

**Return on capital** covers the cost of servicing our debt and provides a return to our shareholders. This is calculated by multiplying our regulated asset base (RAB) – which records the value of our water and sewerage assets – by the weighted average cost of capital (WACC).

**Depreciation** (or return of capital) acknowledges that our assets wear out over time.

**Working capital** reflects the holding costs of current assets.

**Corporate income tax** costs are our tax liabilities net of the value of imputation credits.



## Service standards

Our service performance – notably, network reliability, drinking water quality and customer service – is a key customer priority.

Essential Water has a number of specific service standards, or targets, against which our performance is measured on an annual basis. These standards largely reflect a combination of two drivers:

- achieving the levels of service that customers want, and
- compliance with various technical, environmental and consumer protection regulatory obligations.

Compliance with our service standards and regulatory obligations is a major driver of the costs we incur in the construction, operation and maintenance of our water and sewerage network.

Essential Water has the following customer service level targets:

- **Availability of water supply** – minimum pressure of 15 metres head of water, water restrictions no more than 5 per cent of the time and 3,000 litres per tenement per day for residential potable water.
- **Water quality** – meet Australian Drinking Water Guidelines, meet public health standards for bacteria, contaminant and pathogens and comply with our Drinking Water Utility Licence.
- **Response times** – stated response times for four priority categories, ranging from critical (30 minutes) to minor (within two weeks as agreed with the customer).
- **Sewerage** – targets for availability of sewerage services, average system failures, response times, odours / vectors, impact of sewerage treatment plants (notice and odour) and effluent discharge.
- **Complaints** – respond to 95 per cent of complaints and enquiries within four working days of receipt.
- **Notice periods** – residential customers are given at least two days' notice of planned interruptions, while non-residential customers are given at least seven days' notice.
- **Duration of planned interruptions** – four hours for most works, with seven hours for mains replacement in Broken Hill. Other areas have a maximum duration of six hours for planned interruptions.
- Maximum number of planned interruptions – two per customer per year (excludes mains construction as interruption occurs daily until the replacement is complete).

### Current performance

Essential Water has met or outperformed all of the key service targets over the past 12 months and maintained a high standard of service performance over the current regulatory period.

There is a high level of satisfaction among our customers, as assessed through our customer engagement program.

### Targets for 2019-23

Although we are planning to keep costs down in the 2019-23 period, we will need to balance cost savings and service quality.

This will not, however, be at the expense of water quality and our legislative obligations will continue to be met.

Our proposed service standard targets for 2019–23 can be found in Chapter 3 'Service standards'.

## Capital expenditure

Total capital expenditure (capex) for the current regulatory period to the middle of 2018 is forecast to be $36 million ($2018-19). This is $6 million, or 15 per cent below IPART's allowance for the current period of $43 million ($2018-19).

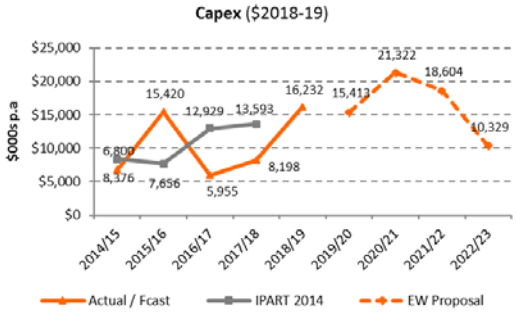
This underspend was largely due to work not undertaken given uncertainty about the scope and timing of the new pipeline. This amount was, however, more than offset by the $14 million in emergency drought works undertaken to maintain water supply to our customers. This was funded directly by the NSW Government.

Going forward, we have proposed a capex program of $66 million ($2018-19) for the 2019-23 regulatory period. This includes capex for water services of $22 million, capex for sewerage services of $40 million and capex for non-system assets of $4 million.

The largest and most significant project is the $34 million Wills Street wastewater treatment plant. Built in the 1930s, the plant is nearing the end of its useful life and needs to be replaced to ensure we can comply with our environmental obligations.

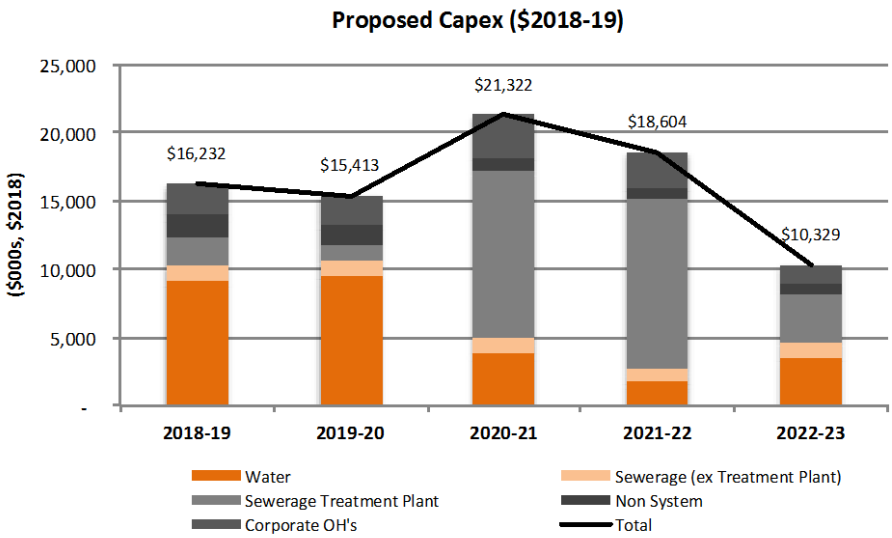
The new wastewater treatment plant represents over half of our proposed capex program. Without it, our total proposed capex would be $31 million, 26 per cent, **below** IPART's approved capex for the 2014 period and 14 per cent **less** than our actual / forecast spend in the current period.

Other key projects include replacement of the Menindee water treatment plant and the Rocky Hill No. 2 service reservoir, plus three service reservoir refurbishments.




Consequential works required to integrate the new Wentworth to Broken Hill pipeline into the existing Essential Water assets are forecast to be $59 million during 2019-23. The NSW Government has established the Project Restart fund to enable high priority infrastructure projects to be funded and delivered. We are seeking separate Government funding of our consequential works program through this funding mechanism to minimise the impact on customer prices.

Our proposed capex program, revenue and tariffs in this submission therefore exclude the consequential works program.



## Operating expenditure

Total operating expenditure (opex) for this current regulatory period to the middle of 2019 is forecast to be $67 million ($2018-19). This is $8 million, or 14 per cent, above IPART's allowance for the current period.

The main drivers of the increase included higher than forecast electricity costs due to increased pumping and significant increases in retail contract prices. The cost of chemicals (chlorine is produced by passing electricity through salt water) has also increased in line with electricity costs.

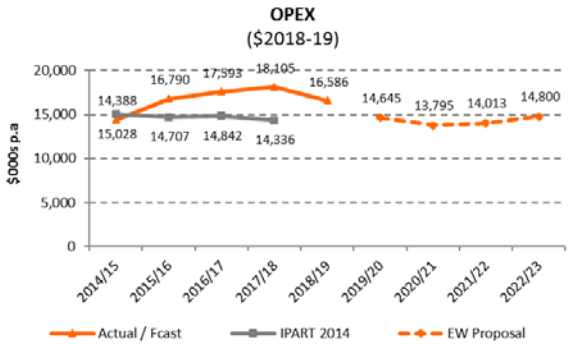
Proposed opex for 2019-23 is $57 million ($2018-19), or a 3 per cent **reduction** on IPART's 2014 determination allowances.

Our proposed opex been partially offset by wage growth, which has been on average 1.5 per cent (below IPART's forecast CPI) each year for six years under the current Enterprise Agreement. Electricity costs are expected to reduce with the new pipeline.

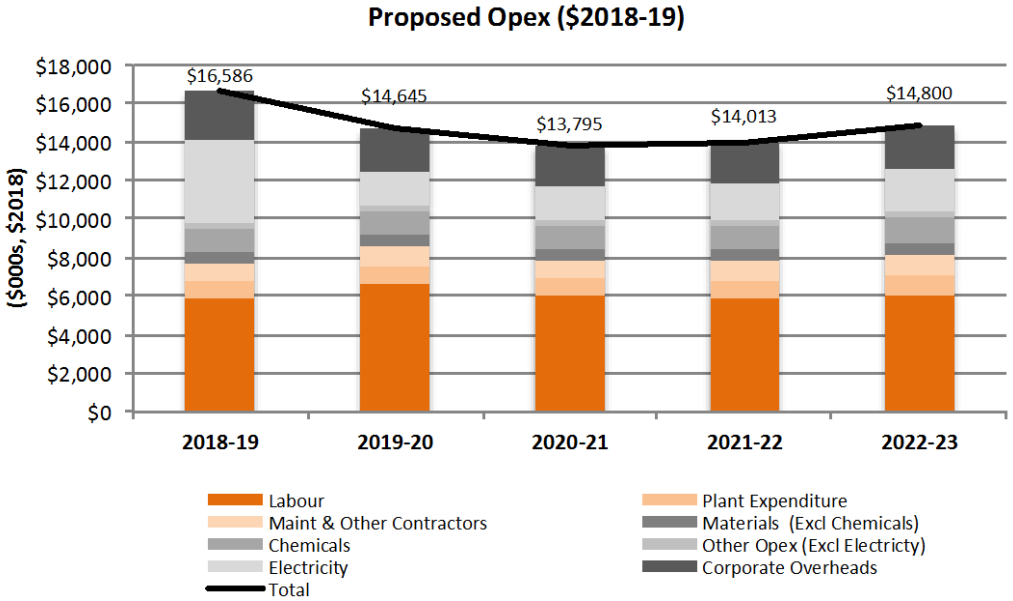
Our proposed opex has also been reduced through a significant efficiency program over the past three years, including a reduction in staff numbers through a hiring freeze and natural attrition, and reductions in overtime, agency staff, fleet, call-outs and travel costs.

Operational savings are also forecast due to the planned decommissioning of the Menindee pipeline and associated pumping stations between Menindee and Stephens Creek.

Further efficiency improvements can be made, but are dependent on the final arrangements for the Wentworth to Broken Hill pipeline.




More detail on our proposed opex program for the 2019-23 period is contained in Chapter 8 'Operating expenditure'.



## Return on capital

The return on capital covers the cost of servicing our debt and provides a return to our shareholders for their equity investment in our business.

It is calculated by multiplying the value of our regulated asset base by the rate of return – commonly known as the 'weighted average cost of capital', or WACC.

### Why it is important

If the rate of return is set too low, we may not be able to secure the funds needed to invest in water supply. This could negatively impact water quality, reliability, and customer service levels. If it is set too high, our customers could pay too much for our services.

Our proposed rate of return for the 2019-23 regulatory period reduces from 4.5 per cent to 4.0 per cent over the period based on IPART's post-tax real framework. This is well below our current allowed rate of return of 5.2 per cent, largely due to lower interest rates since 2014.

The rate of return will be updated to reflect market rates closer to the start of the new determination period and will then be updated each year for changes in debt costs. More information on our proposed WACC can be found in Chapter 9 'Rate of return'.

| Parameter | Proposed 2019-20 |
|---|---|
| Nominal risk-free rate | 3.4% |
| Debt margin | 2.5% |
| Cost of debt | 5.9% |
| Market risk premium | 7.6% |
| Equity beta | 0.70 |
| Cost of equity | 8.7% |
| Gearing | 55% |
| Corporate tax | 30% |
| Gamma | 0.25 |
| Inflation | 2.5% |
| Post-tax nominal WACC | 7.2% |
| **Post-tax real WACC** | **4.5%** |

Source, Essential Water analysis

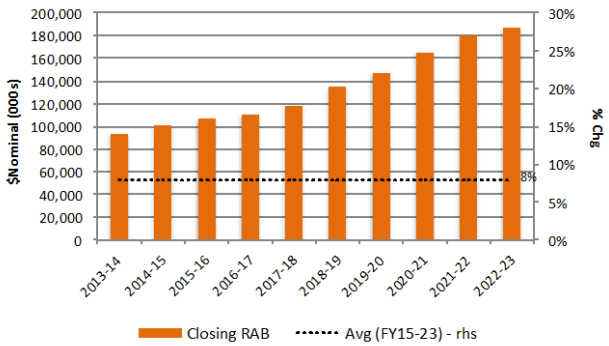
## Regulatory asset base

The regulatory asset base (RAB) reflects the written-down value of efficient capital expenditure that Essential Water has incurred to provide water and sewerage services to customers in the Broken Hill region.

The RAB provides the basis for calculating both the return on capital and the return of capital (i.e. depreciation), two of the key building blocks that comprise Essential Water's total revenue requirement.

The proposed RAB is calculated using the same methodology as used in IPART's current determination. The opening value of the combined RAB for 2019–20 is $135 million.

The closing value of the RAB for each year of the 2019-23 regulatory period for combined water and sewerage services is shown below.




The closing RAB has increased by approximately eight per cent per year based on the level of capital additions and the impact of inflation outstripping annual depreciation and disposals.

## Revenue requirement

The following tables summarise our proposed **notional revenue requirement** for Essential Water's total efficient costs over the 2019-23 determination period.

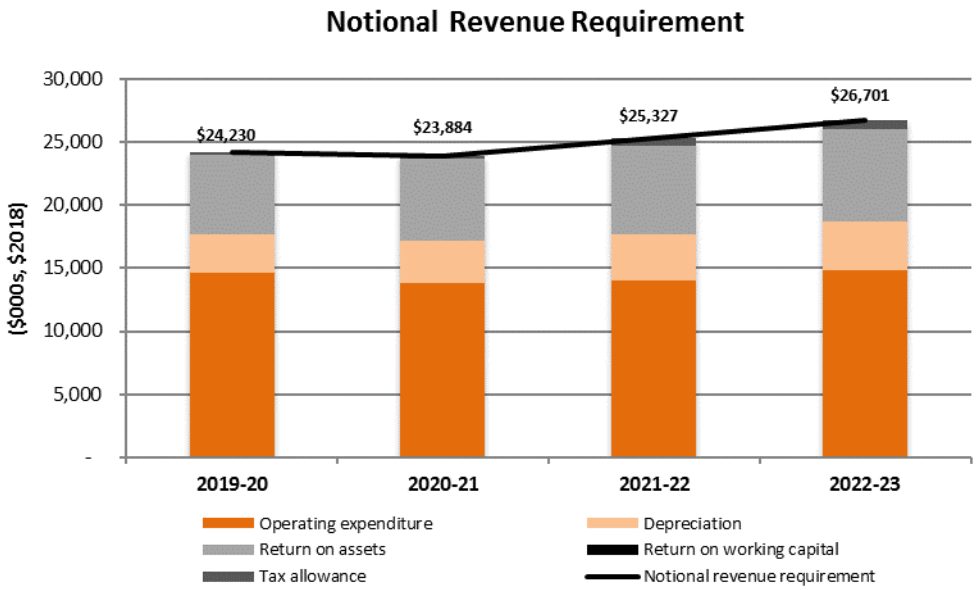
The **target revenue** is the expected amount of money raised by Essential Water through the charges set by IPART. It includes revenue from:

- water and sewerage charges to all customers (including mines) to whom Essential Energy provides water and sewerage services,
- trade waste charges to those non-residential customers to whom Essential Energy provides liquid trade waste services, and
- ancillary and miscellaneous charges on particular transactions.

Revenue from the mines, trade waste charges and ancillary and miscellaneous charges are subtracted from Essential Water's target revenue prior to setting all other water and sewerage charges.

This is to ensure that revenue received from other fees and charges is not also included in our proposed water and sewerage prices.

More information on our forecast revenue requirement can be found in Chapter 11 'Revenue requirement'.




| $000 $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Operating expenditure | 14,645 | 13,795 | 14,013 | 14,800 | **57,254** |
| Depreciation | 3,033 | 3,342 | 3,667 | 3,906 | **13,948** |
| Return on assets | 6,296 | 6,513 | 7,026 | 7,279 | **27,115** |
| Return on working capital | 22 | 2 | 16 | 48 | **87** |
| Tax allowance | 234 | 231 | 605 | 668 | **1,738** |
| **Notional revenue requirement** | **24,230** | **23,884** | **25,327** | **26,701** | **100,142** |
| **Target revenue** | **23,061** | **24,351** | **25,713** | **27,149** | **100,274** |

## Proposed tariffs

Our proposed tariffs – developed to promote pricing efficiency and shaped by community feedback – are summarised below,

### Water tariffs

- We retain the existing water tariff structure,
- water usage charges are based on long run marginal cost (LRMC) as the starting point, and then are adjusted for environmental sustainability and customer preferences,
- our current water usage charge of $1.80 per kL is adjusted by the average X factor each year during the 2019-23 period, and
- we maintain the approach to pricing for mining customers from the current determination.

### Sewerage tariffs

- We retain the existing sewerage tariff structure and adjust our current sewerage usage charge of $1.28 per kL by the average X factor each year.

### Treatment of exempt customers

Under the *Water Management Act 2000*, certain customers, such as some schools, hospitals, churches, and charity organisations, are exempt from paying access charges. This means we cannot charge these customers an access charge. As IPART includes exempt customer numbers when calculating our availability charges, and we are not able to charge exempt customers the availability charge, we are unable to recover our efficient costs without seeking Government funding or setting separate cost-reflective tariffs for these customers.

The amounts are not trivial. We estimate that the foregone revenue is in the order of $0.4 million per year.

We seek the opportunity to work with IPART to resolve this matter in the lead-up to the draft determination.

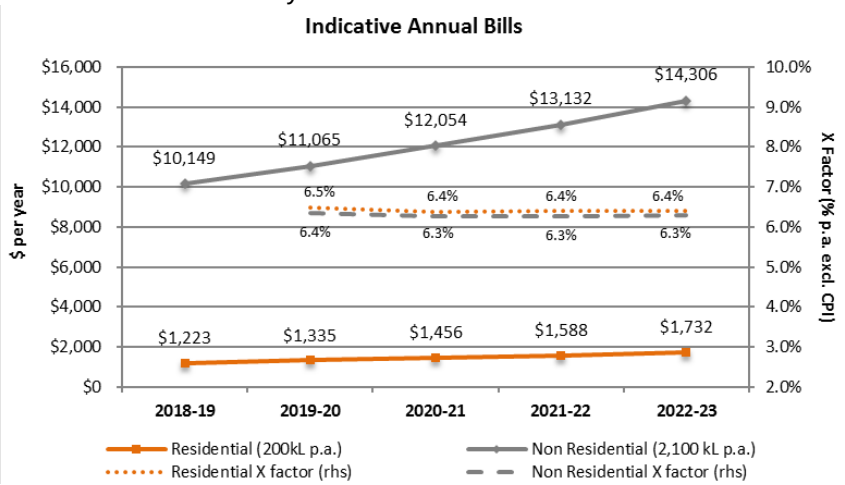
### Bill impacts

A typical residential customer consuming 200 kL of water per year would see an average annual increase in their combined water and sewerage bill of 9.1 per cent (6.4 per cent excluding inflation), or $127 per year.

A typical non-residential customer consuming 2,100 kL of water per year would see an average annual increase in their combined water and sewerage bill of 9.0 per cent (6.3 per cent excluding inflation), or $1,039 per year.

More information on our proposed tariffs can be found in Chapter 12 ‘Tariffs and price path’.

Forecast impacts on indicative water and sewerage bills for customers are set out below.




Notes: Nominal dollar terms, assuming 2.5 per cent forecast inflation and no pass-through adjustments

# Chapter 1 – Context and Background

# 1 EXECUTIVE SUMMARY

The key outcome of Essential Water's 2019-23 pricing proposal is to provide safe, reliable and quality water and sewerage services at an affordable price in light of a generational change in water supply arrangements.

We have successfully re-prioritised our operations to connect the new Wentworth to Broken Hill pipeline, changing the design and ongoing maintenance of our existing water assets.

Our pricing proposal has been informed by consultation with customers and stakeholders and is in line with the key priorities identified in our operational change process. However, we face a number of significant challenges in proposing prices that are affordable to the community and that maintain our service performance and achieve financial viability.

## Challenges

The challenges we face include:

- supplying a community affected by significant affordability pressures,
- the Wentworth to Broken Hill pipeline promises improvements in water security and availability, but its connection and integration requires additional investment in our network. Additionally, the future costs imposed on our network are uncertain and there is a risk that we may be unable to recover these costs through existing funding arrangements,
- the Wentworth to Broken Hill pipeline does not alleviate the need to invest and maintain our distribution network, the costs of which are rising,
- Essential Water is a loss-making business and is effectively subsidised by Essential Energy's electricity business. Prior to the current regulatory period, Essential Water received direct government funding of approximately $1.7 million per annum to offset these losses. This funding arrangement ceased in 2013,
- water forecasts were set too high at the 2014 determination and, when combined with two years of drought and associated water restrictions, have led to a revenue shortfall in the current regulatory period. Setting prices on a lower volume base will place additional strain on prices for the 2019-23 regulatory period,
- the need to invest in a new sewage treatment plant to replace the existing plant which is approaching 80 years of age,
- operating in a region that is one of the hottest and driest in the country, placing pressure on ensuring water availability and quality is at an acceptable level,
- we face cost increases with limited ability for efficiency gains, such as for rising electricity and chemical costs that are largely beyond our control, and
- we have built efficiencies into our expenditure programs, but efficiencies alone are insufficient to keep prices at current levels while also maintaining acceptable service standards.

We have met these challenges by improving our asset management and business practices to find significant ongoing reductions in our operating and maintenance costs. This is reflected in proposed operating expenditure that is three per cent **below** IPART's allowances from the 2014 determination in constant dollar terms.

We are also proposing a responsible capital expenditure program that focuses on renewing ageing infrastructure to meet customer service standards and our legal (including environmental) obligations.

Essential Water has not included the costs of our consequential works program (incurred as a consequence of installation of the Wentworth to Broken Hill pipeline) as we consider these are better addressed through separate Government funding arrangements, which we are currently pursuing.

Our challenge is to continue to address customer affordability, while also ensuring we have sufficient funding to meet our service standard obligations and achieve financial sustainability.

The prices proposed in this submission are aimed at meeting this challenge.

## Summary

The key elements of Essential Water's submission are summarised below:

- **Our customers** - According to the Australian Bureau of Statistics (ABS), there are approximately 17,780 people living in Broken Hill. The population in Broken Hill has decreased by one per cent on average each year since 2006, and the ABS indicates that this is one of the fastest declining population centres in Australia.

  Broken Hill also has a high proportion (22 per cent) of its population that is 65 years of age or older. This is considerably higher than the State and national averages of about 16 per cent, and results in a relatively high proportion of Broken Hill's population being on a fixed income.

  Australian Bureau of Statistics (ABS) analysis of Relative Socio-economic Disadvantage in 2018 shows that Broken Hill is relatively more economically disadvantaged than many other communities in Australia. Broken Hill placed in the lowest 10 per cent band in Australia (ranking 1,303 out of 13,691 State suburbs) and in NSW (ranking 372 out of 4112 State suburbs).

  Addressing affordability and pricing impacts on disadvantaged customers will continue to be an important issue for the community and we have taken this into account in developing our proposal.

- **Our environment** - Essential Water's service area is one of the driest in the state and experiences extreme climate variations and frequent droughts. Over the past 126 years, the median annual rainfall in Broken Hill has been 204 millimetres, which is one of the lowest rates in NSW. Temperatures in the region are among the hottest in the country, with maximum temperatures often around 45 degrees Celsius. This results in annual evaporation of approximately 2,500 millimetres, which is more than ten times higher than the average annual rainfall.

  These climatic conditions make supplying safe and reliable water to the region a challenge, but one that Essential Water, with the support of the NSW Government and the community, is well placed to meet.

- **New water supply arrangements** - Bulk water supply arrangements in Broken Hill are changing from 2019 following commissioning of the new Wentworth to Broken Hill pipeline (being constructed and to be operated by WaterNSW).

  The 270-kilometre pipeline will supply 37 megalitres of peak daily demand of raw water to Essential Water. We will continue to retain responsibility for water treatment and water distribution to our customers. Construction of the pipeline commenced in January 2018 and is targeted for completion in December 2018. Full commissioning is expected by April 2019.

  We propose to pass through the IPART-approved WaterNSW bulk water transportation charges as part of the annual pricing process. We have made the assumption that the NSW Government will fully fund the efficient costs of the Wentworth to Broken Hill pipeline as determined by IPART in its concurrent WaterNSW determination.

- **Form of regulation** - Essential Water proposes the following features of a well-functioning regulatory framework: a four-year regulatory period starting on 1 July 2019; continuation of IPART's building block framework and the use of the 'post-tax real' methodology, continuation of the current price cap form of price control, and a demand volatility adjustment mechanism to apply from 1 July 2019 with a ± five per cent materiality threshold to manage significant volume variations from forecasts.

  We propose four cost pass through events to deal with unexpected, uncontrollable events to provide an appropriate balance in the allocation of risks between Essential Water and customers: a regulatory change event, a drought relief event, a Wentworth to Broken Hill pipeline event and a consequential works event. Our proposed pass through framework is symmetric, in that it applies to both positive and negative cost events, and contains a materiality threshold of ± 2.5 per cent of the annual revenue requirement.

- **Forecast sales and customer numbers** - Water sales over the current regulatory period are tracking 12 per cent below IPART's allowed sales from the 2014 determination period. Addressing this volume reduction will place upward pressure on bills during 2019-23 when prices are reset.

Total water sales are forecast to decline by 0.4 per cent per year, while water and sewerage customer numbers are forecast to reduce by one per cent per year. Our customer growth and sewer connections are consistent with the population and household reductions over the past few years, as evidenced in government information (e.g. ABS data).

Residential usage per customer is forecast to remain relatively constant at around 260kL per customer per year.

- **Customer and stakeholder engagement** - We developed a tailored engagement program to ensure we heard from a representative group of residential and business customers to provide insights into our plans for the 2019-23 submission. Water supply reliability and affordability were the two most important factors for residential customers. The next most important factors were providing a reliable, safe sewerage service, providing good tasting water, and provision of clean, safe drinking water.

  Our customer survey showed that Essential Water performs well in terms of water supply reliability, but can improve on the quality of water, especially taste. We anticipate that the new bulk water supply arrangements should address customers' concerns regarding water quality.

- **How our bills compare** - In a benchmarking analysis undertaken by Essential Water, our combined water and sewerage bill ranked 11$^{th}$ lowest out of the 36 water utilities examined, placing us in the lowest third of bill outcomes.

  While bill benchmarking is only one tool to examine affordability, it does highlight that Essential Water's bills are lower than the average compared to other water utilities in NSW and Australia. Our challenge is to continue to address customer affordability while also ensuring we have sufficient funding to meet our service standard obligations and achieve financial sustainability.

- **Service standards** - Essential Water has met or outperformed all of our key service targets over the past 12 months and maintained a high standard of service performance over the current regulatory period.

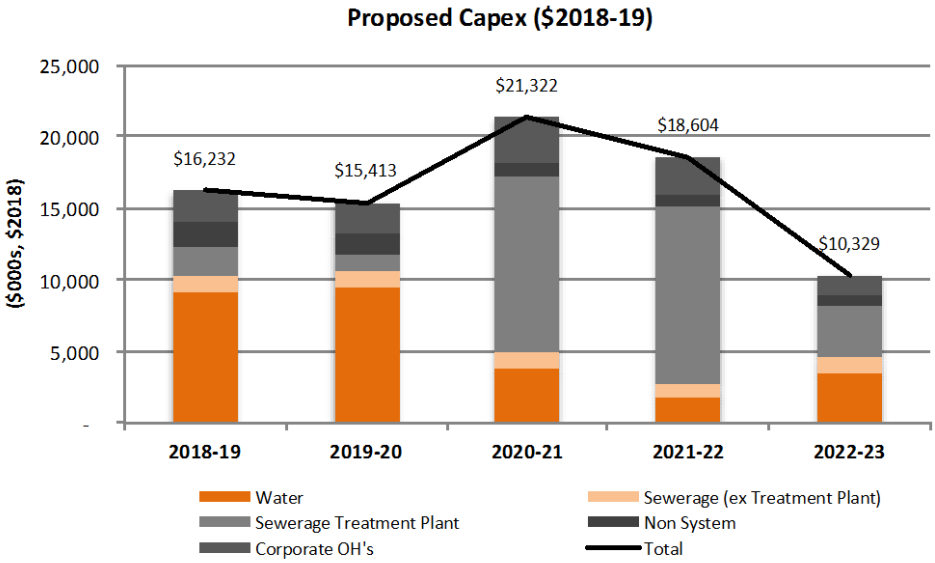
  Although we are planning to keep costs down in the 2019-23 period, we will need to balance cost savings and service quality. This will not, however, be at the expense of water quality and our legislative obligations will continue to be met.

- **Capital expenditure** - Total capital expenditure (capex) for this current regulatory period to the middle of 2019 is forecast to be $36 million ($2018-19). This is $6 million, or 15 per cent, below IPART's allowance for the current period of $43 million ($2018-19).

  This underspend was largely due to work not undertaken given uncertainty about the scope and timing of the new pipeline. This amount was, however, more than offset by the $14 million in emergency drought works undertaken to maintain water supply to our customers. This was funded directly by the NSW Government and not included in IPART's reporting and tariff setting processes.

  Going forward, we have proposed a capex program of $66 million ($2018-19) for the 2019-23 regulatory period (excluding consequential works). This includes capex for water services of $22 million, capex for sewerage services of $40 million and capex for non-system assets of $4 million.

  The largest and most significant project is the $34 million Wills Street wastewater treatment plant. Built in the 1930s, the plant is nearing the end of its useful life and needs to be replaced to ensure we can comply with our environmental obligations. The new wastewater treatment plant represents over half of our proposed capex program. Without it, our total proposed capex would be $31 million, 26 per cent, **below** IPART's approved capex for the 2014 period and 14 per cent **less** than our actual / forecast spend in the current period.

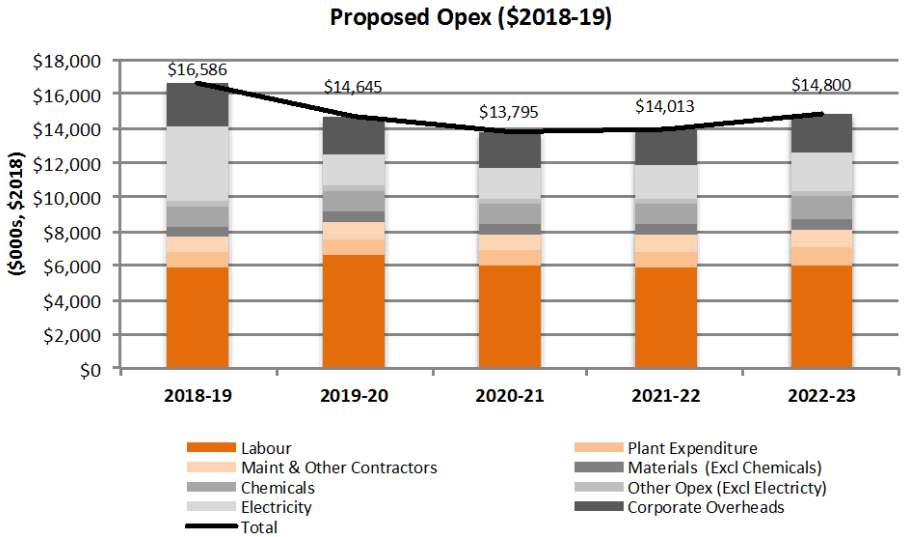



- **Operating expenditure** - Total operating expenditure (opex) for this current regulatory period to the middle of 2019 is forecast to be $67 million ($2018-19). This is $8 million, or 14 per cent, above IPART's allowance for the current period.

  The main drivers of the increase included higher than forecast electricity costs due to increased pumping and significant increases in retail contract prices. The cost of chemicals (chlorine is produced by passing electricity through salt water) has also increased in line with electricity costs.

  Proposed opex for 2019-23 is $57 million ($2018-19), or a three percent **reduction** on IPART's 2014 determination allowances.

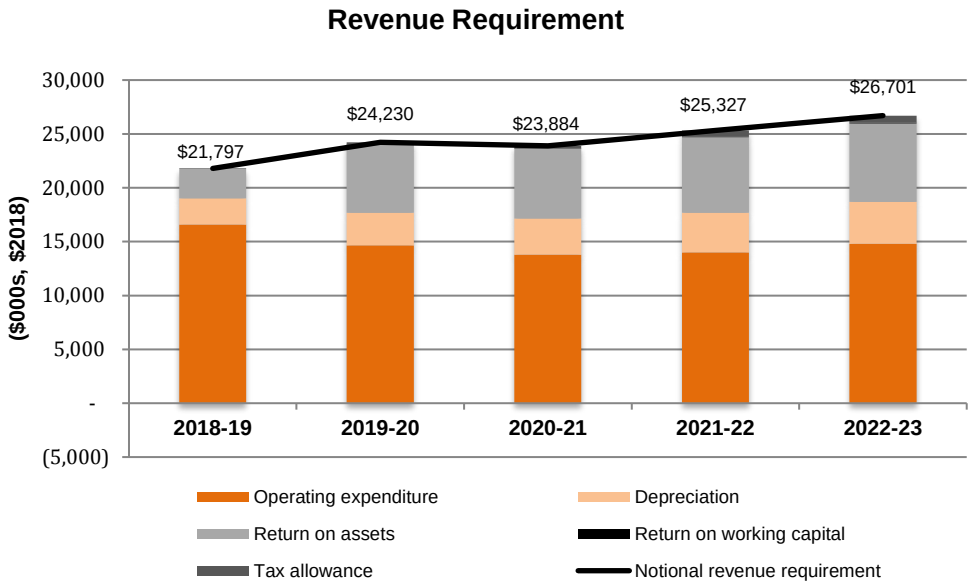
  Our proposed opex has been reduced through a significant efficiency program over the past three years, including a reduction in staff numbers through a hiring freeze and natural attrition, and reductions in overtime, agency staff, fleet, call-outs and travel costs. Operational savings are also forecast due to the planned decommissioning of the Menindee pipeline and the associated pumping stations between Menindee and Stephens Creek.




- **Rate of return** - The return on capital covers the cost of servicing our debt and provides a return to our shareholders for their equity investment in our business. It is calculated by multiplying the value of our regulated asset base by the rate of return – commonly known as the weighted average cost of capital, or WACC.

Our proposed rate of return for the 2019-23 regulatory period reduces from 4.5 per cent to 4.0 per cent over the period based on IPART's post-tax real framework. This is well below our current allowed rate of return of 5.2 per cent, largely due to lower interest rates since 2014.

- **Revenue requirement** – Our proposed notional ('unsmoothed') revenue requirements (in $2018-19) increase from $24 million in 2019-20 to $27 million in 2022-23, while our target ('smoothed') revenues increase from $23 million to $27 million.




- **Tariff structures** – Our proposed tariffs have been developed to promote pricing efficiency and have been shaped by community feedback.

  *Water tariffs*: We propose to retain the existing water tariff structure. Water usage charges are based on long run marginal cost (LRMC). Our current water usage charge of $1.80 per kilolitre (kL) is adjusted by the average pricing 'X factor' (that is, the annual price change excluding inflation) each year during the 2019-23 period. We also propose to maintain the approach to pricing for mining customers from the 2014 IPART determination.

  *Sewerage tariffs*: We propose to retain the existing sewerage tariff structure and adjust our current sewerage usage charge of $1.28 per kL by the average X factor each year.

  While our proposed prices are consistent with IPART's 2014 determination, we do not support IPART's approach to pricing for 'exempt' customers (as defined under the NSW *Water Management Act 2000*). We seek the opportunity to work with IPART to resolve this matter through the existing pricing arrangements or through the introduction of cost-reflective tariffs for exempt customers.

- **Bill impacts** – A typical residential customer consuming 200 kL of water per year would see an average annual increase in their combined water and sewerage bill of 9.1 per cent (6.4 per cent excluding inflation) or $127 per year.

  A typical non-residential customer consuming 2,100 kL of water per year would see an average annual increase in their combined water and sewerage bill of 9.0 per cent (6.3 per cent excluding inflation), or $1,039 per year.

# 2 INTRODUCTION

This chapter provides the relevant context to the Essential Water submission to the Independent Pricing and Regulatory Tribunal of NSW (IPART) for pricing for water and sewerage services for the Broken Hill region for the regulatory period starting 1 July 2019.

## 2.1 Background

Essential Water provides water and sewerage services to the communities of Broken Hill, Menindee, Sunset Strip and Silverton. We are responsible for providing water reticulation, town water system management and water treatment and wastewater management to these communities.

Potable (treated) water is treated to a high standard at Essential Water's three water treatment plants. The water is then stored in one of twelve local storage tanks in the region before being distributed to approximately 10,500 customers via a network consisting of 220 kilometres of reticulation mains pipelines.

Prior to arriving at a customer's tap, water goes through a number of stages.

Initially, it is collected through river catchments and is pumped via one of nine pumping stations to our dams and storage facilities before it is transferred for treatment at one of our water treatment plants.

After treatment, water is then sent to urban water service reservoirs before being distributed via pumping stations and water mains to customers.

From 2019, the primary source of water will be the new Wentworth to Broken Hill pipeline. This new pipeline is being constructed by its owner, WaterNSW, and is expected to be fully operational by April 2019. Water will also continue to be sourced from Stephens Creek reservoir and Umberumberka reservoir. We will decommission the reservoir at Imperial Lake, as the costs of ensuring ongoing compliance with legislated safety requirements are uneconomic for the community.

Wastewater makes its way from homes and businesses through a network of 228 kilometres of pipes to a facility where it is treated and discharged back into the environment. Some sewage is extracted from the network and treated for reuse in irrigation and other non-potable applications.

Widespread monitoring of the key steps in the process and maintenance of relevant facilities is required to ensure public health, environmental, safety and reliability targets and compliance obligations are met.

Asset investment, replacement and maintenance activities are planned well in advance, and evaluated and implemented to meet community demands and rigorous environmental obligations. Asset management and investment programs must be designed to ensure the best use of current resources, including demand management and conservation when demand cannot be met from existing supply.

Essential Water is responsible for ensuring that these services are provided to the community efficiently and in compliance with all regulations.

## 2.2 Our 2019-23 pricing proposal

The prices charged by Essential Water for the provision of water and sewerage services to Broken Hill and surrounding communities are regulated by IPART under NSW legislation, the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act). IPART's current determination commenced on 1 July 2014 for a four-year regulatory period that was due to expire on 30 June 2018. Given the uncertainty around the future bulk water supply arrangements for the community and the impact this might have on water prices, the four-year determination was extended by an additional year to 30 June 2019. Prices for 2018-19 will be maintained at 2017-18 levels.

On 13 December 2016, the NSW Minister for Energy signed terms of reference under the IPART Act for an investigation into, and the making of a price direction for, regulated water and sewerage services provided by Essential Water for the period commencing 1 July 2019.

On 22 December 2017, IPART provided Essential Water with a set of submission guidelines and instructions to facilitate the smooth production, review and approval of the 2019 submission. Under the guidelines, Essential Water is required to produce a pricing proposal and supporting documents,

detailing and justifying its capital and operational expenditure plans, revenue requirements and pricing for the regulatory period commencing 1 July 2019.

Essential Water's 2019–23 water and sewerage pricing proposal (2019-23 submission) comprises a user-friendly, 'plain English' overview document, twelve detailed chapters that cover the standard elements of a regulatory pricing proposal and detailed attachments. Our submission also includes a completed revenue model that is provided to IPART on a confidential basis as it contains potentially sensitive information on some of our large customers, as well as completed IPART-issued information templates and approval documents.

Essential Water has engaged with our customers and stakeholders to help inform our decision-making and the content of our regulatory proposal. To make the proposal more accessible to the community, Essential Water has developed a user-friendly and customer-focused website: (https://engage.essentialenergy.com.au/essential-water-ipart-submission).

The website provides an interactive way for our customers to better understand and explore the key parts of the proposal. It also provides access to the overview, attachments and models.

# 3 WHO WE ARE

Essential Water provides water services to a population of approximately 18,000 people in Broken Hill, Menindee, Sunset Strip and Silverton. We also provide sewerage and trade waste services to customers in Broken Hill. Essential Water has approximately 10,500 water customers and 9,700 sewerage customers.

## 3.1 Brief history of water supply in Broken Hill

In 1883, a rich mineral deposit (silver, lead and zinc) was discovered in the area now known as the city of Broken Hill. During the first 69 years of its life, Broken Hill was affected by water shortages. Permanent natural waterholes were almost non-existent, local water courses only ran for short periods after rain and shallow depressions holding water dried up quickly through soakage and evaporation.

Construction of the Stephens Creek Reservoir was completed in 1891 and provided water to the city in 1892. It remains in place today. However, this storage did not meet the water demands of the community and mining industry. An additional reservoir at Umberumberka was completed in 1914, enabling water to be pumped to Broken Hill, approximately 28 kilometres away. It was not until completion of the Menindee Lakes to Broken Hill pipeline in 1952 that Broken Hill was provided with a more reliable water source.

The then NSW Water Conservation and Irrigation Commission constructed a series of weirs, regulators and banks on the lakes in the 1950s and 1960s to form the 'Menindee Lakes Storage Scheme'. A dam on the Darling River at the inflow to Lake Pamamaroo forms the artificial Lake Wetherell under high water conditions. The purpose of the scheme was to store and conserve water for domestic, stock and irrigation water supply, including water storage for South Australia. In 1958, Weir 32 on the Darling River at Menindee was completed, and the entire Menindee Lakes storage project was opened in November 1960.

More detail on the history of water supply in Broken Hill is provided in Appendix 2.

As discussed in Section 4, new bulk water supply arrangements will be in place from 2019, with water sourced from Wentworth to Broken Hill via the new Wentworth to Broken Hill pipeline.

## 3.2 Our objectives

Essential Water operates its water supply functions under the *Water Management Act 2000* and the *Water Management (General) Regulation 2011*.

Essential Water's objectives are to:

- provide safe and reliable drinking water in accordance with the Australian Drinking Water Guidelines,

- provide water and sewerage services that meet customers' needs for reliability, quality, environmental protection and performance,
- maintain a water and sewerage system that is safe for the community, customers and employees,
- provide a service for the discharge of trade waste,
- provide a high level of customer service,
- minimise costs to Essential Water and the consequential impacts on customer prices, and
- provide a reasonable return to our shareholder.

## 3.3 Our services

Essential Water's primary purpose is to provide water supply, sewerage, liquid trade waste and related services to its customers.

We supply treated water to Broken Hill and Menindee, and chlorinated (but unfiltered) water to Sunset Strip and Silverton. Essential Water supplies a total of approximately 5 gigalitres (GL), or 5 million kilolitres (kL), of water per year to around 9,600 residential customers and around 900 non-residential customers. Essential Water also provides non-potable water to 46 rural users along the Menindee to Broken Hill pipeline for stock and domestic purposes.

The largest single customer is the mining company, Perilya Ltd (Perilya). Broken Hill Operations, a second mine, also operates close to Broken Hill. The two mining companies collectively account for approximately one-third of our customers' total water consumption.

Essential Water also 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.

The prices charged by Essential Water for the provision of water and sewerage services to Broken Hill and surrounding communities are regulated by IPART.

More detail of the services provided by Essential Water can be found in Chapter 3 'Service standards'.

## 3.4 Our customers

### Customer demographics

Based on 2016 census data collected by the Australian Bureau of Statistics (ABS), the following is a snapshot of the population of Broken Hill:[1]

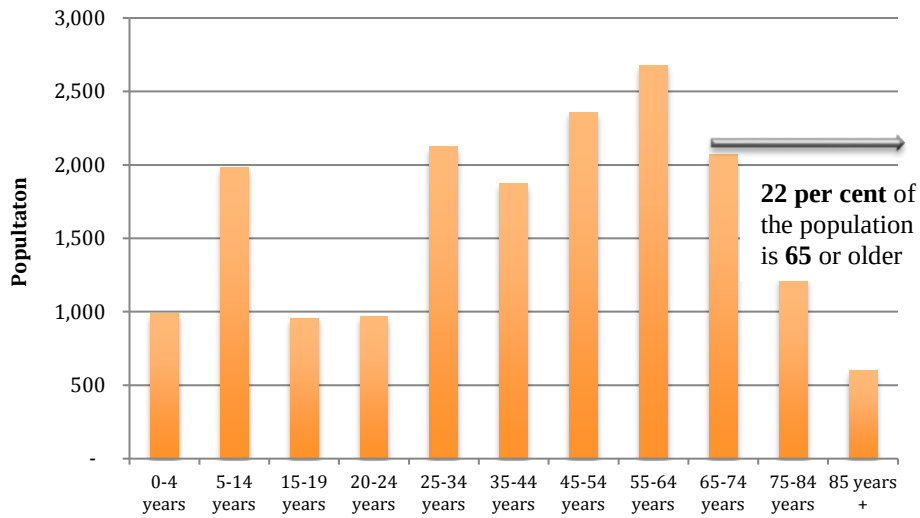
[1] Australian Bureau of Statistics 2016 Census of Population and Housing – Broken Hill (SSC 10592).

**Table 1-2: Summary of 2016 census data**

| 2016 census | Result |
|---|---|
| Population | 17,814 |
| Male | 49 per cent |
| Female | 51 per cent |
| Aboriginal and or Torres Strait Islander people | 8.4 per cent |
| Median age | 45 |
| Families | 4,568 |
| Average children per family:<br>* for families with children<br>* for all families | <br>1.8<br>0.6 |
| All private dwellings | 9,654 |
| Average people per household | 2.2 |
| Median monthly mortgage payment | $953 |
| Median weekly rent | $189 |
| Average motor vehicles per dwelling | 1.5 |

Source: 2016 census data.

**Figure 1-1: Age profile of the Broken Hill population**

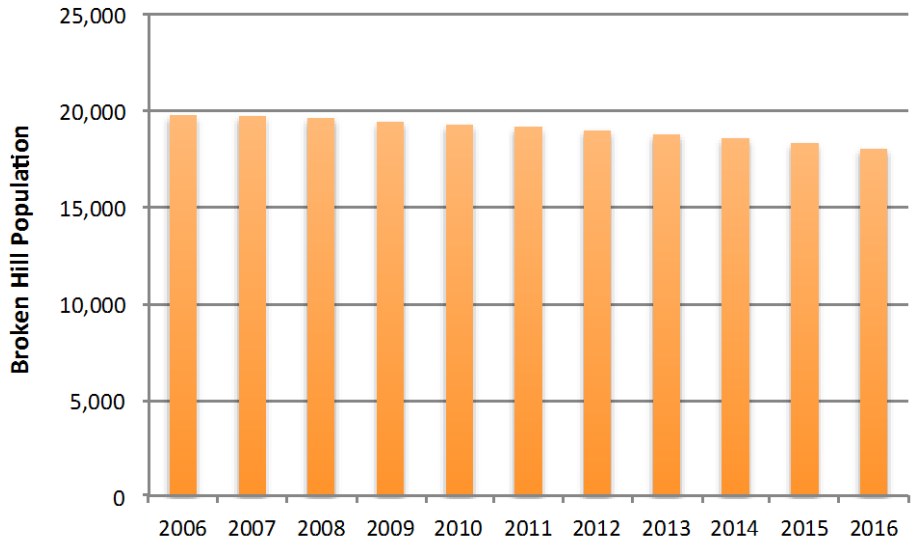



Source: 2016 ABS Census data

Approximately 22 per cent of the Broken Hill population is aged 65 years or older. This is considerably higher than the State average of 16.3 per cent and the national average of 15.7 per cent, indicating that the population in Broken Hill is older than in other parts of NSW and Australia and with a greater proportion on fixed incomes.

The population in Broken Hill has decreased by one per cent on average each year over the past decade as highlighted in the following figure:

**Figure 1-2: Population of Broken Hill 2006-2016**




Source: Australian Bureau of Statistics, Regional Population Growth, Australia (3218.0)

If this trend continues, it would result in a population of 15,014 in 2036. This is not inconsistent with, although less pessimistic than, the forecasts from a 2013 Local Government Review[2] that suggested that the projected population for Broken Hill in 2036 is 13,700.

A useful way to assess the relative level of social and economic wellbeing of a region is to examine a socio-economic index, as discussed below.

### Socio-Economic Indexes for Areas

Socio-Economic Indexes for Areas (SEIFA) is an ABS product that ranks areas in Australia according to relative socio-economic advantage and disadvantage. The indexes are based on information from the five-yearly Census of Population and Housing. SEIFA uses a broad definition of relative socio-economic disadvantage in terms of people's access to material and social resources and their ability to participate in society.[3]

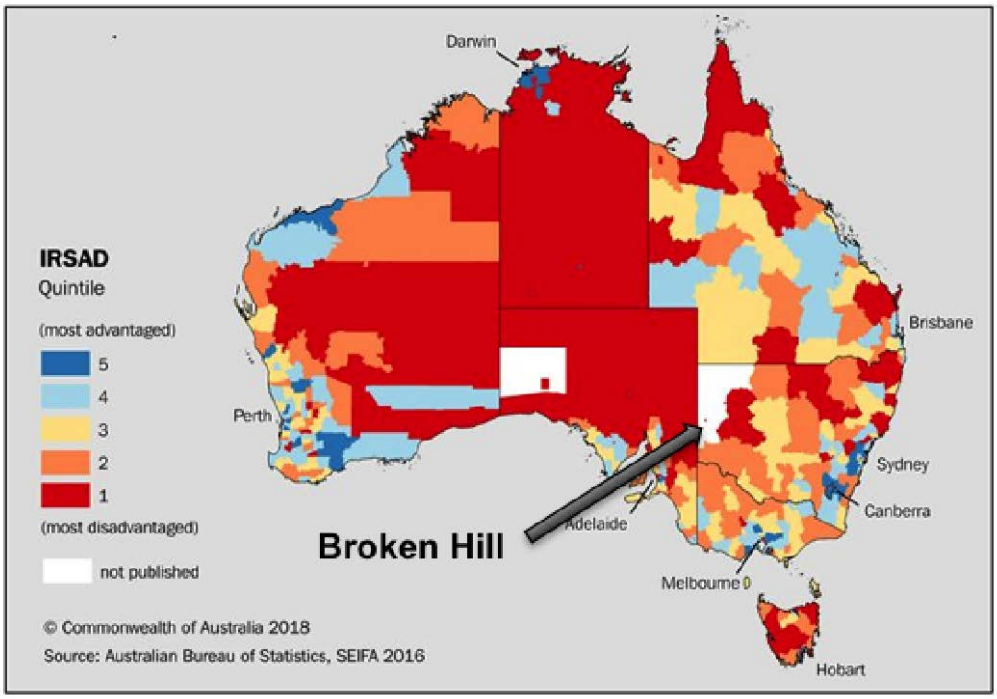
SEIFA is a set of four indexes, which rank geographical areas across Australia. These indexes are ranked by a score based on the characteristics of the people, families and dwellings in these areas. This can be used to determine where the wealthy, the disadvantaged, the highly skilled and educated live.

Each index contains a different set of socio-economic information and is available down to a Statistical Area Level 1 (SA1). The 'scoring' for the SEIFA index is relative to the Australian average of 1000, with regions showing a higher level of social and economic wellbeing of a region showing a score of more than 1000, with a score of less than 1000 for regions with lower wellbeing than the national average.

[2] Strengthening NSW Remote Communities Report – April 2013

[3] See ABS Technical Paper Socio-Economic Indexes for Areas (SEIFA) 2016 2033.0.55.001

**Figure 1-3: Index of Relative Socio-Economic Disadvantage in NSW**




The Australian Bureau of Statistics (ABS) Local Government Area Index of Relative Socio-economic Disadvantage for Broken Hill in 2016 shows that Broken Hill has a relatively greater disadvantage than many other local government areas in Australia. In the decile range of one to ten, where one represents the most disadvantaged and 10 represents a relative lack of disadvantage, Broken Hill recorded a score of 902, which placed it in the **lowest decile** in Australia (ranking 1,303 out of 13,691 State suburbs) and NSW (ranking 372 out of 4112 State suburbs), or one of the most disadvantaged.

These statistics suggest that, on average, social and economic wellbeing in the Broken Hill region is well below that of NSW and the nation as a whole. This also indicates that addressing affordability and the impacts on disadvantaged customers will continue to be a significant issue for the region.

### Customer numbers

Of our total of 10,516 water customers[4], the allocation across the various services we provide is illustrated below:

**Figure 1-4: Water Customers by service**

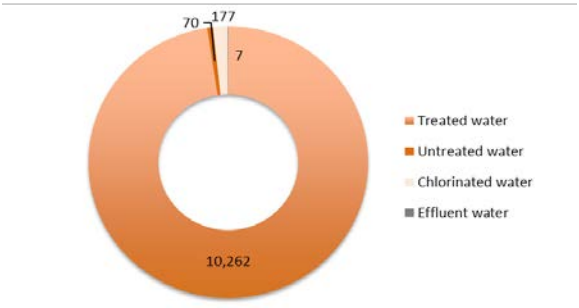
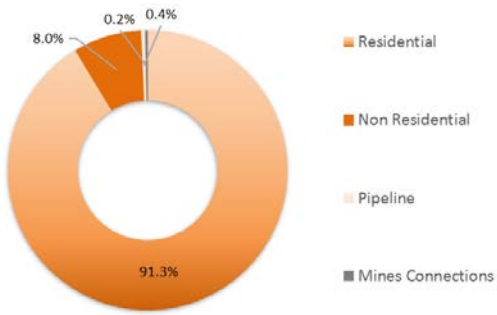



**Figure 1-5: Water Customers by type**

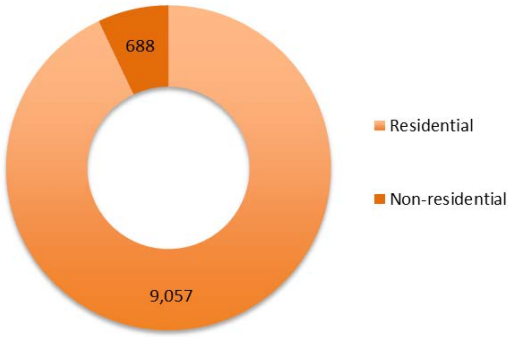



[4] Based on counting customers who receive two different water services, as two customers.

As illustrated in Figure 1-4, approximately 98 per cent of our customers receive treated water, with untreated water and chlorinated water customers representing 0.7 per cent and 1.7 per cent of the customer base, respectively. Figure 1-5 illustrates that residential customers make up approximately 91 per cent of our water customers, with non-residential customers and pipeline customers representing 8 per cent and approximately 0.4 per cent of our water customers, respectively.

Of our total of 9,745 sewerage customers, the breakdown between residential and non-residential customers is illustrated in Figure 1-6 below.

**Figure 1-6: Sewerage Customers by type**




Residential customers represent 93 per cent of our sewerage customers, and non-residential customers represent the remaining seven per cent.

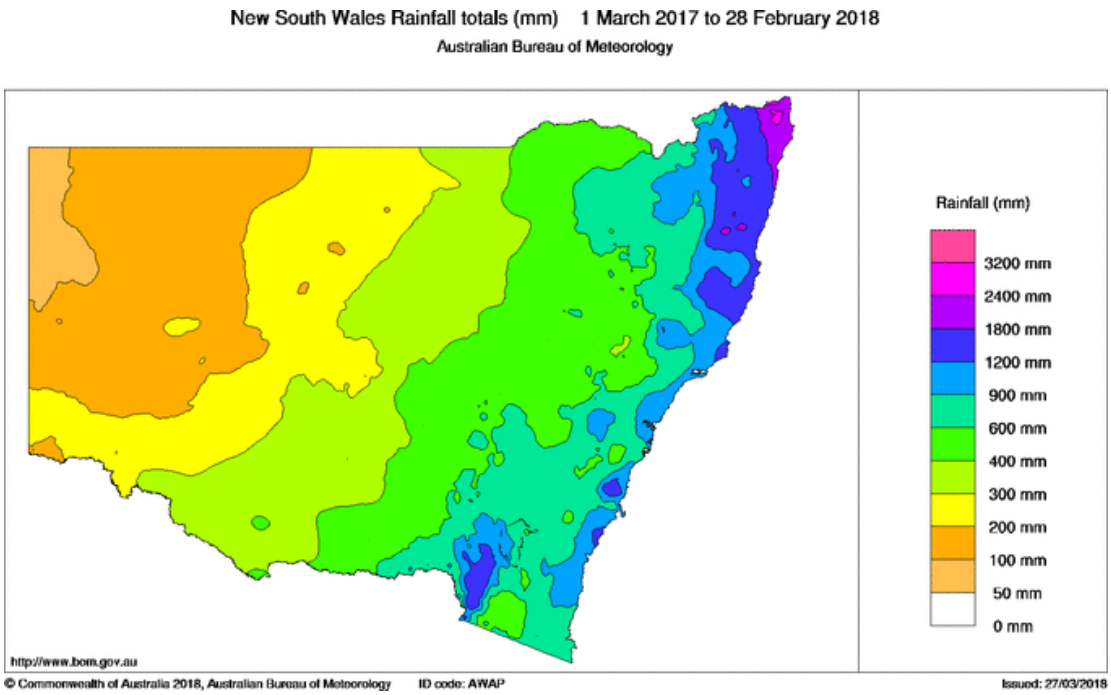
## 3.5 Our environment

Essential Water's service area is the most arid in the State and experiences extreme climatic variations, including frequent droughts.

Historically, eight years in every ten, Broken Hill's water supply has been dependent on water sourced from the Darling River and pumped through 116 kilometres of pipeline to Broken Hill's main storage dam, Stephens Creek. These unique operational circumstances, combined with drought conditions, caused salinity and other water quality problems in the raw water that Essential Water treats.

Figure 1-7 from the Australian Bureau of Meteorology (BOM) illustrates that, over the 12 months to 28 February 2018, rainfall in the Broken Hill region was less than 200 millimetres.

**Figure 1-7: NSW rainfall over the past 12 months**




Source: Australian Bureau of Meteorology

This is consistent with longer term rainfall statistics as illustrated in the following figures and tables:

**Figure 1-8: NSW rainfall over the longer term**

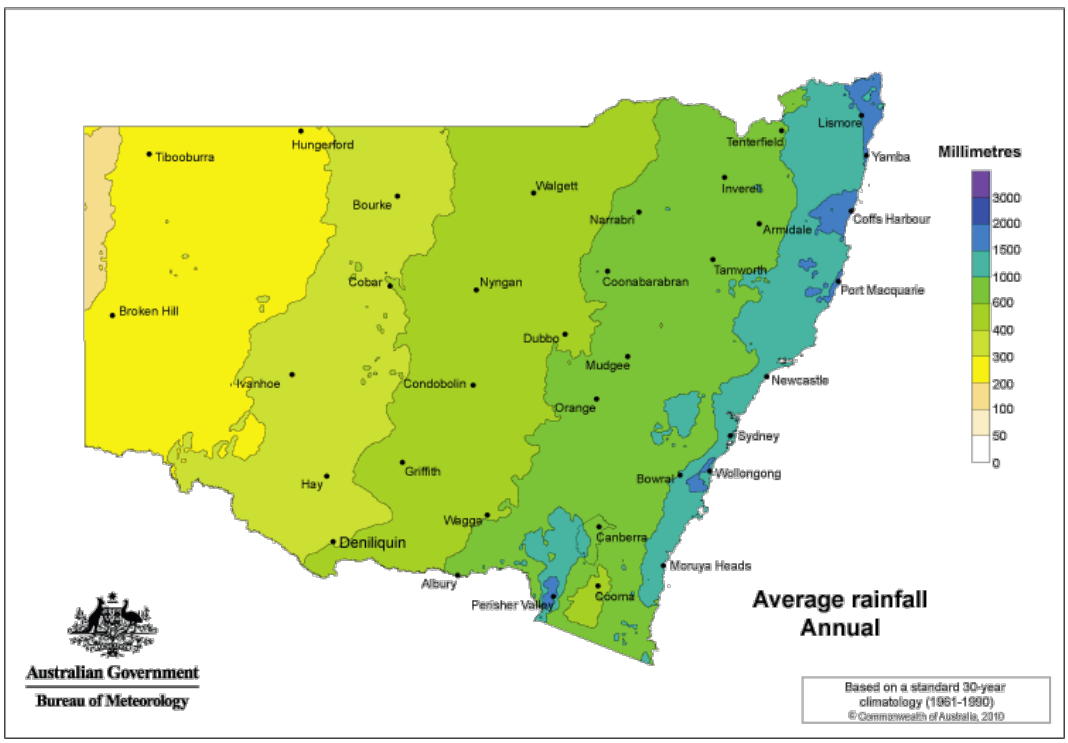
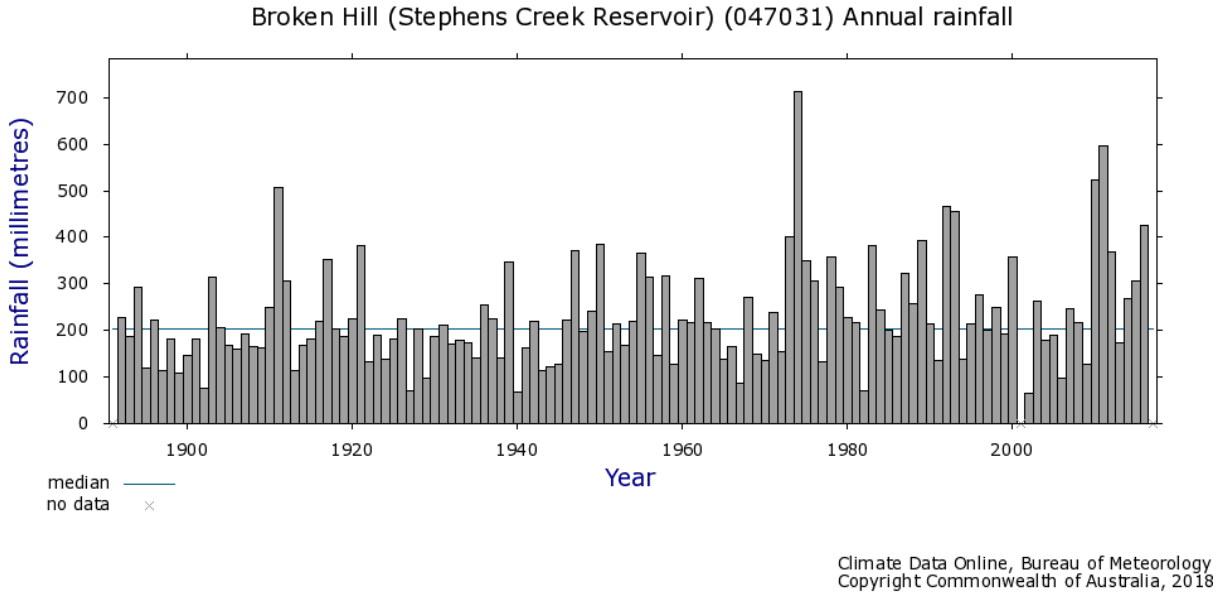


**Figure 1- 9: Broken Hill rainfall over the past 100 years**




Source: Australian Bureau of Meteorology

**Table 1-3: Rainfall summary statistics for all years (1891 to 2017)**

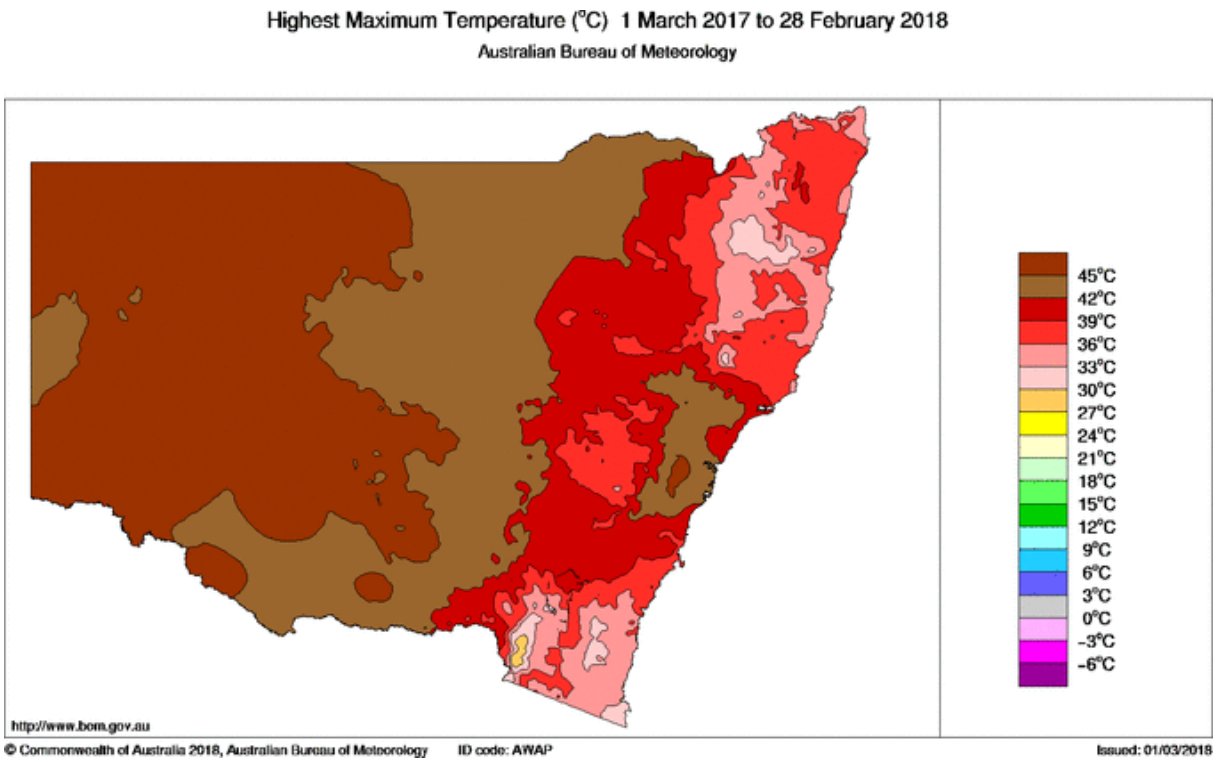
| Statistic | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean | 22.1 | 23.4 | 16.6 | 15.8 | 19.8 | 17.8 | 15.4 | 15.6 | 17.2 | 20.9 | 20.2 | 22.6 | 228.8 |
| Lowest | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 65.3 |
| 5th per centile | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 98.8 |
| 10th per centile | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 1.6 | 1.0 | 1.2 | 1.4 | 1.2 | 0.2 | 0.0 | 120.0 |
| Median | 7.8 | 9.4 | 6.6 | 6.4 | 10.6 | 12.4 | 11.2 | 11.9 | 9.6 | 14.4 | 12.2 | 10.8 | 204.4 |
| 90th per centile | 70.4 | 67.7 | 47.7 | 41.3 | 56.6 | 39.6 | 38.9 | 35.9 | 40.6 | 46.3 | 53.8 | 56.2 | 370.2 |
| 95th per centile | 91.3 | 111.6 | 63.5 | 56.0 | 66.6 | 49.9 | 43.6 | 43.8 | 52.6 | 72.0 | 64.5 | 99.6 | 421.3 |
| Highest | 177.8 | 146.0 | 199.2 | 190.6 | 97.6 | 107.2 | 70.0 | 59.6 | 132.0 | 97.4 | 109.8 | 190.1 | 712.3 |

Source: Australian Bureau of Meteorology (data sourced on 28 March 2018)

As illustrated above, over the past 126 years the median annual rainfall in Broken Hill is 204 millimetres, which is one of the lowest in NSW, with rainfall ranging from a low of 65 millimetres in 2002 to a high of 712 millimetres in 1974.

The following figure highlights the extreme temperatures experienced in the region, with maximum temperatures around 45 degrees Celsius.

**Figure 1-10: Maximum temperatures**




Source: Australian Bureau of Meteorology

When combined with low annual rainfall and extreme temperatures, it is not surprising that the region recently experienced the longest drought on record – one of three that the region has experienced over the last 15 years.

These climatic conditions make supplying water to the region a challenge, but one that Essential Water, with the support of the NSW Government and the new Wentworth to Broken Hill pipeline, is well placed to address.

## 3.6 Our operations

The following sections outline Essential Water's water and sewerage operations.

### Water supply operations

Essential Water is an end water user and is licensed to extract 9.975GL of water per year from the Menindee Lakes Scheme on the Darling River. The Menindee pipeline was originally built in 1952 and requires frequent patching and / or replacement of sections to maintain reliability of supply. These water supply arrangements will change following commissioning of the Wentworth to Broken Hill pipeline.

There are three main storage dams supplying Broken Hill, all managed by Essential Water:

- Stephens Creek - capacity 19,000ML. This dam was originally constructed in the 1890s and has had some upgrades over the years. It receives water from its own catchment, as well as water pumped in from the Darling River via the Menindee pipeline, which was constructed in the early 1950s.
- Umberumberka Dam - capacity 7,800ML. This dam was constructed in 1914 and is a relatively deep and efficient storage facility, but with a reduced storage capacity due to the build-up of silt over the years. Umberumberka can only meet approximately 60 per cent of Broken Hill's daily water requirements due to the limited capacity of the pipeline between it and the Mica Street water treatment plant. Umberumberka only receives water from its own catchment and is frequently dry and, therefore, not a reliable water source.

- Imperial Lake (emergency water supply) - capacity 670ML. This dam was constructed in 1888 and collects water from its own catchment, including part of the Broken Hill urban area.

These dams act as storage for water from rainfall over the local catchment area. Stephens Creek also acts as a terminal storage for water from the Menindee Lakes Scheme before it is pumped to the Mica Street water treatment plant.

Stephens Creek is moving towards full compliance with NSW Dam Safety Committee (DSC) guidelines and requires extensive capital works in order to comply.

Essential Water plans to decommission Imperial Lake dam during the upcoming regulatory period as the costs of ensuring ongoing compliance with legislative obligations are prohibitive in light of the new bulk water supply arrangements.

The Mica Street water treatment plant was rebuilt between 2009 and 2011 at a total cost of almost $40 million. This is the only water treatment plant in Broken Hill and although relatively new, still requires ongoing maintenance and repairs.

Treated water is stored in a number of service reservoir tanks strategically located in and around Broken Hill. These tanks are of steel or concrete construction and require maintenance periodically to prevent corrosion and degradation and maintain water supply reliability and quality.

The Broken Hill water reticulation system was originally built over a 30-year period commencing 1937 and comprises 220 kilometres of pipework of various diameters and ages. Due to aging and resulting condition, sections of the reticulation system now require replacement.

Figure 1-11 below provides a schematic diagram of the water supply network supplying Broken Hill and surrounding areas.

**Figure 1-11: Water supply network diagram for Broken Hill supply area**

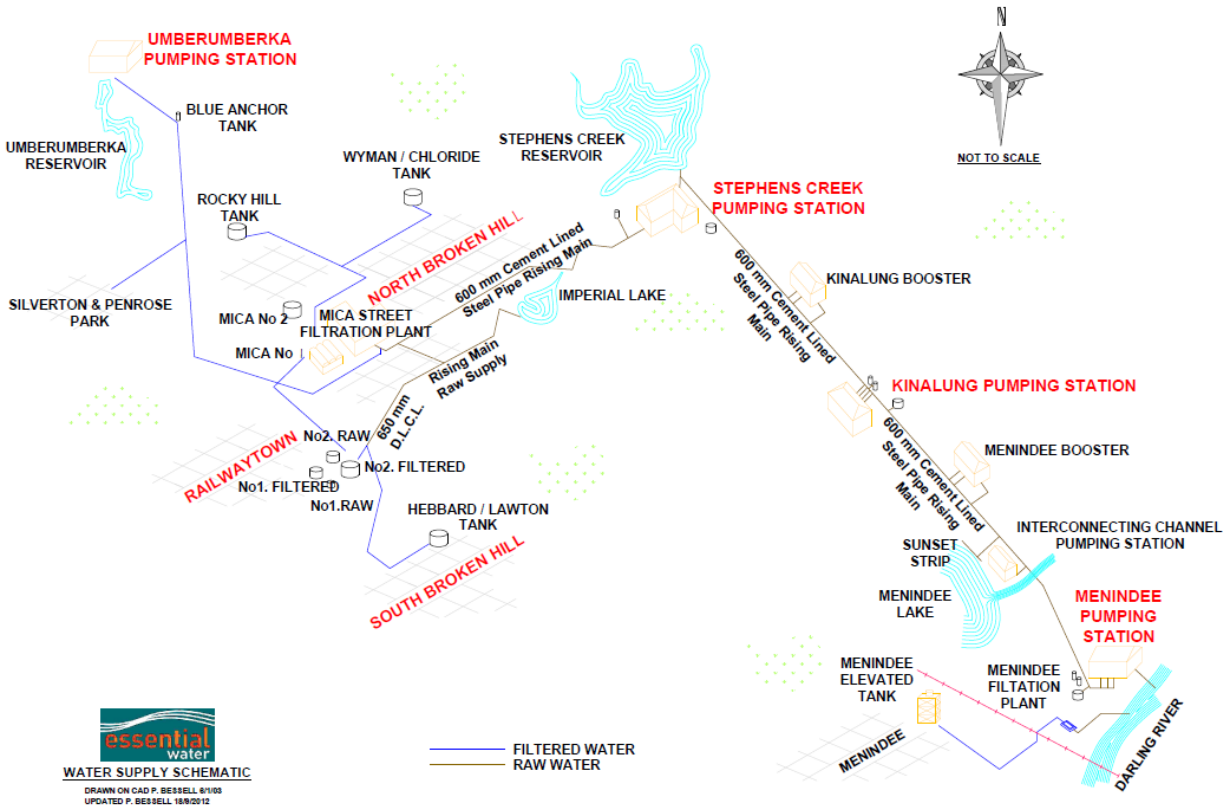


Table 1-4 lists Essential Water's major water assets.

**Table 1-4: Essential Water major water assets**

| | |
|---|---|
| ***Three dams***<br>▪ Stephens Creek (19 GL)<br>▪ Umberumberka (7.8 GL)<br>▪ Imperial Lake (0.7 GL) | ***Three water treatment plants***<br>▪ Mica St<br>▪ Menindee<br>▪ Sunset Strip |
| ***Four bulk supply pipelines – 167 kilometres***<br>▪ Menindee – Stephens Creek (116 kilometres)<br>▪ Stephens Creek – Broken Hill (16 kilometres)<br>▪ Imperial Lake - Broken Hill (5 kilometres)<br>▪ Umberumberka - Broken Hill (30 kilometres) | ***Three balance tanks***<br>***12 service reservoirs***<br>***Booster and pressure pumps***<br>***Approximately 10,600 customer water meters*** |
| ***Silverton water chlorinator*** | ***220 kilometres of reticulation mains*** |
| ***Nine pumping stations*** | ***156 kilometres of headworks transfer length*** |

New bulk water supply arrangements will occur in Broken Hill from early-mid 2019. These new arrangements are discussed in section 4 of this chapter, with the proposed regulatory treatment discussed in Chapter 2 'Form of Regulation'.

More information on the history of water in the Broken Hill area is provided in Appendix 2.

### Sewerage operations

Essential Water has two wastewater treatment plants in Broken Hill – the Wills Street and South Broken Hill wastewater treatment plants.

The Wills Street wastewater treatment plant was constructed in 1940 and augmented in 1957. By 1961, 91 per cent of Broken Hill had sewerage available and 71 per cent of premises were connected. The main part of the city was connected by 1962. The Wills Street wastewater treatment plant was further upgraded in the 1980s, but is now approaching the end of its serviceable life and requires replacement.

Essential Water is proposing to replace the Wills Street wastewater treatment plant during the upcoming regulatory period. This project forms the single largest investment in our proposed capital expenditure program (approximately $34 million). This critical project needs to be undertaken during the 2019-23 period to ensure we comply with our environmental obligations. Further delays are not sustainable. Our proposed capital expenditure program is discussed in Chapter 7 'Capital expenditure' of this submission.

The South Broken Hill treatment plant was operational by the end of 1962, making sewerage services available to 29 per cent of houses in that area, with associated works completed in 1964. Minimal upgrades and renewal have been carried out since the system was commissioned.

There are 228 kilometres of gravitational sewerage reticulation mains in Broken Hill, of varying age and condition. Some of this reticulation system requires maintenance, mainly in the form of being relined, in order to maintain system integrity. The major sewer assets are summarised in Table 1-5.

**Table 1-5: Essential Water major sewerage assets**

| | |
|---|---|
| ***228 kilometres reticulation mains*** | ***3,400 man holes*** |
| ***20 kilometres sewer rising mains*** | ***11 sewerage pumping stations with associated equipment*** |
| ***Two wastewater treatment plants***<br>▪ Wills Street<br>▪ South Broken Hill | ***11 kilometres treated effluent mains*** |

## 3.7 Our legislative framework

The legislative framework that applies to the provision of services offered by Essential Water is outlined in Chapter 3 'Service Standards'. Our primary regulators and their responsibilities are:

- IPART

  Responsible for setting the maximum prices that can be charged by Essential Water for its regulated services.

- The NSW Department of Primary Industries (DPI)

  Primarily responsible for the management of water resources throughout NSW. Through the Dams Safety Committee, the DPI is responsible for formulating measures to ensure the safety of dams.

- NSW Health

  Responsible for regulating the quality and safety of Essential Water's drinking water.

- NSW Office of Environment and Heritage

  Responsible for monitoring and regulating sewage discharges from Essential Water's sewerage system.

Legislation that applies to Essential Water's services includes:

- Water Management Act 2000,
- Water Management (General) Regulation 2011,
- Dam Safety Act 1978,
- Protection of the Environment Operations Act 1978,
- Fluoridation of the Water Supplies Act 1957,
- Environmental Planning and Assessment Act 1979,
- State Environmental Planning Policy (Infrastructure) 2007, and
- Public Health Act 2010 and Public Health Regulation 2012.

These govern the services we provide, which are outlined in Chapter 3 'Service standards'.

# 4 NEW BULK WATER SUPPLY ARRANGEMENTS

Bulk water supply arrangements in Broken Hill are changing for the 2019-23 determination period as a result of the new Wentworth to Broken Hill pipeline being constructed, and to be operated, by WaterNSW.

## 4.1 The Wentworth to Broken Hill pipeline – background

The 270-kilometre Wentworth to Broken Hill pipeline will supply up to 37.4 megalitres a day of raw water to Essential Water in Broken Hill. Essential Water will retain responsibility for water treatment and distribution to customers.

**Figure 1-12: Wentworth to Broken Hill pipeline route**[5]


Raw water will be sourced from the Murray River near Wentworth, with the pipeline being constructed underground and generally following the Silver City Highway corridor to Broken Hill.

WaterNSW has appointed a consortium of John Holland, MPC Group and TRILITY to design, construct, operate and maintain the Wentworth to Broken Hill pipeline, as part of the Government's investment in regional water security.

Construction is targeted for completion in December 2018, with full commissioning expected by April 2019.

Surface infrastructure is expected to include a water intake pump station at Wentworth, two transfer pumping stations, a bulk water pump station together with a photovoltaic power (solar) generation system at the pump station and a bulk water storage dam.[6]

Appendix 1 provides a schematic view of the Wentworth to Broken Hill pipeline route and some key statistics.

### 1..1 Why is the pipeline being built?

The Government acknowledged that Broken Hill, Silverton and its surrounding satellite communities are running out of a secure supply of water. In eight out of ten years, Broken Hill has been reliant on water being pumped from the Menindee Lakes, through the existing pipeline that was built in the early 1950s, which is now in poor condition and approaching the end of its serviceable life. In May 2015, a short-term (emergency) water solution for the Broken Hill region was implemented in response to dwindling water supply and declining water quality. This included a Reverse Osmosis Treatment Plant to treat surface water and bore field development.

In the absence of significant inflows, the short-term measures were expected to have exhausted all available surface water and ground water supply options by April 2019.

[5] WaterNSW February 2018 Community Update https://www.waternsw.com.au/__data/assets/pdf_file/0008/130895/Community-Update-Wentworth-February-2018.pdf

[6] See the following link for more information: http://www.waternsw.com.au/projects/murray-to-broken-hill-pipeline

In order to meet the Government's stated objective of no population displacement, and to ensure the long-term sustainability of Broken Hill, residents and industry needed a reliable water supply that meets quality standards and gives the community confidence.

To address this, NSW Department of Primary Industries (DPI Water) initiated a project to provide a secure, long-term water supply solution for Broken Hill and Silverton.

At the time of writing, Far West NSW was experiencing the longest drought on record. The drought was one of three that the Darling River catchment, including Broken Hill, has experienced over the last 15 years. The frequency and severity of droughts experienced recently is only comparable to the early 1900s.

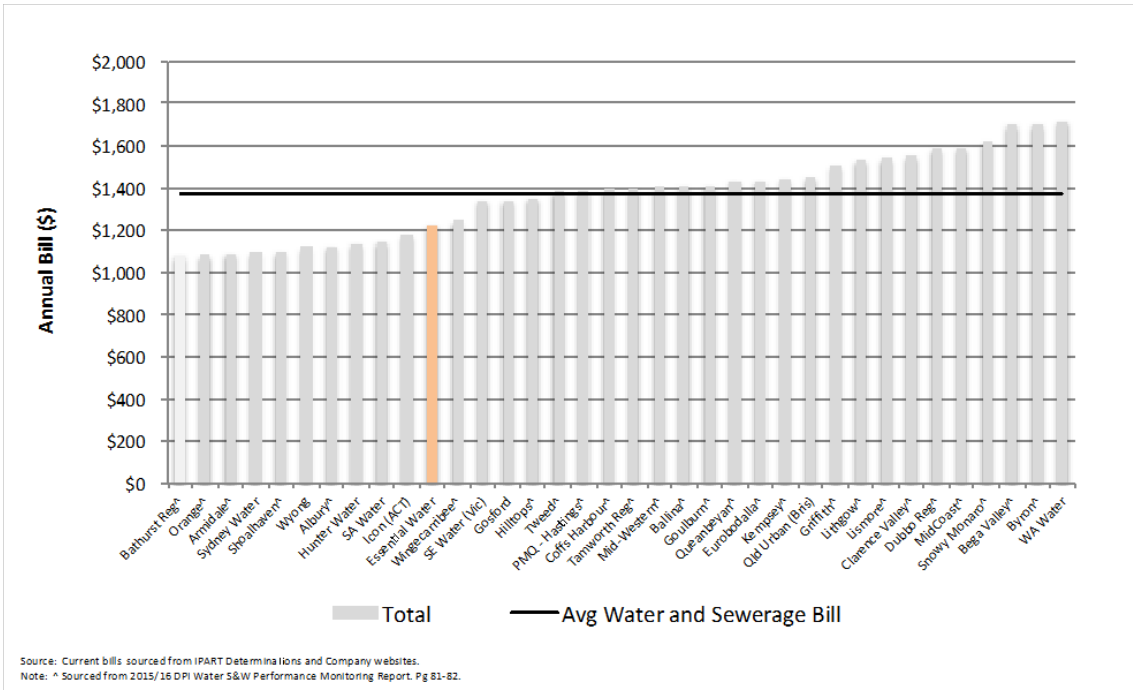
The following section examines the level of customers' bills and assesses how Essential Water's bills compare with other NSW and Australian water utilities.

# 5 HOW OUR BILLS COMPARE

In providing water and wastewater services to Broken Hill and surrounding communities, we strive to ensure that our customers receive value for money and that we provide a safe, quality water supply at an affordable price.

The following chart illustrates how Essential Water's bills compare with other water providers in NSW and Australia. This information is based on internal analysis with information sourced from company websites and the 2015-16 DPI Sewerage & Water Performance Monitoring Report for water utilities with more than 7,000 customers. [7]

**Figure 1-13: How Essential Water's bills compare to other water utilities**




Source: Current bills sourced from IPART Determinations and Company websites.
Note: ^ Sourced from 2015/16 DPI Water S&W Performance Monitoring Report. Pg 81-82.

[7] Assumes water usage of 200kL for Essential Water, Sydney Water, Hunter Water and Gosford Council, Wyong Council and interstate water utilities. Other NSW water businesses are based on the data contained in the 2015/16 DPI Water S&W Performance Monitoring Report.

As illustrated in Figure 1-13, the average water and sewerage bill for 36 water utilities examined in NSW and in other states and territories is $1,369. Essential Water's bill of $1,223 is well below this average. In this benchmarking analysis, Essential Water's combined water and sewerage bill ranked **11th out of the 36** water utilities examined, placing us in the lowest third of bill outcomes.

While bill benchmarking is only one tool to assess issues of affordability, it does highlight that Essential Water's bills are lower than the average water bill within NSW and when examining other water utilities in Australia.

The challenge is to continue to address customer affordability while also meeting our service standard obligations and providing a commercial rate of return to our shareholder, the NSW Government.

# Chapter 2 – Form of Regulation

# 1 SUMMARY

The form of regulation describes the framework that IPART applies to determine and adjust the revenue that Essential Water can earn and/or the prices it can charge over the course of a regulatory period. The form of regulation comprises the following elements:

- the length of the regulatory period,
- the method of determining efficient costs (and therefore allowed revenues) – the 'building block approach' is commonly applied,
- the form of price control – the price cap, revenue cap or hybrid mechanism that controls the utility's prices for each year of the regulatory period and how annual prices may be adjusted,
- volume adjustments – such as 'unders and overs' accounts or a volume adjustment mechanism to deal with deviations between forecast and actual revenue collection,
- incentive mechanisms – specific features of the framework that provide financial incentives for businesses to achieve targeted outcomes, and
- pass through arrangements – specific mechanisms to share the risk of unexpected events beyond the control of the business.

This chapter sets out Essential Water's proposed form of regulation for the 2019–23 regulatory period.

**Box 2-1: Key points**

Essential Water proposes the following features of a well-functioning regulatory framework:

- a four-year regulatory period starting on 1 July 2019,
- continuation of IPART's building block framework and the use of the 'post-tax real' framework,
- continuation of the current price cap form of price control,
- a demand volatility adjustment mechanism to apply from 1 July 2019 with a ± five per cent materiality threshold to manage significant volume variations from forecasts,
- the addition of a cost pass through mechanism to deal with unexpected, uncontrollable events. A cost pass through mechanism provides an appropriate balance in the allocation of risks between Essential Water (to recover costs to attract sufficient investment in its network) and end customers (to ensure that prices are no more than necessary to provide an appropriate level of service),
- continuation of the inherent incentives in the CPI-X regulatory framework without additional incentive mechanisms, in recognition of the characteristics of the Essential Water business, and
- transparent pricing and funding for the new bulk water supply transportation arrangements.

# 2 FORM OF REGULATION

## 2.1 Introduction

IPART is the principal economic regulator in NSW. Its main functions are set out in the *Independent Pricing and Regulatory Tribunal Act 1992 (NSW)* (the IPART Act). Among other responsibilities, IPART determines the maximum prices to be charged for declared government monopoly services provided by water utilities, including Essential Water.

In setting prices, IPART is required to consider and balance a broad range of matters (see the full list of matters listed in Section 15(1) of the IPART Act at Box 2-2 on the following page) including:

- **Customers**: safety, quality and affordability,
- **Businesses**: efficiency and financial sustainability,
- **The environment**: ecologically sustainable development and operations, and
- **Society**: economic efficiency, planning and social impact.

## 2.2 Current form of regulation

Essential Water is currently subject to the following form of regulation in accordance with IPART's 2014 determination:

- a four-year regulatory period that was subsequently extended to five years in recognition of the uncertainty over future water supply arrangements in the region. The fifth year (2018-19) was a continuation of 2017-18 prices in nominal terms, with no re-forecasting of underlying cost or pricing parameters,
- the cost 'building block' approach to determining allowed revenues using a 'post-tax real' framework,
- a price cap form of control with price caps for all individual water and sewerage services,
- a price path set in advance based on forecast usage and customer numbers with no annual reforecasting,
- an annual price adjustment process for changes in inflation,
- a demand volatility adjustment mechanism to adjust for material changes in revenues from the 2014 regulatory determination as a result of volume changes (triggered at the discretion of IPART), and
- a framework with no cost pass through events, thereby resulting in Essential Water managing all risks on behalf of customers.

Essential Water is proposing a continuation of most of the above elements of the current regulatory framework, with some modifications as discussed in the following sections. In particular, we are proposing a small number of cost pass through events, which are described in Section 5.

**Box 2-2: IPART Act 1992 pricing provisions**

14 - Method of fixing maximum prices

(1) A determination of the Tribunal of the maximum price for a government monopoly service may fix that price in any manner the Tribunal considers appropriate, including the following:

(a) by fixing an average price for a number of categories of the service,

(b) by fixing a percentage increase or decrease in existing prices,

(c) by fixing an average percentage increase or decrease in existing prices for a number of categories of the service,

(d) by fixing a specified price for each category of the service (if any other manner is not considered appropriate).

15 - Matters to be considered by Tribunal under this Act

(1) In making determinations and recommendations under this Act, the Tribunal is to have regard to the following matters (in addition to any other matters the Tribunal 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).

## 2.3 Length of the determination period

One of the decisions that IPART is required to make as part of its upcoming determination for Essential Water is the length of the regulatory period.

In water pricing reviews, IPART makes a decision on the number of years that the maximum prices they set can be levied. The period is to reflect the specific circumstances that apply to a particular utility at the time of the determination.

As outlined in IPART's December 2017 Guidelines for Water Agency Pricing Submissions:

> *You should propose the length of the determination period*
>
> *In general, we consider the following factors when deciding on the length of the determination period:*
>
> - *the confidence we can place in 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 term of the operating licence (where applicable),*
> - *the costs of a price review, and*
> - *the benefits of aligning the determination with the price determination of related utilities.*[8]

The advantages of a longer determination period include stronger incentives for Essential Water to increase efficiency (and retain the benefits of efficiency improvements), greater stability and predictability, and reduced regulatory costs.

The disadvantages include increased risk associated with potential inaccuracies in the data, possible delays in customers benefitting from efficiency gains, and the risk that changes in the industry or the operating environment will affect the appropriateness of the determination. In periods of uncertainty, a shorter determination may be beneficial in reducing the pricing and cost risks.

At the 2014 IPART determination, IPART decided on a four-year determination period to apply from 2014-15 to 2017-18 (later extended to five years to also include 2018-19). Most stakeholders at the 2014 IPART determination supported Essential Water's proposal for a four-year determination period, including the Public Interest Advocacy Centre (PIAC), which agreed that it provides an appropriate balance between providing certainty to the regulated business while limiting delays in customers benefitting from lower water prices. PIAC also submitted that a four-year determination reduces the risk that consumers will pay above the efficient price for a prolonged period.

IPART considered the confidence it could place in Essential Water's forecasts and the advantages and disadvantages of longer or shorter determination periods. After considering these issues, IPART decided on a four-year determination period.

We note that IPART will undertake a separate, concurrent determination to assess the WaterNSW costs of constructing and operating the Wentworth to Broken Hill pipeline. We expect the new pipeline to be operational by April 2019. Given that greater visibility of the costs will be available before IPART finalises its determination, we do not propose a shorter determination period to address the uncertainty surrounding the Wentworth to Broken Hill pipeline. We have instead proposed a pass through event (a 'Wentworth to Broken Hill Pipeline' event) to address the uncertainty surrounding the costs associated with the integration and ongoing operation of the new bulk water supply arrangements.

On balance, we consider that the benefits of a four-year determination period in providing certainty and minimising both regulatory burden and administrative costs outweigh the costs and benefits of moving to a period shorter or longer than four years.

Essential Water therefore proposes a four-year determination period starting on 1 July 2019.

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[8] Contained in IPART letter to CEO on 22 December 2017, Attachment D, page 23.

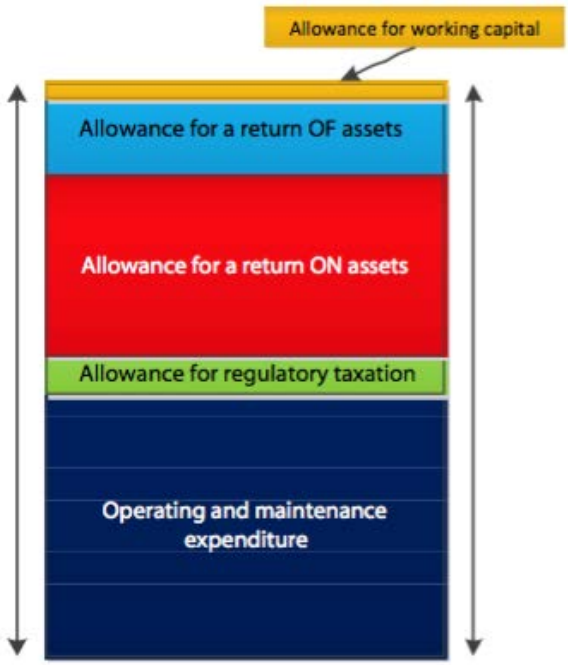
## 2.4 Building block framework

In its 2014 determination for Essential Water's water and sewerage prices, IPART applied the following building block framework to calculate our notional revenue requirement over the determination period. To apply this approach, IPART made decisions on the revenue Essential Water will require in each year of the regulatory period, based on the following building blocks:

- The revenue required for **operating expenditure** over the period. This amount represented IPART's estimate of Essential Water's forecast efficient operating, maintenance and administration costs.
- An allowance for a **return on the assets** used to provide the regulated services. This amount represented IPART's assessment of the opportunity cost of the capital invested in Essential Water by its owner to ensure that it can continue to make efficient investments in capital in the future. The return on capital was calculated by multiplying an indexed regulatory asset base by a rate of return on capital that excluded the impact of inflation, or a 'real' framework, so as to not double count the impact of inflation.
- An allowance for a **return of assets (regulatory depreciation)**. This allowance recognises that through the provision of services to customers, a water utility's capital infrastructure will wear out over time and, therefore, revenue is required to recover the cost of maintaining the regulatory asset base.
- An allowance for meeting **tax obligations**. In determinations prior to 2014, IPART adopted a 'pre-tax' weighted average cost of capital (WACC) in calculating the return on the Regulatory Asset Base (RAB), which effectively 'grossed up' the WACC by the statutory tax rate. For the 2014 determination, IPART adopted a post-tax WACC and calculated Essential Water's tax liability as a separate cost building block as it considered this method more accurately estimates the tax liability for a comparable commercial business.
- An allowance for **working capital**. This allowance represents the holding cost of net current assets.

The sum of the above building blocks represented IPART's view of our total efficient costs over the determination period, or the notional revenue requirement as illustrated in Figure 2-1 below.[9]

**Figure 2-1: IPART building block approach from the 2014 Determination**




[9] IPART Final Report Essential Energy's water and sewerage services in Broken Hill – Final Report June 2014. Pages 36-37.

To promote certainty and transparency in the regulatory framework, we propose that IPART continue to use its current 'CPI-X' post-tax real building block approach to determine Essential Water's required revenues for the 2019–23 regulatory period.

**Approach for converting the notional revenue requirement into prices**

Having calculated Essential Water's notional revenue requirement for the 2014 determination period, IPART then converted the notional revenue requirement into prices. To do this, IPART made a number of decisions, including:

- the target revenue for each year,
- the revenue expected from trade waste, miscellaneous and other sources,
- forecast water sales and customer numbers over the determination period,
- the structure of Essential Energy's prices, and the revenue to be generated from various charges, and
- the level of prices.

Essential Water considers that IPART's approach for converting the notional revenue requirement into prices for the 2014 determination is appropriate, and proposes that the approach be continued for the 2019-23 determination.

The calculation of our proposed notional revenue requirement is provided in Chapter 11 'Revenue requirement', while the derivation of the relevant proposed charges and prices is addressed in Chapter 12 'Tariff structures and price path' of this submission.

# 3 FORM OF CONTROL AND VOLUME ADJUSTMENTS

One of the matters that the Tribunal is required to have regard to when making a determination or recommendation under section 14 of the IPART Act is the approach to calculating the maximum price a water network can charge for its services, as outlined below:

(1) A determination of the Tribunal of the maximum price for a government monopoly service may fix that price in any manner the Tribunal considers appropriate, including the following:

*(a) by fixing an average price for a number of categories of the service,*

*(b) by fixing a percentage increase or decrease in existing prices,*

*(c) by fixing an average percentage increase or decrease in existing prices for a number of categories of the service,*

*(d) by fixing a specified price for each category of the service (if any other manner is not considered appropriate).*

IPART is required to determine a form of regulation for each regulated service (referred to hereafter as a 'form of control') that is a price cap, rather than a revenue cap, which is a common feature of most water regulatory frameworks. The current form of control is a maximum price cap set by IPART at each review that has the ability for prices to be adjusted annually based on parameters set by IPART, such as for changes in inflation.

Common among all price cap forms of control is that the revenues generated (rather than the prices themselves) rise or fall based on actual volumes. Features of price caps include:

- pricing stability for customers is maximised, as prices are largely fixed, with annual movements generally in line with the rate of change in inflation (with provision for other movements, such as cost pass through amounts or adjustments for volume variations),
- profit stability is promoted, as revenues rise or fall as underlying volumes increase or decrease (assuming that costs and volumes are positively correlated),

- revenue instability can occur as prices are fixed, but volumes rise or fall. Volume risk resides with the business,
- pricing efficiency is higher than under a revenue cap as marginal prices can more closely track marginal costs, and
- the annual price change process is relatively straightforward and administratively simple.

Revenue caps, on the other hand, feature:

- revenue stability, as the maximum revenue a business can earn in a year is fixed (subject to annual under or over-recovery adjustments) as revenues are largely independent of actual volumes,
- pricing instability can occur as annual prices change annually to eliminate any under or over-recovery of revenue from the previous year(s) as a result of volume changes. This effectively places volume risk with customers,
- profit instability occurs as revenues do not rise or fall with underlying cost movements,
- pricing efficiency is lower under a revenue cap than under a price cap, as marginal prices are not as closely linked to marginal costs, and
- The annual price change process can be administratively complex in addressing any under or over recoveries, while complying with requirements for pricing efficiency.

## 3.1 Proposed form of control

As the legislative framework does not obviously allow for the introduction of a revenue cap, and the case for change away from the current price cap has not been made, Essential Water proposes that a price cap continues to be the form of control for water and sewerage services for the 2019-23 determination period.

IPART has indicated that it is open to considering alternative forms of regulation and has requested that Essential Water provide our '*preferred or alternative form of regulation, such as a weighted average price cap*' in our submission.[10]

Essential Water considers that the current price cap approach implemented by IPART is fit-for-purpose for the Broken Hill region. Given the small size of the Essential Water business and the resources required to fully develop an alternative to the IPART's current price cap form of control, which would unreasonably raise the costs of providing water and sewerage services for the business and our customers in the Broken Hill region, we do not propose a move away from IPART's price cap approach for the upcoming determination.

There are, however, some concerns with the operation of the existing methodology to address significant variations in volumes under IPART's maximum price cap (i.e. the operation of IPART's 'demand volatility adjustment mechanism') that warrant further consideration. This mechanism is discussed below.

## 3.2 Demand volatility adjustment mechanism

### IPART 2014 determination

In its 2013 submission to IPART for the 2014 determination, Essential Water proposed that a demand volatility adjustment mechanism for all customer consumption be introduced. This mechanism aimed to mitigate possible over or under-recovery due to material variation between the level of actual sales over the determination period and the sales forecast used in making the determination.

[10] IPART letter to CEO on 22 December 2017, Attachment D 'Guidelines for Water Agency Pricing Submissions – Water December 2017'. Page 24.

This is the same mechanism identified in the Sydney Water, Hunter Water, Gosford City Council and Wyong Shire Council reviews undertaken by IPART. The only material difference is that Essential Water proposed that a material variation in sales be defined as a ± 5 per cent change over the determination period (rather than ± 10 per cent change).

While an 'unders and overs' account to manage differences between *ex ante* and *ex post* consumption was proposed by Essential Water as an alternative, IPART instead adopted a demand volatility adjustment mechanism that is similar to the mechanisms it included in the Sydney Water, Hunter Water and Gosford City Council and Wyong Shire Council determinations, with one significant caveat relating to the level of discretion afforded to IPART to determine if the mechanism has been 'triggered'.

IPART stated in its 2014 determination:

> *While we note our decisions now cannot bind a future Tribunal, this demand volatility adjustment could be implemented by comparing the forecast and actual water demand over the 2014 Determination and adjusting the revenue requirement over the next determination period, as decided by the Tribunal at that time.*
>
> *The key difference between the mechanism flagged in previous price reviews and our decision here is that we have not defined a material variation in sales to be ±10 per cent. Due to differences in Essential Energy's customer base, specifically its exposure to a small number of large customers**, we see merit in maintaining greater discretion in relation to if and how any adjustments are made at the next determination**, to account for the magnitude of, and reasons for, any over or under-recovery as a result of sales volatility. [Emphasis added]*
>
> *…*
>
> *Therefore, at this time, we are unable to indicate a preference for a specific means of adjusting prices at the next determination to account for sales volatility over the 2014 determination period.*

IPART further went on to state:

> *At the next [2019] determination of Essential Energy's prices, IPART will consider an adjustment to the revenue requirement and prices to mitigate any over or under-recovery of revenue over this determination period due to material differences between the level of water sales over the determination period and the forecast water sales used in making this determination.*

Therefore, IPART has at the same time:

- flagged that it will consider an adjustment to the revenue requirement for the 2019 determination to mitigate any under or over-recovery from the 2014-19 regulatory period, but
- not specified how or if the adjustment will be triggered.

We consider it important that Essential Water and our customers are provided with a greater degree of certainty about the circumstances in which under or over recoveries, and therefore future revenues and prices, will be assessed.

**Proposed adjustment mechanism for the 2019-23 period**

A demand volatility adjustment mechanism is a useful and important feature of IPART's regulatory framework. However, we consider that IPART's application of the mechanism in Essential Water's 2014 determination contains an unreasonably high level of discretion that does not provide an appropriate level of certainty to Essential Water or its customers on how future revenues and prices are to be calculated.

We consider a more appropriate approach would be for IPART to adopt the mechanism that it applies to Sydney Water and other businesses, whereby a transparent 'materiality threshold', or material variation in sales, is applied.

We note that IPART has recently adopted a demand volatility adjustment with a ± 5 per cent materiality threshold for Sydney Water:[11]

> *21 We have decided to consider at the next determination of Sydney Water's prices:*
>
> – *an adjustment to the revenue requirement and prices to address any over- or under-recovery of revenue over the 2016 determination period due to material variation between the level of actual water sales over the 2016 determination period and the forecast water sales used in making this determination, where:*
>
> *a. a material variation is defined as more than 5 per cent (+ or -) over the whole determination period,*
>
> *b. we would only consider adjusting for variation greater than 5 per cent (+ or -), and*
>
> *c. we will consult as part of the next price review on how the volatility mechanism could be applied, if a material variation occurs.*

We propose that IPART should apply this mechanism to Essential Water as part of its 2019-23 review. This will enable us to adjust our revenue at the start of the subsequent regulatory period, based on a material variation between actual water demand over the 2019-23 determination period and the forecast used by IPART to make the determination. 'Material variation' is proposed to be ± 5 per cent of sales over the whole determination period. Only the impact of a variation outside this level would be adjusted for.

Under the proposed mechanism, Essential Water would bear volume risk up to the ± 5 per cent threshold (or 'deadband'), and customers would bear volume risk beyond the threshold.

It is reasonable for water businesses to bear and manage the revenue risk associated with normal deviations from average weather conditions and demand (i.e. within the deadband) and for customers to be exposed to some volume risk (i.e. volumes outside of the deadband). This is consistent with the findings by IPART in the recent Sydney Water determination, as reproduced in Box 2-3 below.

[11] IPART 'Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020Water — Final Report June 2016'. Page 151.

**Box 2-3: IPART's demand volatility adjustment mechanism for Sydney Water[12]**

IPART's demand volatility adjustment mechanism for **Sydney Water**

*We recognise there is some uncertainty around Sydney Water's water sales forecasts. In the 2012 price review, we decided to provide a demand volatility adjustment mechanism to adjust Sydney Water's revenue requirement in subsequent determination periods if the difference between actual and determined water sales exceeded a 'deadband' of 10% (+ or -). Table 8.1 above shows that this deadband was not exceeded during the 2012 determination period. We therefore have not used this mechanism to adjust Sydney Water's revenue requirement for the 2016 determination period.*

*We consider there remains merit in providing a demand volatility adjustment mechanism. This is important for both protecting customers from potential over-recovery over the 2016 determination period, resulting from excess sales, and protecting Sydney Water from under-recovery if it sells less than expected over this period.*

*While our decisions in this 2016 Determination cannot bind a future Tribunal, we consider an adjustment to revenue should be made if there is a material variation between the actual level of water sales over the 2016 determination period and the forecast water sales used in making this determination.* ***We consider a material variation to be more than 5% (+ or -)*** *for the following reasons:* [emphasis added]

- *Historical data shows that + or - 5% variation appears to cover normal deviations in weather and demand conditions that Sydney Water should be able to manage.*
- *Sydney Water considers the 10% (+ or -) deadband used for the 2012 determination period is too wide and it is highly unlikely that Sydney Water would trigger this threshold even if restrictions were implemented in the next four years.337*
- *It balances Sydney Water's upside risk (ie, Sydney Water can underestimate demand and over-recover revenue) and downside risk (Sydney Water can overestimate demand and subsequently under recover revenue, which may impact their ability to finance debt obligations).*

*In our Draft Report, we decided not to specify a deadband within which the demand volatility mechanism would not apply. We have changed our decision after considering stakeholder submissions from Sydney Water and Hunter Water. [emphasis added]*

*Sydney Water considered that a symmetric deadband should be specified in advance to provide certainty to Sydney Water, its customers and its shareholder about when prices and revenue might be adjusted. Sydney Water also recommended a deadband of +/-5%.*

*Hunter Water noted the removal of the specified deadband, and requested that we consult with agencies well before the next price review to determine how to best make the revenue adjustment.*

*To further improve regulatory certainty, we will consult as part of the next price review on how the volatility mechanism could be applied, if a material variation were to occur.*

Accordingly, Essential Water proposes that a demand volatility adjustment mechanism with a **± 5 per cent materiality threshold** consistent with the methodology adopted for Sydney Water should be a feature of the Essential Water 2019-23 determination. Any material variation would be adjusted for at the subsequent (2023) determination.

[12] IPART 'Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020Water — Final Report June 2016'. Pages 151-152.

We propose that IPART applies the formulas and approach outlined in Appendix 1 to (1) assess whether the materiality test has been triggered, and (2) calculate the amount of any demand volatility adjustment. The proposed approach outlined in Appendix 1 provides clarity and transparency on how the mechanism would be triggered (i.e. based on whether actual revenues are outside of the business as usual deadband) and how any adjustment amount would be calculated. This should provide greater clarity to our business and our customers on the basis of which future revenues and prices may be adjusted.

**Should the demand volatility adjustment mechanism be triggered for the 2014 period?**

As highlighted above, a demand volatility adjustment mechanism was contained in the IPART 2014 determination and IPART has discretion over whether the mechanism has been triggered for the current 2014 regulatory period. If the mechanism has been triggered, an adjustment would then need to be made to the notional revenue requirement for the 2019-23 determination to account for the volume variance outside of the deadband. Essential Water is not seeking the demand volatility adjustment mechanism for the 2014 period to be triggered at this time in recognition of affordability concerns for customers in the region.

## 3.3 Annual adjustments to the cost of debt

In its February 2018 review on the WACC method to apply to water utilities, IPART indicated that it would update the cost of debt annually within a regulatory period, but decide how annual changes are passed through to customer prices on a case-by-case basis, as part of the price review process.

> *4.6.2 We will decide between annual price changes or true-up as part of our determination*
>
> *We can see merit in both points of view. The different perspectives reflect the different circumstances of each organisation. For this reason, we have decided not to impose a uniform rule on all regulated firms. Instead, we will decide whether to apply annual price adjustments or the true-up on a case-by-case basis, as part of our review process. In reaching this decision, we will consider any submissions from the regulated business, its customers and other relevant stakeholders. Neither option would be considered the default.*
>
> *Final Decision*
>
> *10 Update the regulatory cost of debt annually, and decide whether to pass through changes via annual price adjustments or a true-up in the subsequent period:*
>
> - *as part of the price determination,*
> - *and on a firm-by-firm basis.*[13]

Under its new trailing average approach for estimating the historic and current costs of debt, IPART will update its decision on the cost of debt each year. IPART considered whether:

- prices should be adjusted each year to reflect the updated cost of debt, or
- the regulated business should store the price changes until the start of the next regulatory period, when IPART would implement the changes through an NPV-neutral 'true-up' to the regulatory revenue requirement for the subsequent regulatory period.

IPART considers that each option should be equivalent in present value terms, so the decision to take one approach or the other should have no impact on the value of a regulated firm. Likewise, the effect on the firm's customers should also be equivalent in present value terms.

[13] IPART Review of our WACC method Final Report Research February 2018. Page 39.

In summary, we concur that the annual updates to the cost of debt (and resulting WACC) can either be passed through as part of the annual pricing changes to customers, or can be trued-up in the next regulatory period, ensuring both options are equivalent in present value terms via discounting by the WACC rate.

Essential Water proposes to apply the annual updates to the cost of debt as part of the annual price change process. Essential Water addresses this issue in Chapter 9 'Rate of Return' in Section 4.1.2.

### 3.4 Other annual adjustments

Essential Water proposes that annual adjustments are made to the form of control for the following items:

- inflation - using IPART's standard approach of calculating and applying the Consumer Price Index (CPI),
- the costs for the new bulk water supply arrangements, as discussed in Section 4, and
- cost pass through amounts as discussed in Section 5.

## 4 INCORPORATING THE NEW BULK WATER SUPPLY ARRANGEMENTS

Bulk water supply arrangements in Broken Hill are changing for the 2019-23 determination period as a result of the new Wentworth to Broken Hill pipeline, being constructed and to be operated by WaterNSW.

The 270-kilometre pipeline will supply up to 37 megalitres of a peak daily demand of raw water to Essential Water in Broken Hill as the local water provider. Essential Water will continue to retain responsibility for water treatment and water distribution to its customers.

The raw water will be sourced near Wentworth on the Murray River, with the pipeline being constructed underground and generally following the Silver City Highway corridor to Broken Hill.

### 4.1 How are the costs of the pipeline passed through to customers?

The costs to construct, operate, maintain and integrate the Wentworth to Broken Hill pipeline into Essential Water's operations are separated into the following categories, including 'separable portions' (SPs) and consequential works:

- **SP1** – the costs incurred by WaterNSW for the consortium of John Holland, MPC Group and TRILITY to design, construct, operate and maintain the Wentworth to Broken Hill pipeline. The WaterNSW costs for SP1 activities are the subject of a separate IPART determination that will form the basis of funding via the NSW Government's Restart NSW fund (established in 2011 to fund and deliver high priority infrastructure). Infrastructure NSW is responsible for assessing and recommending Restart NSW projects.
- **SP2** – incudes provision of the final Wentworth to Broken Hill pipeline pumping station, 21km of pipeline and integration works with Essential Water's network. The capital costs incurred by WaterNSW to construct these assets as part of the new bulk water transportation arrangements will be funded directly by the NSW Government and 'gifted' to Essential Water at nil value upon completion. While the NSW Government is meeting the capital costs of SP2 activities, Essential Water is responsible for the ongoing operating and maintenance of SP2 assets.
- **SP3** – the electricity supply needed to facilitate pipeline operation incurred by WaterNSW that will be funded directly by Government and 'gifted' to Essential Water at nil value upon completion. The NSW Government is meeting the capital costs of SP3 activities. Essential Water has not included any incremental operating and maintenance costs for SP3 assets in this submission, with any incremental SP3 operating expenditures incurred by Essential Energy to be the subject of a separate funding application by Essential Energy to Government, or to be recovered through the electricity determination process.

- **Consequential works** – additional upgrades to Broken Hill's water reticulation network are required as a consequence of installation of the new pipeline, including the provision of alternative water supplies to those customers who will be disadvantaged by the reconfiguration of the supply system, and maintaining current customer service standards.

Costs for the above works are discussed in Chapter 6 'Capital expenditure' and Chapter 7 'Operating expenditure'.

The new supply arrangements will place a spotlight on the water and sewerage pricing arrangements for the region. The NSW Government has advised that:

> *The Independent Pricing and Regulatory Tribunal (IPART) will determine the pricing for customers in Broken Hill. Details of the water pricing structure will be finalised in 2019. IPART will ensure that the share of the cost borne by Essential Water customers in Broken Hill is fair and affordable. All other costs above the customer share determined by IPART will be met by the NSW Government.*[14]

The following sections outline how the four categories of costs relating to the Wentworth to Broken Hill pipeline (SP1, SP2, SP3 and consequential works) have been addressed in Essential Water's submission.

### WaterNSW SP1 costs for the Wentworth to Broken Hill Pipeline

The following outlines how the **SP1** costs of the new water supply arrangements for Broken Hill have been included in Essential Water's 2019-23 IPART submission:

- the efficient annualised costs of the Wentworth to Broken Hill pipeline as incurred by WaterNSW will be determined by IPART in a separate, concurrent determination and passed through to Essential Water via charges levied by WaterNSW,
- Essential Water will pass through the IPART-approved WaterNSW costs when setting its 'network use of system' charges to customers, less any direct funding provided by the NSW Government for these assets,
- to avoid doubt, Essential Water has not included estimates of the WaterNSW IPART-approved charges in its revenues or prices as part of this submission for water and sewerage distribution and reticulation services. Instead, Essential Water proposes that the culmination of the IPART-approved distribution charges for Essential Water and the IPART-approved bulk water transportation charges for WaterNSW takes place as part of the annual price change process,
- this is akin to the Network Use of System model that forms the basis of the electricity distribution (Essential Energy) and transmission (TransGrid) charging regime. The proposed Network Use of System model for water is illustrated in Appendix 3,
- the alternative approach would be to include a line item in our operating expenses for the estimated annual costs of the Wentworth to Broken Hill pipeline to be determined by IPART and to also include an equal and offsetting adjustment that assumes full Government funding (i.e. the net impact on revenues and prices would be nil). While this alternative approach is simpler, it may lack in providing visible separation of the WaterNSW and Essential Water costs, and on this basis has not been adopted by Essential Water for this submission,
- the NSW Government has indicated it will meet the efficient costs of the Wentworth to Broken Hill pipeline, which we have assumed to mean the efficient costs as approved by IPART in the WaterNSW determination. Therefore we have assumed the NSW Government will fund the IPART-approved costs for WaterNSW via the annual pricing process (as described above) as the community's capacity to pay will have been fully met by the IPART-approved charges for Essential

[14] WaterNSW Community Update October 2017 River Murray to Broken Hill Pipeline http://www.waternsw.com.au/__data/assets/pdf_file/0004/128533/Community-Update-October-2017.pdf

Water with no 'headroom' for additional price increases. If this assumption does not prove true, Essential Water will revisit this matter as part of our proposed Wentworth to Broken Hill cost pass through event and/or in our response to the IPART draft determination, and

- for pricing purposes, we have assumed the impact on Broken Hill customers for the Wentworth to Broken Hill pipeline SP1 bulk water transportation costs is nil, as the funding for the efficient costs for the construction, operation and maintenance of the pipeline contained in the IPART-approved prices charged by WaterNSW is assumed to be fully met by the NSW Government and therefore not included in water prices for Broken Hill customers.

### SP2 costs for ancillary works

As outlined above, the NSW Government is meeting the capital costs of the **SP2** ancillary works through direct funding to WaterNSW. Once built, WaterNSW will 'gift' the SP2 assets to Essential Water at nil capital value. Therefore, the capital costs of the SP2 ancillary works will not be included in the revenues and prices proposed by Essential Water.

Essential Water is responsible for the ongoing operating and maintenance costs associated with the gifted SP2 works. These operating costs are included in the forecasts contained in Chapter 7 'Operating expenditure'.

### SP3 costs for electricity infrastructure

The NSW Government is meeting the capital costs of the **SP3** electricity infrastructure works through direct funding to WaterNSW. Once built, WaterNSW will 'gift' the SP3 assets to Essential Water at nil capital value. Therefore, the capital costs of the SP3 electricity infrastructure will not be included in the revenues and prices proposed by Essential Water.

Essential Water has not included any ongoing operating and maintenance costs associated with the gifted SP3 works.

### Consequential works

Approximately $59 million in direct capital costs for additional upgrades to Broken Hill's water reticulation network are required as a consequence of installation of the new pipeline, including the provision of alternative water supplies to those customers who may be disadvantaged by the reconfiguration of the supply system.

The consequential works are summarised below. More detail on the need for the consequential works program is provided in Chapter 6 'Capital expenditure' and in confidential Attachment 4 'Water Strategic Plan'.

**Essential Water is seeking external funding from the NSW Government for the entire consequential works program.** Therefore, the revenues and prices contained in this water and sewerage pricing submission exclude the costs of the required consequential works.

We propose to include a 'consequential works pass through event' to address the circumstance where Essential Water's application for Government funding for some or all of the works is not successful. The intent of the pass through event is to provide Essential Water with the opportunity to seek to include some or all of the consequential works in customer tariffs once we have visibility of the funding decision from Government, which will occur after our submission is lodged with IPART.

In summary, the proposed consequential works are designed to achieve the following outcomes:

- **Continue to supply existing Menindee Pipeline customers.** Essential Water customers who are supplied water from the existing Menindee pipeline will no longer have access to water from the Menindee pipeline from late 2019 when supply to Broken Hill from the Darling River is scheduled to cease. Works approved in the original business case for the Wentworth to Broken Hill pipeline, but outside the WaterNSW scope, are critical to maintain supply to the following customers whose supply may be interrupted due to the new bulk water supply arrangements:
  - water supply for Sunset Strip and Menindee Lake Caravan Park, and
  - backflow from Stephens Creek to Menindee pipeline customers.

It is proposed to construct two small diameter pipelines along the existing Menindee pipeline corridor to meet water supply targets for existing Menindee pipeline customers, as outlined in Figure 2-2.

**Figure 2-2: Proposed Sunset Strip small diameter pipeline route and small diameter pipeline route for graziers**

*Figure 3: water transfer options from Menindee to Sunset Strip*

As illustrated in Figure 2-2, we propose that Sunset Strip and the Caravan Park customers will be supplied via a 125mm HDPE diameter rising pipeline from the existing Darling River off-take at Menindee. A second 180/140mm diameter gravity pipeline will be constructed to supply water to the existing grazier customers from the Stephens Creek Reservoir.

- **Maintain reliability of raw water supply to Mica Street Water Treatment Plant (WTP).** The Mica Street WTP requires a reliability of raw water supply of **99.99 per cent** to ensure uninterrupted drinking water to retail customers. This target allows for up to approximately 12 hours of raw water supply interruptions prior to drinking water supplies to customers being affected.

  The Wentworth to Broken Hill pipeline system will provide an estimated raw water reliability of **98 per cent** to the Mica Street WTP - which equates to 7.3 days of supply outage(s) per annum. It is anticipated that any single outage will take no longer than three days to restore the raw water supply.

  To ensure continuity of service and critical backup supply to the Mica Street WTP, we propose to refurbish the Stephens Creek Supply zone to provide up to three days of peak season demand for any single supply interruption event and ensure that reliability of the raw water supply to Mica Street WTP meets its target of 99.9 per cent. This includes the following investments:

  - a new pumping station at Stephens Creek,
  - replacement of the remainder of Section 4 of the Rocla pipeline (approximately 1.5km),
  - a new 200ML storage facility at Stephens Creek, and
  - replacement of Section 5 of the Rocla pipeline (approximately 3km through streets of Broken Hill to Mica Street).
- **Maintain raw water quality requirements to existing Broken Hill customers.** A 'catchment to tap' risk assessment undertaken jointly by Essential Water and WaterNSW identified the risk of a blue green algae (BGA) outbreak developing within the WaterNSW 760ML bulk water terminal storage.

  Such an outbreak poses the risk of up to 50,000 cells per mL of water and toxicity of 50 ng per mL entering the raw water supply to Mica Street WTP. The Wentworth to Broken Hill pipeline project

proposes to include in storage measures to reduce the risk of BGA entering the off-take system (such as aeration); however, these measures are unlikely to be sufficient to prevent BGA entering the raw water supply to the Mica Street WTP.

To manage the impact of a BGA outbreak on direct raw water customers, we propose refurbishing a redundant filter system within the Mica Street WTP to remove both BGA cells and powdered activated carbon (PAC), following its use as a treatment measure, during occasions that BGA and toxins exceed service level targets.

- **Decommission brine disposal pond.** Ongoing water supply security concerns and water shortages periodically affect Broken Hill. In 2014, an emergency water supply system was commissioned at Broken Hill in response to foreseen water shortages and increases in salinity at Broken Hill's primary water sources, the Darling River and Menindee Lakes.

  The emergency water supply system consisted of bores with a pipe and pump system to supply raw water to the existing Mica Street WTP at Broken Hill, a Reverse Osmosis (RO) system at Mica Street WTP to treat high salinity water, and a brine disposal system which included an approximately 10 kilometre long brine transfer pipeline to a large brine pond, which was constructed by Essential Water under a Deed of Consent to Licence Agreement on Crown Land leased by Perilya Mines.

  Full operation of the RO system at Mica Street WTP ceased in September 2016, following rainfall in the reservoir catchment and the return of flows in the Darling River, with associated subsidence of salinity issues. Since then, three units have been decommissioned and removed, and the four remaining units have been run in a care and maintenance mode to keep them in service should they be needed in the future.

  The aim of this work is to decommission the brine ponds and return the land to Perilya Limited by 25 August 2020, at which point the Crown Lands Licence expires. This requires removal of the brine pond contents, liner, pipework and any ancillaries. The earthworks may remain as Perilya Limited plans to use the site for a tailings dam in the future.

  On completion of the Broken Hill Short Term Water Supply project, the costs for the brine pond decommissioning were transferred to the Broken Hill Long Term Water Supply project budget. This business case is seeking to access these funds to commence the decommissioning process as part of the transition to the Wentworth to Broken Hill pipeline system.

As indicated above, in some instances, items related to service level shortfalls were included in the original approved Wentworth to Broken Hill pipeline business case (for example, the Stephens Creek Pump Station replacement), but were subsequently removed from the scope of works by WaterNSW. This has contributed to the need for our consequential works program.

**Government funding**

The capex, opex, revenue and prices contained in this submission exclude the impact of consequential works as separate Government funding is being sought.

Essential Water is in the process of applying to Infrastructure NSW for a review of our consequential works program as a precursor to obtaining financial support from Government via the $481.1 million Restart NSW – Safe and Secure Water program. As the Government's review process has not been finalised in sufficient time to be included in our submission, Essential Water has provided cost estimates where relevant on an 'indicative' basis.

**Pass through event**

We propose to include consequential works as a pass through event in the IPART submission to address the potential that Essential Water's application for Government funding for some or all of the works is not successful.

The intent of the pass through event is to provide Essential Water with the opportunity to seek to include some or all of the consequential works in customer tariffs once we have visibility of the funding decision from Government, which we expect will occur after our submission is lodged with IPART on 29 June 2018. This is discussed further in the following Section 5 'Cost pass through arrangements'.

### 4.2 Cost, tariff and funding model for the new supply arrangements

Appendix 3 provides a diagram that outlines the proposed cost, tariff and funding flows for the new water supply arrangements. The proposed model is based on the 'Network Use of System' (NUOS) approach to costs and tariff setting under the National Electricity Rules, which we consider to be applicable to the new bulk water supply arrangements. The proposed model is designed to provide transparency to the new and more complex regulatory arrangements between affected parties.

### 4.3 Bulk water costs

Bulk water costs are currently addressed through the licence fees we pay. The costs of obtaining and maintaining our water licences have been included in our proposed operating expenditures as outlined in Chapter 7 'Operating expenditure'.

Essential Water currently has two primary river extraction licences from the Darling River, which permit it to draw 10 GL per annum.

- Water Access License 8584 for 9.75GL per annum provides raw water to Menindee WTP, Sunset Strip, Pipeline consumers and Broken Hill, and
- Water Access License 13452 of 0.25GL per annum provides raw water to Menindee Oval, School and standpipe.

The new Murray Pipeline is expected to deliver 8.1GL per annum from the Murray River with 0.4GL retained from the Darling River for the Menindee supply. The reduction to 8.5GL per annum is not expected to impact Essential Waters ability to continue to supply customers with a reliable water supply as total water consumption is around 5 GL per annum.

## 5 COST PASS THROUGH ARRANGEMENTS

Essential Water considers that a well functioning regulatory framework needs to ensure a reasonable sharing of risks and that a business should be able to recover its efficient costs. The inclusion of an effective cost pass through framework will improve the ability of water networks to invest in and operate their networks, while providing an appropriate allocation of risks between the business and its customers.

### 5.1 What is IPART's approach to cost pass through events?

IPART's regulatory framework does not generally provide for many of the cost pass through events that are commonplace for other economic regulators. IPART's rationale is summarised below in extracts from the 2016 Sydney Water decision:

> *Under the current form of regulation, we set efficient operating and capital expenditure allowances for the regulatory period with an expectation that costs can fluctuate up and down, some new costs will arise, and some expected costs will not occur. If there is no bias in the forecasts, we would expect the gains from under spends to offset the losses from overspends over the long term.*
>
> *We consider our limited application of cost pass-throughs is working effectively at the moment. Under the current form of regulation, risk is shared between regulated businesses and customers to minimise the likelihood and cost of downside risk and maximise the likelihood and benefits of upside risk.*
>
> *Sydney Water clarified its proposed framework for a broader application of cost pass-through mechanisms, noting that its proposed framework includes both cost pass-through mechanisms for uncertain events as well as cost contingency schemes for material changes in project costs. While this clarification makes the proposal clearer, it does not affect the*

*reasons we have for maintaining the current approach for passing through costs during the determination.* [15]

*…*

*Decision*

*4 We have decided not to broaden our approach to cost pass-through mechanisms at this time (noting that we have extended the application of our cost pass–through approach to include Shoalhaven transfers in addition to Sydney Desalination Plant's additional costs when it operates).*

*3.5.1 Reasons for our decision*

*We consider that cost pass-through mechanisms should only be applied in exceptional circumstances. Box 3.3 outlines the circumstances under which we consider cost pass-throughs should apply.* [16]

**Figure 2-2: IPART circumstances where a cost pass through mechanism may apply (from Sydney Water determination)**

**Box 3.3 Circumstances when cost pass-through mechanism may apply**

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 that fully or partially offset the direct cost of the event.[a]
- 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 both cost increases and cost decreases (in cases where the risk can result in both cost increases and cost decreases).
- It is clear that the cost pass-through will result in prices that better reflect the efficient cost of service.

a Under the IPART Act, the costs to be passed through must be specified in the price determination.

Under the current regulatory model, IPART sets Essential Water's prices on a forward-looking basis for a four-year period. Prices are set to be sustainable over the regulatory period. However, there will inevitably be uncertainties during the period where it is impractical (if not impossible) to forecast the efficient costs of these uncertainties at the time prices are set. For example, the introduction of a new tax (or a repeal of an existing tax or a change to an existing tax rate), even though it may materially

[15] IPART 'Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020Water — Final Report June 2016'. Page 60.

[16] Ibid, Page 63.

increase or decrease the costs of providing regulated services, would not be adjusted for in IPART's regulatory framework within a regulatory period unless a pass through mechanism is available.

In the above example, Essential Water is unlikely to have an influential role in the policy debate around the introduction or repeal of a tax or a change to an existing tax rate, yet the outcome could materially change the costs of providing regulated services. This is only one example of an event that could take place within a regulatory period where a cost pass through framework would be a useful tool for ensuring a business has the opportunity to recover its efficient costs and customers receive the benefit of changes that reduce the costs of providing regulated services.

## 5.2 How do other regulators deal with cost pass through events?

While we acknowledge IPART's approach to cost pass through events, where Essential Water currently has no pass through events in its current IPART 2014 determination, we contrast this with the eight pass through events in Essential Energy's current Australian Energy Regulator (AER) 2014-19 determination. The AER-approved pass through events are reproduced in Box 2-4.

**Box 2-4: AER cost pass through decision for Essential Energy[17]**

**AER's cost pass through decision for Essential Energy – April 2015**

*The pass through mechanism of the National Electricity Rules (NER) recognises that a distributor can be exposed to risks beyond its control, which may have a material impact on its costs. A cost pass through enables a distributor to recover (or pass through) the costs of defined unpredictable, high cost events that are not built into our distribution determination. The NER includes the following prescribed pass through events for all distributors:*

- *a regulatory change event,*
- *a service standard event,*
- *a tax change event,*
- *a retailer insolvency event,*
- *any other event specified in a determination as a pass through event (nominated pass through event).*

*This chapter sets out our final decision on the additional pass through events that will apply to Essential Energy for the 2015–19 regulatory control period.*

*15.1 Final decision*

*Our final decision is that the following nominated pass through events will apply to Essential Energy for the 2015–19 regulatory control period:*

- *insurance cap event,*
- *terrorism event,*
- *natural disaster event,*
- *insurer's credit risk event*

We accept that there are some differences between electricity distribution networks and water and sewerage networks. However, with the exception of a retailer insolvency event, which is not relevant for a water business operating in NSW due to the lack of retail water contestability, the events outlined in Box 2-4 would appear to be equally outside of a water or electricity business's control and equally

[17] AER FINAL DECISION Essential Energy distribution Determination 2015−16 to 2018−19 Attachment 15 – Pass through Events, April 2015. Page 15-6.

relevant to Essential Energy's water and electricity businesses (which are regulated by IPART and the AER, respectively).

Essential Water considers that if an infrastructure business is not provided with the opportunity to recover its efficient costs, as would be the case if there was a positive change event such as the events outlined in Box 2-4, where the efficient costs were not able to be recovered within a regulatory period, there would be a diminishing of the incentive to invest in the network, which is not in the long term interests of our customers.

The following section discusses how the *Australian Energy Market Commission* (AEMC) arrived at its decision to implement a cost pass through framework that provides an appropriate balance in the allocation of risks between a network business (to recover costs to attract sufficient investment in its network) with end customers (to ensure that prices are no more than necessary to provide an appropriate level of service).

**How did the AEMC arrive at its position for the National Electricity Market (NEM)?**

Confirmation and clarification of the pass through arrangements in the National Electricity Market (NEM) occurred as a result of a National Electricity Rule change proposal submitted by Grid Australia to the AEMC in 2011.[18] Grid Australia made a request to the AEMC to review the cost pass through provisions for network service providers as contained in the National Electricity Rules (the 'rule change request'). The rule change request consisted of four components:

- introduction of a definition for a prescribed 'natural disaster event',
- introduction of a definition for a prescribed 'insurance cap event',
- provision of the ability for transmission network service providers to nominate additional pass through events, and
- provisions to address the 'dead zone' issue for events that occur in a previous regulatory control period, but which have not been incorporated in the network service providers' forecasts for the subsequent regulatory control period.

When assessing whether to approve the rule change request, the AEMC concluded that:

> *Cost pass throughs are an important mechanism under the NER in respect of economic regulation of NSPs. They are needed because of the inability of NSPs, and the AER, to forecast all possible events that could affect the ability of NSPs to provide network services at the time of setting the revenue or regulatory determinations. NSPs should be provided with the reasonable opportunity to recover, in future regulatory years, the efficient costs they incur as a result of unexpected events.* ***The inability to recover these costs would otherwise have a significant financial effect on the ability of NSPs to invest in and operate their networks****.* [emphasis added]
>
> *However, the natural incentive properties of cost pass throughs are very weak. NSPs should have effective incentives in order to promote economic efficiency with respect to the network services they provide.*
>
> *On that basis, the Commission considers that a rule is required to allow NSPs the ability to nominate pass through events specific to their circumstances, but subject to a set of nominated pass through event considerations.*[19]

The AEMC went on to state the following:

[18] AEMC RULE DETERMINATION National Electricity Amendment (Cost pass through arrangements for Network Service Providers) Rule 2012 Rule Proponent(s) Grid Australia 2 August 2012.

[19] AEMC RULE DETERMINATION National Electricity Amendment (Cost pass through arrangements for Network Service Providers) Rule 2012 Rule Proponent(s) Grid Australia 2 August 2012. Page 9.

*The rule as made provides TNSPs with the ability to nominate additional pass through events when submitting their revenue proposals. This would provide an appropriate balance in the allocation of risks between NSPs (to recover costs to attract sufficient investment in their networks) with end customers (to ensure that prices are no more than necessary to provide an appropriate level of service).*

*However, as discussed in the draft rule determination, in order to provide NSPs, the AER and consumers with additional certainty, the rule as made prescribes considerations that the AER must take into account when deciding whether to accept the NSP's additional nominated pass through events.*[20]

As noted by the AEMC, it is important for infrastructure businesses to have the reasonable opportunity to recover, in future regulatory years, the efficient costs they incur as a result of unexpected events. The inability to recover these costs would otherwise have a significant financial effect on the ability of water networks to invest in and operate their networks.

A cost pass through event in these circumstances would also provide an appropriate balance in the allocation of risks between Essential Water (to recover costs to attract sufficient investment in its network) with end customers (to ensure that prices are no more than necessary to provide an appropriate level of service).

Essential Water considers that the matters considered relevant by the AEMC should also apply to water networks in NSW. In particular, like electricity networks, water networks should:

- be provided with the reasonable opportunity to recover, in future regulatory years, the efficient costs they incur as a result of unexpected events. The inability to recover these costs would otherwise have a significant financial effect on the ability of water networks to invest in and operate their networks, and
- in addition to a core set of pass through events, be provided with the ability to nominate additional pass through events when submitting their revenue proposals. This would provide an appropriate balance in the allocation of risks between water networks (to recover costs to attract sufficient investment in their networks) with end customers (to ensure that prices are no more than necessary to provide an appropriate level of service).

## 5.3 Proposed pass through events

Essential Water proposes that IPART adopt a cost pass through framework that adopts some elements of the cost pass through framework that has been operating for many years in the National Electricity Market (NEM) and nominated pass through events that are specific to our operations in the Broken Hill region. We propose that IPART adopt the following pass through events:

1. a regulatory change event,
2. a drought relief event,
3. a Wentworth to Broken Hill Pipeline event, and
4. a consequential works event.

The proposed definitions for the above events are contained in Appendix 1 and are adapted from the definitions in the National Electricity Rules (Chapter 10) for our proposed 'regulatory change event' and Essential Water's unique circumstances for pass through events 2, 3 and 4.[21]

[20] Ibid. Page 20.

[21] AER FINAL DECISION Essential Energy distribution Determination 2015−16 to 2018−19 Attachment 15 – Pass through Events, April 2015. Page 15-6.

We consider that each of the above pass through events would meet IPART's specified circumstances where a cost pass through would apply as set out in Figure 2-2.

A cost pass through framework including general and specific pass through events was a core feature of the electricity regulation framework that IPART applied to the NSW electricity distribution network services providers when IPART had oversight of the regulated revenues and prices for these businesses. We note that IPART previously established a mechanism for, and approved, a cost pass through event for a change in licence conditions for the NSW DNSPs.[22] We suggest this is would be catered for in the regulatory change event we have proposed.[23]

**Materiality threshold**

We have assessed what we believe to be an appropriate materiality threshold for a positive or negative change event, based on prior regulatory decisions and internal analysis. We note that IPART has previously applied a materiality threshold to Country Energy (Essential Energy's predecessor) as follows:

> *Any amount relating to a Positive Change Event if the average annual change in costs in respect of that event (as calculated in accordance with clause 2.2 of Annexure 1)* ***does not exceed 1 per cent of the average annual smoothed revenue requirement*** *for the DNSP asset out in Annexure 12 of the Determination.*[24] [emphasis added]

and

> *For the purposes of the application of clause 6.6.1, an event results in a Distribution Network Service Provider incurring materially higher or materially lower costs if the change in costs (as opposed to the revenue impact) that the Distribution Network Service Provider has incurred and is likely to incur in any regulatory year of a regulatory control period, as a result of that event, exceeds* ***1 per cent of the annual revenue requirement*** *for the Distribution Network Service Provider for that regulatory year.*[25] [emphasis added]

In recognition of the smaller scale of the Essential Water business, we consider that a materiality threshold of **one** per cent of Essential Water's annual revenue requirement, or approximately $200,000 may be too low and that it could be seen as leading to frequent triggers, which is not the intent. We therefore propose a materiality threshold of **2.5 per cent of the annual revenue requirement**, which would be in the order of a change in costs of $500,000.

**IPART Act and cost recovery methodology**

We note that in the IPART 2016 determination for Sydney Water, there was some contention as to whether there are constraints in the IPART Act that limit IPART's ability to implement cost recovery mechanisms, such as those proposed by Essential Water. Our proposals are based on the assumption that IPART is able to implement a robust cost recovery framework if it is satisfied that doing so would be in the long term interests of customers.

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[22] In December 2005 the DNSPs Country Energy, EnergyAustralia and Integral Energy each lodged general and specific cost pass-through applications with the Tribunal, relating to the imposition of the New Licence Condition. These applications are on IPART's website.

[23] See IPART decision on the *Design, Reliability and Performance Licence Condition* cost pass through application by Country Energy in 2005.
https://www.ipart.nsw.gov.au/files/sharedassets/website/trimholdingbay/nsw_distribution_network_cost_pass_through_review_-_statement_of_reasons_for_decision_-_5_may_2006.pdf

[24] IPART Decision on Design, Reliability and Performance Licence Condition imposed on Distribution Network Service Providers by the Minister for Energy and Utilities dated 1st August 2005. Page 4.

[25] NER Chapter 10. See definition for 'materially'.

If IPART considers that this is not the case, and that there is a legislative constraint that limits it from determining a cost pass through framework to provide Essential Water with the opportunity to recover its efficient costs, thereby reducing the incentive to efficiently invest in our network, we request that IPART highlight its concerns in is draft and final determinations.

### 5.4 Summary

Essential Water proposes the following cost pass through mechanism for the 2019-23 determination:

- **four pass through events**: a regulatory change event, a drought relief event, a Wentworth to Broken Hill Pipeline event and a consequential works event,
- a **symmetric framework** that applies for both positive and negative cost events, and
- a **materiality threshold of 2.5 per cent** of the annual revenue requirement.

Essential Water considers it important for an infrastructure business to have the reasonable opportunity to recover, in future regulatory years, the efficient costs it incurs as a result of unexpected events. The inability to recover these efficient costs would otherwise have a significant financial effect on the ability of water networks to invest in and operate their networks.

A cost pass through event in these circumstances would also provide an appropriate balance in the allocation of risks between Essential Water (to recover costs to attract sufficient investment in its network) with end customers (to ensure that prices are no more than necessary to provide an appropriate level of service).

## 6 INCENTIVE MECHANISMS

One of the matters that the Tribunal is required to have regard to when making a determination or recommendation under section 15(1) of the IPART Act is:

> *(e) the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers.*

As outlined in IPART's December *2017 Guidelines for Water Agency Pricing Submissions,* and with respect to efficiencies, Essential Water was invited to include in its submission any other issues it considers relevant, with supporting reasons and analysis. For example, this may include:

> *Measures (and related information) to provide incentives for enhanced efficiency (eg, for its 2016 determination, Sydney Water proposed **an efficiency carryover mechanism**)*[26] *[emphasis added].*

This section outlines Essential Water's views on incentive mechanisms for providing water and sewerage services to the Broken Hill region.

It is common practice for economic regulators to include mechanisms in the regulatory framework that incentivise regulatory utilities to act in a manner that produces desired behaviours, where the inherent incentives in a *CPI minus X* are seen as weak or insufficiently strong to achieve the desired outcomes.

While IPART has traditionally not included explicit incentive mechanisms as part of its regulatory determinations, and has instead largely relied on the implicit incentives in a CPI-X framework, other regulators have included incentive mechanisms a core feature of the regulatory framework for utilities.

[26] Contained in IPART letter to CEO on 22 December 2017, Attachment D, page 23.

For example, the AER includes the following incentive mechanisms in its regulation of Essential Energy's electricity distribution network:

- Efficiency Benefit Sharing Mechanism (**EBSS**) - a continuous incentive for distributors to pursue efficiency improvements in operating expenditure (opex),
- Service Target Performance Incentive Scheme (**STPIS**) – a financial incentive to maintain and improve service performance,
- Capital Efficiency Sharing Scheme (**CESS**) - approximates efficiency gains and losses by calculating the difference between forecast and actual capex and shares these between a distributor (30 per cent) and customers (70 per cent), and
- Demand Management Incentive Scheme (**DMIS**) and **Allowance Mechanism** – the DMIS incentivises distributors to undertake non-network initiatives relating to demand management, while the Allowance Mechanism provides the distributors with funding for research and development in DM projects that have the potential to reduce long term network costs.

An efficiency carryover mechanism for seeking a continuous incentive to pursue efficiency improvements in opex has been specifically flagged by IPART for consideration and is discussed below.

## 6.1 Efficiency carryover mechanism

Regulators in a number of jurisdictions have introduced efficiency mechanisms to address a shortcoming in incentive frameworks, whereby the financial reward for achieving savings deteriorates over the length of a regulatory period. That is, in a four-year regulatory period, a saving (or efficiency gain) made in year one of the regulatory period results in four-years of additional profit, whereas an efficiency gain made in year three of the regulatory period results in just two years of additional profits.

The consequence is that there is an incentive to delay savings from the latter years of one regulatory period to the beginning of the next regulatory period. The delay in the incentive to seek efficiency savings results in potentially higher profits for businesses and a delay in the time in which cost savings are translated into lower prices for customers, both of which are undesirable for regulators and the community.

An efficiency carryover mechanism, such as the AER's efficiency benefit sharing scheme (EBSS), allows efficiency gains (or losses) to be held for a specified period of time (usually the length of the determination period), regardless of when the gains or losses are experienced. Relevant features include:

- the EBSS applies only to operating expenditures (opex),
- efficiency gains or losses are held for the duration of the regulatory period and adjusted as part of the revenue requirement for the subsequent regulatory period,
- the EBSS rewards systemic efficiency improvements and penalises systemic efficiency declines, with 'efficiency' assumed to be the expenditure levels and rate of change approved by the regulator,
- one-off efficiency gains (or losses) tend to largely offset, as a significant efficiency gain (or loss) in one year is offset by an efficiency loss (or gain) in the following year. This is intentional in order to reward genuine efficiency initiatives, while not rewarding or penalising (a) one-off events outside a business's control, and/or (b) unintentional outcomes, and
- the interaction between the EBSS and benchmarking is potentially contentious as the relationship between a revealed cost approach to setting operating expenditure that forms the basis of the EBSS is challenged when operating expenses are set (wholly or partially) through the use of benchmarking.

There is additional administration required when reporting on EBSS outcomes, and the financial impact of the EBSS needs to be incorporated into the investment governance process, adding additional complexity.

In its 2016 determination for Sydney Water, IPART approved an Efficiency Carryover Mechanism (ECM), which now forms part of the regulatory framework for targeting efficiencies moving forward for Sydney Water.[27]

While IPART has approved an ECM for Sydney Water, we do not believe it is appropriate for one to apply to Essential Water. This position was reached based on a number of relevant considerations, including the following:

- the small size of the Essential Water business and the increased administration costs associated with the introduction and ongoing reporting of an ECM suggest it would not provide value for money for the customers in the Broken Hill region, as customers would be asked to fund the additional administration costs through increased water and sewerage prices; and
- the increased complexity of the ECM with respect to the operational decisions and investment governance processes of a loss-making water business are not proportional to the potential benefits an ECM may deliver for Essential Water.

On balance, proposing an efficiency carryover mechanism does not appear to be a proportional response to achieve greater efficiency gains for Essential Water, as the additional costs to the community and complexities for the business are seen to outweigh the potential benefits for the business and its customers.

Essential Water proposes that an efficiency carryover mechanism does not form part of the 2019-23 determination and that IPART instead continues to rely on the inherent incentive properties of the CPI-X regulatory framework.

### 6.2 CESS / STPIS / DMIS & Allowance – type mechanisms

Should IPART includes CESS / STPIS / DMIS and allowance-type mechanisms?

No. For the reasons set out above for an efficiency carryover mechanism, the likely costs and complexities associated with introducing a CESS / STPIS / DMIS and allowance mechanism are likely to outweigh any associated improvements in efficiency or service delivery for the Broken Hill community and there is insufficient time to investigate these incentive mechanisms in any case.

These matters have not been raised by IPART for the upcoming review, but are noted in this submission for completeness, drawing on Essential Energy's familiarity with a range of incentive mechanisms through the regulation of its electricity distribution network.

## 7 OTHER CONSIDERATIONS

### 7.1 Removing the over-recovery of the sewerage system

In its submission guidelines and associated correspondence with Essential Water at the commencement of the 2019-23 determination, IPART has identified that it is considering whether to remove an 'over-recovery' of the sewerage system. IPART indicated:

> *Because of the changes made to the water usage charge in 2014, water service charges increased.* To minimise the impact on customers, we decided to not recover the full costs of the water system from water charges. Rather, we kept sewerage service and usage charges constant over the 2014 determination period and at the same level as the preceding period (even though sewerage costs were declining). In this way, sewerage charges recovered more than the cost of the sewerage system, to minimise the increase in water service charges. The

[27] Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020, Water — Final Report June 2016. Page 56.

over-recovery is about $3.1m ($2017-18) in net present value terms over the 2014 determination period.[28]

The over-recovery of the sewerage system is a legacy issue from the 2014 determination where the setting of regulated water and sewerage prices did not fully reflect the underlying cost structure of the respective services. This resulted in water prices being charged at less than the IPART-determined costs, while sewerage prices were set at greater than the IPART-determined costs, with the combined costs reflecting the total determined amounts.

It is not an over-recovery in the usual sense, where actual revenue collected for a service is higher than the revenue forecast for that service by a regulator in its pricing determination. This issue relates to whether the costs of the respective water and sewerage business have been allocated between the services on a cost-reflective basis, as the total costs reflect IPART's assessment of efficient costs.

IPART is now querying whether it is appropriate to unwind the sewerage over-recovery and implicit cross subsidy by lowering sewerage prices and implementing a corresponding rise in water prices. The net impact on the total revenues to be recovered of such a move would be nil, but the respective water and sewerage prices would be adjusted to unwind any cross-subsidy.

IPART has modelled that, based on the existing 2017-18 prices and projected revenue, the impact on prices of removing the over-recovery from the sewerage system while keeping all other price structures constant would add approximately $108 ($2017-18) to the residential water service charge and reduce the residential sewerage service charge by approximately $81 ($2017-18).

IPART has noted that, given the likely augmentation costs of the water supply to Broken Hill, water service charges may increase. Based on this assumption, and assuming customer preferences for stability in pricing structures as discussed in Chapter 4 ‘Customer Engagement’, IPART suggests it may be preferable to retain the over-recovery of the sewerage system in order to minimise any increase in water service prices.

It is apparent that there is no headroom in existing tariffs to protect those who may be negatively impacted from IPART’s suggested changes. Therefore, we agree with IPART’s assessment and propose that IPART does not specifically unwind the over-recovery of sewerage services (and does not correspondingly unwind the under-recovery of water services) at the 2019 determination.

Essential Water considers that the status quo would not adversely affect efficient investment in the water and sewerage services we provide.

## 7.2 Treatment of exempt customers

Under the NSW Water Management Act 2000 (the Act), certain customers, such as some schools, hospitals, churches, and charitable organisations are exempt from paying access charges. This means we cannot charge these customers an access charge. As IPART includes exempt customer numbers when calculating our availability charges, and we are not able to charge exempt customers the availability charge, we are currently unable to recover our efficient costs while complying with the Act without seeking separate Government funding or setting separate cost-reflective tariffs for exempt customers.

The amounts are not trivial. We estimate that the foregone revenue as a result of IPART’s approach to price setting for exempt customers is in the order of $0.4 million annually.

We do not think that the Act contemplates Essential Water bearing the costs of complying with the requirements for exempt customers. Nor do we consider that separate NSW Government funding for

[28] IPART letter to CEO on 22 December 2017, Attachment B ‘Guidelines for Water Agency Pricing Submissions – Water December 2017’. Page 2.

these costs is appropriate, when a pricing mechanism is available to ensure we are able to recover our efficient costs while complying with our legal obligations.

We seek the opportunity to work with IPART to resolve this matter through the existing pricing arrangements or through the introduction of cost-reflective tariffs for exempt customers.

The pricing arrangements for exempt customers are discussed in more detail in Chapter 12 ‘Tariff structures and price path’.

## 7.3 Outstanding issues from the 2014 determination

In preparing this submission, Essential Water has had regard to the small number of outstanding issues from the 2014 determination. These issues are discussed in Appendix 6 'Outstanding issues from the 2014 determination'.

# Chapter 3 – Service standards

# 1 SUMMARY

This chapter outlines the water and wastewater services that are provided by Essential Water.

Essential Water supplies treated water to Broken Hill and Menindee, and chlorinated (but presently unfiltered) water to Sunset Strip and Silverton.

A total of approximately 5,000 megalitres (ML) of water per year is supplied to around 9,600 residential customers and around 900 non-residential customers.

Essential Water also provides 'non-potable' water to rural connections along the Menindee to Broken Hill and Umberumberka to Broken Hill pipelines for stock and domestic, and commercial purposes.

Essential Water provides sewerage services to approximately 9,750 properties in the city of Broken Hill, including some houses and other buildings in the Perilya mining lease area.

**Box 3-1: Key points**

Key services provided by Essential Water:

- treated water – commonly known as 'potable' or drinking water. Water is disinfected and filtered to a standard that is fit for human consumption,
- untreated water – also referred to as 'raw' water. This is water in its natural state, prior to any treatment process,
- chlorinated water – raw water that has been treated with a chlorine disinfection process, but not filtered to remove solids and organic particles,
- effluent water – sewage or wastewater that is treated at a sewerage treatment plant before being re-used or discharged to the environment,
- sewerage services – Essential Water provides sewerage services to the city of Broken Hill and operates two sewerage treatment plants,
- liquid trade waste – Essential Water provides liquid trade waste services to non-residential customers in the city of Broken Hill,
- miscellaneous services – A range of miscellaneous services are offered to customers, generally one-off services with charges based on the cost of the specific service provided, and
- customer services – Essential Water strives to meet all industry standards required of a water utility. We measure customer service levels against a number of key indicators as detailed in this chapter. Essential Water has met or exceeded its customer service standard obligations over the 2014 regulatory period.

# 2 SERVICES PROVIDED BY ESSENTIAL WATER

## 2.1 Background

Essential Water protects and supports the community and the environment by providing high quality drinking water and sewerage services to the communities of Broken Hill, Menindee, Sunset Strip and Silverton. We are responsible for water reticulation, town water system management, and water treatment and wastewater management.

Essential Water supplies treated water to Broken Hill and Menindee, and chlorinated non-potable water to Sunset Strip and Silverton. A total of approximately 5,000 ML of water per year is supplied to around 9,600 residential customers and around 900 non-residential customers. This includes providing non-potable water to 46 rural connections along the Menindee to Broken Hill and Umberumberka to Broken Hill pipelines for stock, domestic and commercial purposes. The largest customer is the mining company, Perilya Limited (Perilya). Broken Hill Operations, a second mine, also operates close to Broken Hill. The two mining companies collectively account for approximately one-third of our customers' total water consumption.

Essential Water also provides sewerage services to approximately 9,750 properties in the city of Broken Hill, including some houses and other buildings in the Perilya mining lease area.

Essential Water's primary functions are to provide water supply, sewerage, liquid trade waste and miscellaneous services to our customers.

Major service categories provided by Essential Water are outlined below.

## 2.2 Major service categories

### Water reticulation

Water reticulation in Broken Hill extends from the Mica Street water treatment plant through to the customer's meter. Water is pumped from the treatment plant through a number of rising mains to service reservoirs located on elevated positions throughout the Broken Hill and Broken Hill South district. Water is delivered from these service reservoirs by gravity feed, so it is possible to maintain supply for a limited period during network failure events (e.g. power failure, water treatment plant failure, etc.).

Essential Water has undertaken a sustained program over a number of years to replace the larger distribution mains, in particular the larger asbestos cement pipes gravitating from the tanks. Since the distribution network is generally more than 50 years old, most of the distribution pipes are asbestos cement, with galvanised services to customers. Where the asbestos cement pipes have burst, or the galvanised pipes have corroded, they have been replaced with PVC pressure pipe. Customer service lines have been replaced with copper.

The entire distribution network is divided into separate pressure zones, which results in lower customer outages, faster repairs and lower losses in the event of a burst pipe.

### Water treatment

The Broken Hill Mica Street water treatment plant (WTP) was commissioned in 2010, replacing the original plant, which was constructed in 1952. The Mica Street WTP has a design capacity of 31.5ML per day of treated water. It is relatively unique in Australia, treating a wide range of varying raw water qualities.

The water treatment processes include pre and post chlorine in conjunction with ultraviolet disinfection for control of *Naegleria fowleri* and pathogens. Potassium permanganate is added for iron and manganese removal. Enhanced powdered activated carbon contact (PAC) is used for dissolved organics, toxins and taste and odour removal. Sulphuric acid is used for optimal flocculation pH. Aluminium sulphate (alum) is added as the primary coagulant with polyacrylamide or PolyDADMAC as a flocculant aid.

Water is then delivered to a three-parallel train, two-stage flocculation and clarification process. The settled water is polished via dual media filters where polyacrylamide can be added as a filter aid. The

filter backwash process includes both air scour and water. A Reverse Osmosis (RO) plant is integrated into the plant as a side stream process to control salinity and hardness when required. Fluoride is added to meet health standards. Lime is used for final pH correction, followed by the addition of post chlorine to ensure residual chlorine levels at the extremities of the reticulation system comply with the Australian Drinking Water Guidelines.

The treated water is stored at Mica Street WTP and then pumped to service reservoirs located at Block 10 (which services Central and South Broken Hill) and Wyman and Rocky Hill (which services North and West Broken Hill).

The Menindee water treatment plant uses a similar process, with the exception of the use of polyelectrolyte as a flocculation enhancer and ultraviolet disinfection.

Sunset Strip is currently supplied with non-potable water. Raw water is taken off the Menindee to Kinalung pipeline. A micro-filtration process takes place with a filter of 0.2 microns. The raw water then passes through a carbon filter and is chlorinated and distributed to local residents.

Several investigations have been undertaken to make the Sunset Strip water supply potable. Unfortunately, the plant is expensive to operate and would require significant capital expenditure to make the plant potable, which would further add to the operating cost and place greater pressure on customer prices. Essential Water plans to decommission this plant and supply treated water from Menindee to Sunset Strip. This proposal is contingent on Government funding for a small pipeline from Menindee to Sunset Strip, in conjunction with consequential works associated with the Wentworth to Broken Hill pipeline.

Silverton is also currently supplied with non-potable water. Raw water is taken off the Umberumberka to Broken Hill pipeline, chlorinated and then distributed to local residents.

#### Sewerage reticulation

Sewerage reticulation is divided into two zones, north and south of the Broken Hill 'Line of Lode'. Due to the topography of the city, the northern network feeds a major pumping station at Warren Street, the low point in the city, via a number of pumping stations. Sewerage needs to be pumped away from Warren Street across town to the Wills Street treatment plant. (The treatment plant could not be located at Warren Street, because of the risk of effluent draining into the Imperial Lake and Stephens Creek reservoirs.)

The network of pipes is very old, constructed mostly of clay, and in poor condition. The pipes need to be frequently scoured because they become blocked with roots and debris. Due to the topography and rocky nature of the ground, when the network was first constructed most of the pipes were installed along the shortest route through properties. The condition of the network in the southern part of the city is similar.

#### Sewerage treatment

There are two wastewater treatment plants in Broken Hill. Wastewater is reticulated from individual properties through approximately 20 kilometres of rising mains and 175 kilometres of gravitation mains to 11 sewerage pumping stations in Broken Hill, and then to either the Wills Street or South Broken Hill wastewater treatment plant. Both plants utilise conventional anaerobic trickling filters. Wills Street treats 3 ML of influent per day, and South Broken Hill treats 0.8 ML of influent per day.

Treated effluent water use is almost fully allocated, with recycled water customers taking almost all of the water. A minimal amount is discharged to the environment under our operating licence approvals.

## 2.3 Services provided by Essential Water

Table 3-1 outlines the water and sewerage services provided by Essential Water.

**Table 3-1: Water and sewerage services provided by Essential Water**

| Water Service | Description |
|---|---|
| Treated water | Treated water is commonly known as 'potable' or drinking water. Water is disinfected and filtered to a standard that is fit for human consumption. The disinfection process is designed to kill most microorganisms in the water, including all pathogenic (disease-causing) bacteria. There are several ways to disinfect, with chlorine being the most frequently used in water treatment.<br>Treated water is available in Broken Hill and Menindee. |
| Untreated water | Untreated water is also referred to as 'raw' water. This is water in its natural state, prior to any treatment process, and is the water entering the first treatment process of a water treatment plant. It is not suitable for human consumption.<br>Untreated water is available in selected locations of Broken Hill and Menindee, and to customers along the Menindee, Stephens Creek and Umberumberka pipelines. |
| Chlorinated water | Chlorinated water is raw water that has been treated with a chlorine disinfection process, but not filtered to remove solids and organic particles. This water is not suitable for human consumption. Chlorinated water is available in Silverton. |
| Effluent water | Effluent water is 'sewage' or 'recycled' water that is treated at a sewerage treatment plant before being re-used or discharged to the environment. Effluent water is not suitable for human consumption and may only be re-used under specific environmental conditions. |
| Sewerage services | Essential Water provides sewerage services to the city of Broken Hill only. A small number of properties in Broken Hill do not have access to sewerage services.<br>Essential Water operates two sewerage treatment plants. Almost all non-potable treated effluent is used by recycled water customers. A small percentage is released to the environment. |
| Liquid trade waste and miscellaneous services | Essential Water provides liquid trade waste services to non-residential customers in the city of Broken Hill only. Charges are levied based on the category of trade waste customer, dependent on the type and level of discharge of identified trade waste into the sewerage system.<br>Categories of liquid trade waste customers are determined on the basis of criteria set by the NSW Office of Water's 'NSW Liquid Trade Waste Regulation Guidelines 2009'. This regulation gives Essential Water powers to undertake essential infrastructure works by allowing Essential Water to be a determining authority under Part 5.<br>Liquid trade waste and miscellaneous services are outlined below. |

All the above services are regulated by IPART, with the exception of effluent (or recycled) water, as this became an unregulated service at the 2014 determination. More detail on this is provided in Chapter 12 'Tariff structures and price path' (Section 7 'Recycled water pricing').

## 2.4 Liquid trade waste services

As indicated in Table 3-1 above, Essential Water only provides liquid trade waste services to non-residential customers in the city of Broken Hill. Charges are levied based on the category of trade waste customer, dependent on the type and level of discharge of identified trade waste into the sewerage system.

Determination of categories of liquid trade waste customers is on the basis of classification criteria set by the NSW Office of Water's *NSW Liquid Trade Waste Regulation Guidelines, 2009*. Liquid trade waste services and accompanying charges may include the following:

- **Application fee**

  Recovers the cost of services provided in processing applications for approval to discharge liquid trade waste. The fee is applied on application, renewal or change of ownership.

- **Annual trade waste fee**

  Recovers the costs of administration and scheduled inspections each year to ensure trade waste customers' ongoing compliance with the conditions of their discharge approval. More complex individual customers may require monitoring of their discharge and these fees are based on full cost recovery. The annual trade waste fee is levied based on the category of trade waste customer and is proportionate to the complexity of their inspection and administrative requirements.

- **Re-inspection fee**

  Where non-compliance with the conditions of an approval has been detected and the discharger is required to address the issues identified, a re-inspection of the customer's premises may be required to confirm compliance. The re-inspection fee is charged for each customer site visit.

- **Trade waste usage charge**

  Where certain categories of customers have not installed and maintained appropriate pre-treatment facilities, a non-compliant trade waste usage charge can be levied.

  The trade waste usage charge is imposed to recover the additional cost of transporting and treating liquid trade waste from Category 2 dischargers. Category 2 dischargers who have not installed and maintained appropriate pre-treatment facilities will be required to pay a non-compliant trade waste usage charge.

- **Excess mass charge**

  Will apply for substances discharged in excess of the deemed concentrations in domestic sewage. Excess mass charges apply to Category 3 dischargers only and are based upon the results of monitoring of their trade waste discharge.

- **Food waste disposal charge**

  Applies to existing installations of food waste disposal units where their installation is approved. Where Essential Water has permitted the use of a food waste disposal unit for an existing hospital, nursing home or other eligible facility, a food waste disposal charge will be payable annually. The fee is based upon the number of beds in the hospital or nursing home multiplied by an annual charging rate per bed.

- **Non-compliance excess mass charge**

  A charge will apply where a Category 3 discharger fails to comply with the approved concentration limits of substances specified in the customer's approval conditions. Where a discharge quality fails to comply with the approved concentration limits of substances specified in Essential Water's approval conditions (or the acceptance criterion listed in Essential Water's trade waste policy), Essential Water incurs additional costs in accepting and treating that waste. In order to cover Essential Water's costs, non-compliance excess mass charges will apply. This is a usage charge and is particular to individual customers based upon the results of monitoring of their trade waste discharge.

- **Non-compliance penalty**

  Covers instances where compensation to recover the cost of legal action, damage to infrastructure, incurred fees or other matters resulting from illegal, prohibited or unapproved liquid trade waste discharged into the sewerage system.

## 2.5 Miscellaneous services

A range of miscellaneous services are offered to customers, generally for one-off services including, but not limited to:

- connections and disconnections,
- replacing damaged services,
- plumbing inspections,
- site inspections, and
- building plan approvals.

These charges are levied to a relatively small number of customers and are based on the cost of the service provided.

Charges for liquid trade waste services and miscellaneous services are discussed in Chapter 12 'Tariffs and Price Path'.

# 3 PERFORMANCE OVER THE 2014 DETERMINATION PERIOD

## 3.1 Service levels over the 2014 determination period

Essential Water strives to meet all industry standards required of a water utility. State and national performance monitoring provides benchmarking against other urban water utilities in both metropolitan and regional centres. Essential Water measures customer service levels against a number of key indicators.

### Customer complaints and enquiries

Essential Water aims to respond to at least **95 per cent of customer complaints and enquiries within four days** of receipt. This target was met in all cases for the last regulatory period. During the current determination period, Essential Water received twenty formal complaints or enquires that had been lodged with the Energy and Water Ombudsmen (EWON). All complaints have been successfully resolved.

### Other customer related service standards

Additional Essential Water customer-related service standards are:

- **notice periods** - commercial customers or occupiers that will have their supply, service or access affected must be given minimum notice of seven days or as agreed with each individual customer. Residential customers are given notice of two days,
- **duration of interruptions** - maximum duration of planned interruptions in Broken Hill is four hours for most works, with seven hours for mains replacement. Other areas have a maximum duration of planned interruptions of six hours,
- **maximum number of interruptions** - two per customer per year (excludes mains construction as interruption occurs daily until the replacement is complete), and
- **billing related enquiries** - responded to during business hours the same day.

Further information regarding customer service standards and compliance over the current determination period is provided in Section 3.2.

We are not proposing to change the customer service standards for the 2019-23 regulatory period.

As illustrated below, Essential Water has met or exceeded its customer service standard obligations over the 2014 regulatory period.

## 3.2 Customer service standards

**Table 3-2: Customer service standards - water**

| Water | Criteria | Past performance | Future performance | Performance gaps |
|---|---|---|---|---|
| **Availability of water supply** | • Minimum pressure of 15 metres head of water in the reticulation system, conveying six litres per minute per residential connection under normal conditions. | • Pressure is adequately maintained by management of tank levels in Broken Hill. No poor pressure complaints in Broken Hill during last 12 months. Operational procedures in place to maintain pressure. Ongoing monitoring of tank levels by way of telemetry. | • Continued adherence to operation procedures. | • No identified gaps. |
| | • Water restrictions should not be applied more than five per cent of the time. | • Implementation of a drought management plan with two years of restriction due to sustained drought, ending December 2016. | • Agreed seasonal supply availability with WaterNSW and backup Stephens Creek Reservoir. | • Non-conformance due to sustained drought. |
| | • 3,000L/tenement/per day for residential potable water – (four-month peak season). | • Target Monitored by Dashboard metric local reservoir volumes.<br>• New developments are required to obtain statements of available pressure to ensure criteria are being met. | • Continued requirement to obtain statement of available pressure.<br>• The new Wentworth to Broken Hill pipeline should improve both the reliability of supply and water quality. | • No identified gaps. |
| | • Planned works: residential customers two days written notice, non-residential seven days' written notice. | • Procedures in place to ensure adequate notification protocols are adhered to. | • Continued adherence to operational procedures. | |

| Water | Criteria | Past performance | Future performance | Performance gaps |
|---|---|---|---|---|
| | • Water will be available from reticulation fire hydrants for fire-fighting at minimum flow rates determined by guidelines. | • Active fire hydrant maintenance and replacement programme – 108 hydrants maintained YTD 2017-18. | • Continued fire hydrant maintenance program. | • No identified gaps.<br><br>• No identified gaps. |
| **Water quality** | • Potable water supply should meet Australian Drinking Water Guidelines.<br><br>• Non-potable water supply should meet public health standards with respect to bacteria, contaminants and pathogens, consistent with its use.<br><br>• Recycled water supply should meet Australian Guidelines for Water Recycling, Managing Health and Environmental Risks 2006. | • 100 per cent compliance for health-related criteria. Monitored by Dashboard metric water quality breaches.<br><br>• See water quality reports located at: http://www.essentialwater.com.au/content/water-quality-reports.<br><br>• See water quality reports located at: http://www.essentialwater.com.au/content/water-quality-reports. | • Strictly adhering to Australian Drinking Water Guidelines, incorporating changes as required<br><br>• Adhering to Australian Guidelines for Water Recycling, Managing Health and Environmental Risks, incorporating changes as required.<br><br>• The new Wentworth to Broken Hill pipeline should improve both the reliability of supply and water quality. | • No identified gaps.<br><br>• Management plans in place. |

| Water | Criteria | Past performance | Future performance | Performance gaps |
|---|---|---|---|---|
| | | | | |
| **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:<br>– 30 minutes (business hours)<br>– one hour (after hours).<br>• 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:<br>– one hour (business hours)<br>– two hours (after hours)<br>• Priority 3 -defined as failure to maintain continuity or quality of supply to a single customer. Response time:<br>o one working day<br>• 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:<br>✓ Within two weeks | • Performance not measured on a job-by-job basis.<br>• Anecdotal evidence that service response times are effective.<br>• Customer survey completed in 2018 found that customers are generally satisfied with Essential Water's service provision, with reliability of supply ranking 67 per cent for its water service and 91 per cent for its sewerage services. | • Not measured on an individual basis at this stage.<br>• Periodic customer surveys. | • Procedure implemented to ensure response times are appropriately measured in an appropriate system. |
| **Customer complaints** | • Customer complaints other than supply failure:<br>✓ Respond to 95 per cent of written complaints or enquiries within four working | • There was only one customer complaint in 2017 of itchiness due to chlorine in the water. However, the complaint was also associated with a medical condition. | • Ongoing monitoring through Dashboard to ensure criteria is being met. | • No gaps identified. |

| Water | Criteria | Past performance | Future performance | Performance gaps |
|---|---|---|---|---|
| | days of receipt.<br>✓ Respond to 95 per cent of personal complaints or enquiries within four working days. | | | |

**Table 3-3: Customer service standards - sewerage**

| Sewerage | Criteria | Past Performance | Future Performance | Performance Gaps |
|---|---|---|---|---|
| **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.<br>• Acceptance of commercial and industrial wastes (trade waste) should be in accordance with approval conditions for each discharger. | • Sewer reticulation system established and maintained within Broken Hill service area.<br>• Trade Waste Policy lodged with Office of Water.<br>• Commercial customers have been assessed, 45 businesses registered as trade waste customers that do discharge to sewer, and eight businesses are under a trade waste agreement. | • New developments in Broken Hill are required to pay a capital contribution if outside the current service area.<br>• All commercial customers to be on a trade waste agreement.<br>• Future implementation of trade waste charges. | • No identified gaps. |
| **Average system failures** | • Controlled, expected (overflow structure) - related to rainfall and | • Overflows manually recorded but not actively monitored apart from yearly report to NSW Environment Protection | • Ongoing reporting to the NSW Environment | • Increased asset condition assessment |

| | | | | |
|---|---|---|---|---|
| | design:<br>✓ Not more than two times in one year on average.<br>• Controlled, unexpected (flow relief structure):<br>✓ Not more than once in five years.<br>• Uncontrolled, unexpected:<br>✓ Private property: not more than 50 per 1000 properties per year.<br>✓ Public property - sensitive areas: not more than once per three years.<br>✓ Public property - elsewhere: not more than once per 10 kilometres of main per year. | Authority<br>• 2016/17 licence return reported 0 wet weather overflows, 0 dry weather overflows, and 592 chokes.<br>• Monitoring by Dashboard metric sewer mains rodded, which directly impacts on the number of overflows and chokes YTD 2017/18 favourable to target 1 per cent. | Protection Authority.<br>• Ensure sewer main rodding Dashboard targets are being met. | and potential implementation of a Sewer Reticulation Renewal Program. |
| **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:<br>✓ 30 minutes (working hours)<br>✓ one hour (after hours)<br>• 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>✓ one hour (working hours)<br>✓ two hours (after hours)<br>• Priority 3 - defined as 'minor failure to contain sewage affecting a single property or as bad odours'. Response time: | • Performance not measured on a job by job basis.<br>• Anecdotal evidence that service response times are effective, by no formal customer complaints being received YTD 2017/18.<br>• Customer survey completed in 2018 found that average restoration to service following planned interruptions of 61 per cent and following an emergency of 56.5 per cent was reasonable. | • Not measured on an individual basis at this stage.<br>• Periodic customer surveys. | • Procedure implemented to ensure response times are appropriately measured in an appropriate system. |

| | | | | |
|---|---|---|---|---|
| | ✓ next working day | | | |
| **Customer complaints** | • Respond to 95 per cent of written complaints or enquiries within four working days of receipt.<br>• Respond to 95 per cent of personal complaints or enquiries within four working days. | • In accordance with Dashboard metric average complaint resolution time. YTD 2017/18 is 100 per cent. | • Ongoing monitoring through Dashboard to ensure criteria is being met. | • No gaps identified. |
| **Odours/vectors** | • Not more than two incidents per year that result in complaints. | • Monitoring by way of Dashboard metric environmental compliance. No formal complaints YTD 2017/18 received regarding odour. | • Ongoing monitoring by Dashboard. | • No gaps identified. |
| **Impact of sewerage treatment plants** | • The maximum level of noise should not be more than 5 dB above the background noise level.<br>• Odour should not be detectable outside the utility's buffer zone around the treatment works. | • Monitoring by way of Dashboard metric environmental compliance. No formal complaints YTD 2017/18 received regarding odour or noise. | • Ongoing monitoring by Dashboard. | • No gaps identified. |
| **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. | • Non-compliant for pH on the annual licence requirements over the past number of years | • Ongoing reporting to the NSW Environment Protection Authority. Actively managing non-compliances for effluent discharge. | • Essential Water is planning to replace the Wills Street treatment plant in the next determination period. This should result in improved compliance with regulation and environmental standards. |

# 4 WATER QUALITY

Essential Water complies with the Australian Drinking Water Guidelines (ADWG) as detailed in Table 3-4 below.

**Table 3-4: Broken Hill drinking water quality 1 January 2015 to 31 December 2017**

| BROKEN HILL Characteristics | | ADWG Target | Filtered water compliance | | |
|---|---|---|---|---|---|
| | | | 2015 | 2016 | 2017 |
| Health | E. coli | 0 orgs / 100 mL (100 per cent) | 100 per cent | 100 per cent | 100 per cent |
| | Fluoride | 0.9 to1.5 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Free Chlorine | 0.2 to 5 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Lead | <0.01 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Arsenic | <0.01 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Manganese | <0.5 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Cadmium | <0.002 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Copper | < 2 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Mercury | <0.001 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Trihalomethanes | <0.25 mg/L | 100 per cent | 100 per cent | 100 per cent |
| Aesthetic | Turbidity | < 5 NTU | 100 per cent | 100 per cent | 100 per cent |
| | True Colour | 15 HU | 100 per cent | 100 per cent | 100 per cent |
| | pH | pH 6.5-8.5 | 100 per cent | 100 per cent | 100 per cent |
| | EC | <1090 µS/cm | 100 per cent | 75 per cent* | 100 per cent |
| | Zinc | <0.3 mg/L | 100 per cent | 100 per cent | 100 per cent |
| | Iron | < 3 mg/L | 100 per cent | 100 per cent | 100 per cent |

*Still complies with ADWG

## 4.1 Availability of water supply

As the result of a third severe drought since 2003 and continuing emergency drought project funding by the NSW Government, the need to adequately secure the bulk water supply to Broken Hill was recognised during the current regulatory period. As discussed in Chapter 2 ‘Context and Background’, in June 2016, then NSW Premier Mike Baird announced funding to secure bulk water supply to Broken Hill from the Murray River near Wentworth. The project is due for completion in April 2019.

The drought, which saw local reservoirs dry and Menindee Lake draw down to less than three per cent capacity, required Broken Hill and surrounding communities to be placed on water restrictions from December 2014 until December 2016.

# 5 LEGISLATIVE FRAMEWORK

Table 3-5 summarises the regulatory bodies that oversee Essential Water's water and sewerage functions. Table 3-6 outlines the main legislation that applies to Essential Water's activities.

**Table 3-5: Essential Water's primary regulators and their responsibilities**

| Regulator | Responsibility |
|---|---|
| **IPART** | Responsible for setting the maximum prices that can be charged by Essential Water for its monopoly services.<br><br>In the 2010 Determination, IPART did not determine prices for water supply services provided to the mining companies (of which Perilya accounts for 80 per cent of consumption), as prices were set by the NSW Government under a separate agreement that expired on 30 June 2012. It has since been agreed that prices for the mines will be included in the IPART determination for the regulatory period starting 1 July 2014. |
| **The Department of Primary Industries (DPI)** | Through the NSW Office of Water (NOW), the DPI has primary responsibility for the management of water resources throughout NSW. NOW licences the extraction of water from surface and groundwater sources under the *Water Management Act 2000* and the *Water Act 1912*. NOW also oversees the performance of local water utilities using a 'light handed regulatory framework', based on the requirements of the 'Best-Practice Management of Water Supply and Sewerage Guidelines'. |
| | Through the Dams Safety Committee, the DPI is responsible for formulating measures to ensure the safety of dams, and maintaining surveillance of prescribed dams, including those under the management of Essential Water. This function is conducted under the *Dams Safety Act 1978*. |
| **NSW Health** | Responsible for regulating the quality and safety of Essential Water's drinking water. |
| **Office of Environment and Heritage** | Responsible for monitoring and regulating sewage discharges from Essential Water's sewerage system. |

**Table 3-6: Main legislation that applies to Essential Water's activities**

| Legislation | Description |
|---|---|
| Water Management Act 2000 | Regulates water utilities, outlines functions of both water and sewer services/infrastructure, creates special areas, provides for Water Access Licences to be issued, legislates area of operations, allows levying of service charges and enforcement proceedings. |
| Water Management (General) Regulation 2011 | Categorises Water Access Licences, provides detailed powers for sewerage and water, and provides functions of special areas, service charges, pensioner concessions and penalty notice offences. |
| Dam Safety Act 1978 | Constitutes the Dam Safety Committee that is tasked with surveillance, investigation and formulation of measures to ensure the safety of prescribed dams. |
| Protection of the Environment Operations Act 1997 | Regulates wastewater treatment plants that are under an Environmental Protection Licence. The Act imposes significant regulatory constraints on Essential Water operations, which include potential penalties in the event of a pollution incident. |
| Fluoridation of the Water Supplies Act 1957 | Creation of the Fluoridation of Public Water Supplies Advisory Committee, which makes proposals for the addition of fluoride to public water supplies. The Committee also enforces the continuation of fluoridation and associated penalties |
| Environmental Planning and Assessment Act 1979 | This Act gives Essential Water powers to undertake essential infrastructure works by allowing Essential Water to be a determining authority under Part 5. |
| State Environment Planning Policy (Infrastructure) 2007 | Allows effective delivery of water and sewerage infrastructure and outlines what development is permitted with or without consent. |
| Public Health Act 2010 and Public Health Regulation 2012 | Legislates measures to ensure drinking water safety and determines penalties in the event of non-compliance. Also governs compliance with the Australian Drinking Water guidelines. |

# 6 SERVICE STANDARDS FOR THE UPCOMING REGULATORY PERIOD

Essential Water will provide services in accordance with the following service standards.

## 6.1 Water supply and quality

A stringent regime of testing and quality assurance ensures Essential Water meets Australian Drinking Water Guidelines set by the National Health and Medical Research Council and the Agriculture and Resource Management Council of Australia and New Zealand. The testing process includes taking water samples from 38 locations including reservoirs, at the inlet and outlet of water filtration plants and from various other locations throughout the water network.

Testing is conducted by the Australian Water Quality Centre and the Department of Analytical Laboratories (independent laboratories certified to the National Association Testing Authority

Standards). NSW Health reviews the results. This strict water quality testing ensures Australian Drinking Water Guidelines are met.

Each year, Essential Water publishes a summary of test results for samples collected over the previous 12 months, outlining health and key aesthetic characteristics that have been selected in consultation with NSW Health. The results are also issued annually in a brochure sent to customers with their water accounts.

Water quality test results for 1 January 2015 to 31 December 2017 indicated that drinking water quality had complied with all health (and aesthetic other than for salinity) related guideline values, in accordance with the Australian Drinking Water Guidelines 2013 (see Table 3.2). Essential Water also undertakes public reporting of test results which are published on our website every three months.

## 6.2 Service standards and performance monitoring

Essential Water strives to meet industry standards for a water utility business. State and national performance monitoring provides benchmarking against other urban water utilities, both metropolitan and regional centres. While Essential Water currently operates in unique conditions, such as being 116 kilometres from the primary water source (and soon to be 270 kilometres away), industry benchmarking does provide opportunities for performance comparison. Changes to levels of service that may arise as a result of the new bulk water supply will be reviewed once the new pipeline is in operation.

## 6.3 Best practice management of water supply and sewerage services

Essential Water complies with the six criteria set by the NSW Government for the best practice management of water supply and sewerage services. Best practice management helps to ensure the effective and efficient delivery of services and promote sustainable water practices and demand management.

The six criteria for best practice management are:

- strategic business planning,
- pricing,
- water conservation,
- drought management,
- performance reporting, and
- integrated water cycle management

Essential Water is in the process of reviewing some of the key criteria for best practice management. Over the coming regulatory period, key business documents including strategic business plans, internal and external performance reporting, demand management and drought management will be regularly reviewed and updated.

Public Works Advisory is assisting Essential Water to complete its current Integrated Water Cycle Management process.

## 6.4 Customer service standards

Refer to Section 3 for Customer service standards and performance results.

# Chapter 4 – Customer engagement

# 1 OUR CUSTOMER ENGAGEMENT

## 1.1 Our customer engagement approach

Essential Water developed a tailored engagement program to ensure that we heard from a representative group of residential and business customers to gain insights into plans for our 2019-23 Water and Sewerage Pricing Submission.

Our engagement program was based on our Stakeholder Engagement Framework (Attachment 1) and was consistent with the criteria of the IPART Water Guidelines April 2018. Woolcott Research and Engagement facilitated independent research and analysis on Essential Water's behalf and modified our activities as we received feedback from customers and community members. A summary of the feedback we received is provided in Attachment 2 'Community Feedback Report'.

Our stakeholder engagement program is shaped by our key organisational values, and through being:

### Curious

Engaging early, to build respectful, inclusive, and collaborative relationships with our diverse stakeholders. Recognising that our stakeholders are diverse, we design our engagement activities to meet their needs, actively seeking feedback to learn and improve.

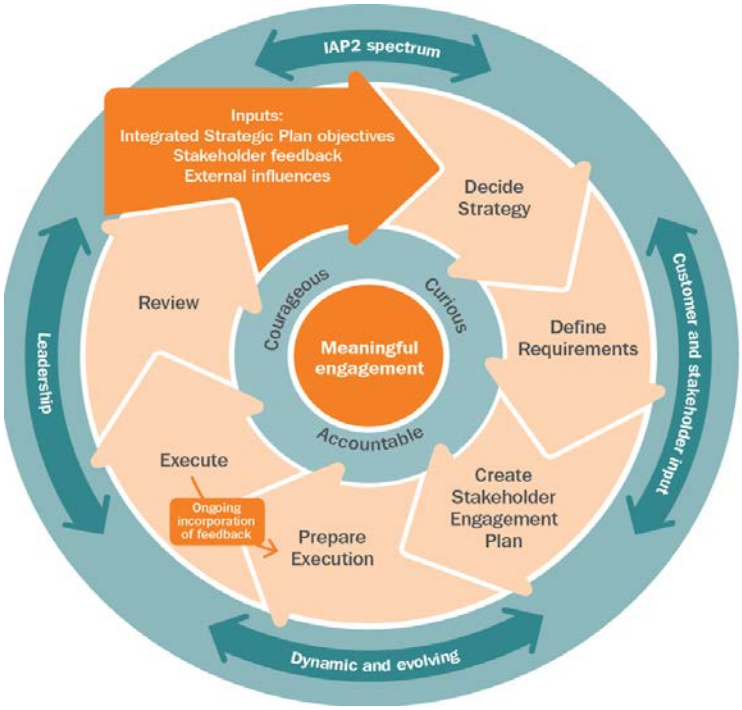
### Accountable

We are transparent, setting clear deliverables for measuring and evaluating the quality of our engagement. Outcomes are visible to stakeholders.

### Courageous

Action-orientated, open-minded and acting with integrity. Our business is continually informed and shaped by our engagement.

## 1.2 Our Stakeholder Engagement Framework



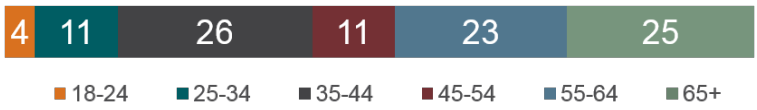
## 1.3 Customers we spoke to: Residential (400+)

### Gender

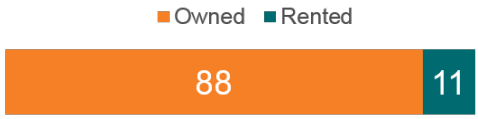
53%

47%

### Age %




### Owned or Rented %

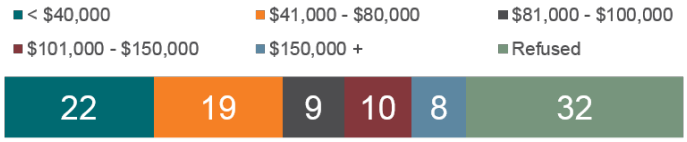



### Residence type

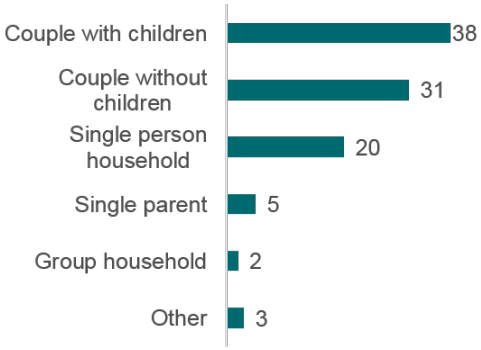
House 97%

Apartment 3%

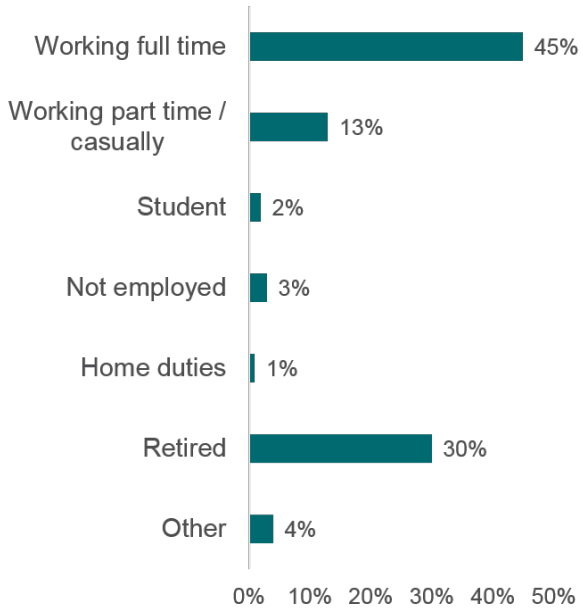
### Household Income %



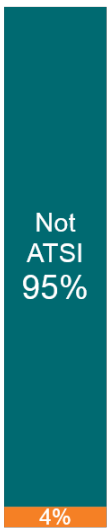

### Household Type %




### Work Status




### ATSI




### English at Home

## 1.4 Customers we spoke to: Business (100+)

### No. employees


### Gender

50%

50%

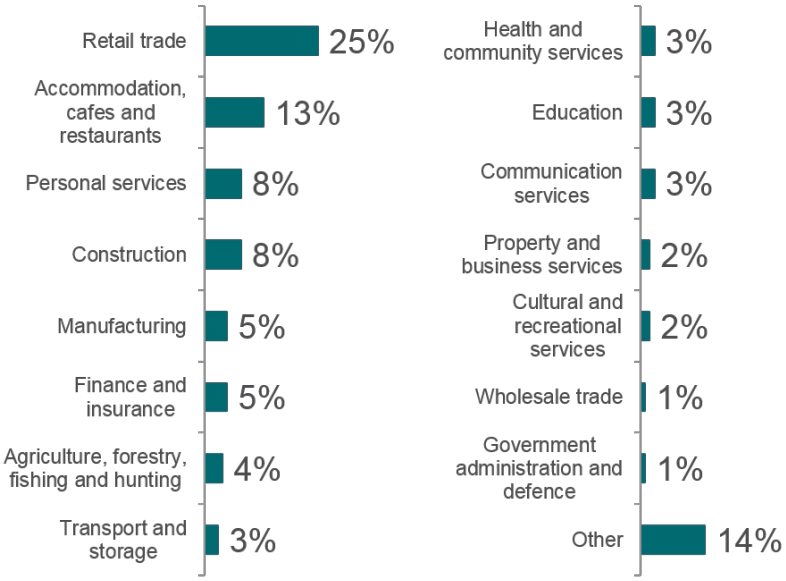
### Role

Owner/ Proprietor
**48%**

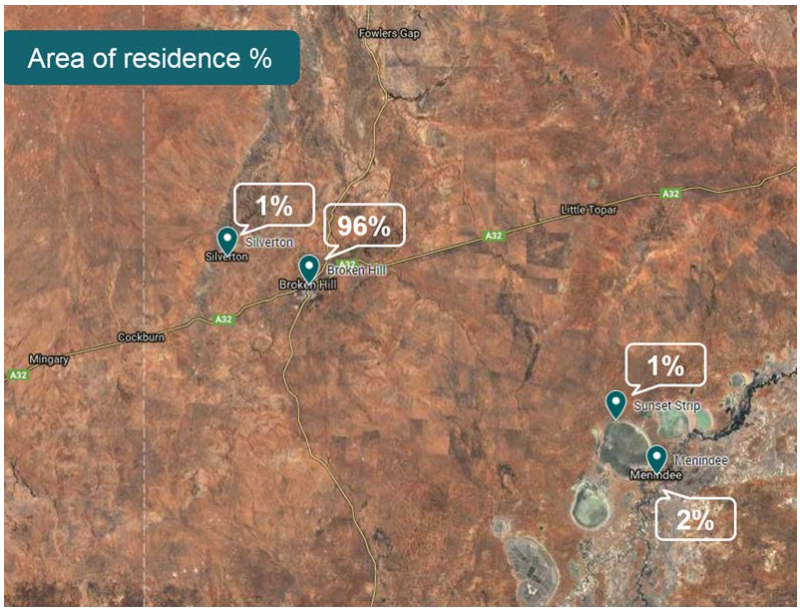
Senior Management
**26%**

Other Staff
**26%**

### Industry



## 1.5 Customer engagement area




## 1.6 How we engaged with customers

To share information and seek customers' feedback, we facilitated a range of engagement activities to encourage participation through the engagement channel they preferred.

**Survey**

> Over 400 residential customers and 100 business customers participated

**Online**

> Essential Engagement provided an online platform for customers to 'Have Your Say' and participate in the customer survey

**Meetings**

> Providing greater opportunity to deep dive into matters of key interest to customers

**Customer Council**

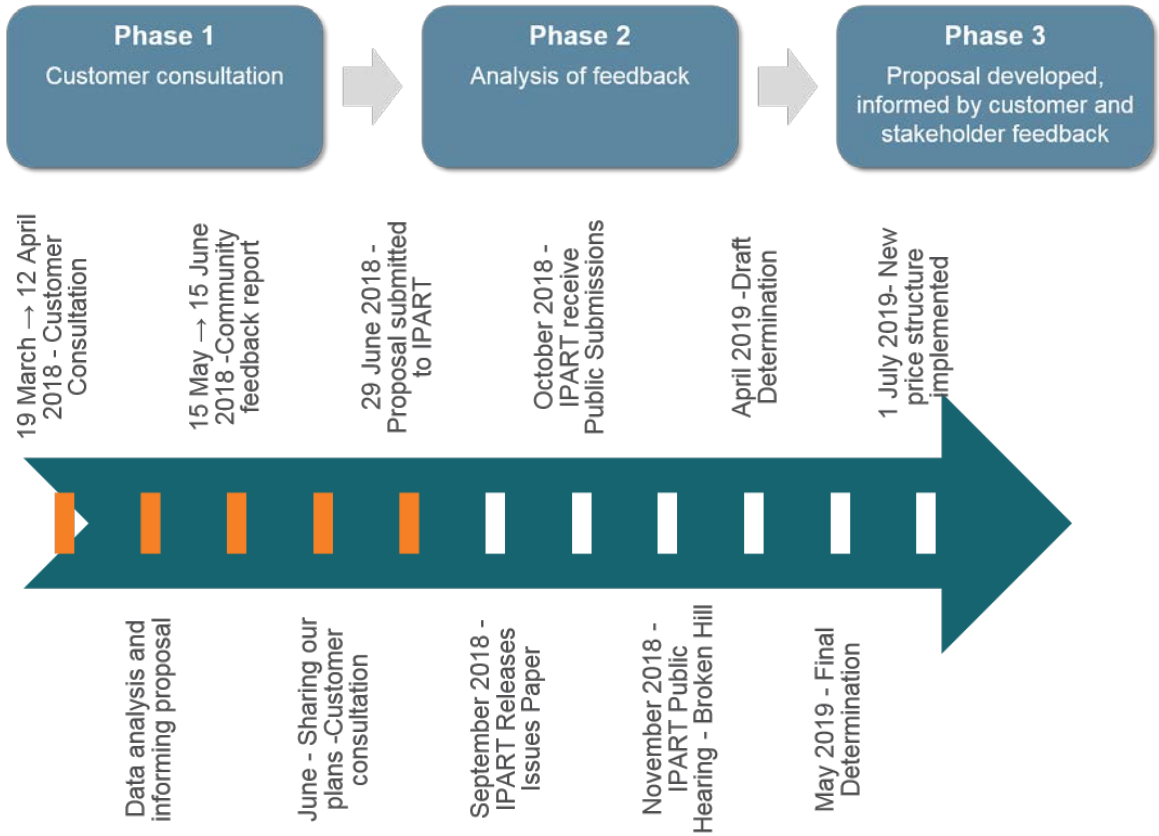
Essential Water's customer advisory group Representatives:

> Broken Hill City Council
> Broken Hill Health Council
> Menindee, Sunset Strip, Copi Hollow Representative
> Pastoralists Association of West Darling
> CBH Resources
> Broken Hill Chamber of Commerce
> Perilya Mines
> Business Customers

Our customer engagement is always on, with many platforms:

Essential Engagement | Email | Twitter | Facebook | Phone | Face to face | SMS | Website | Letters

## 1.7 Timeline of engagement activities




## 1.8 What we asked

Through our customer engagement program, we sought to understand what customers value and what improvements they would like from our current business activities. The feedback we received has informed our plans and decision-making processes, and the trade-offs that might be required to provide a safe and secure water supply.

Questions were framed around:

- Customer service – what does Essential Water do well?
- Customer service – what could be improved?
- Reliability and performance – how do you rate our service levels and interruptions?
- Pricing – can we make changes to our pricing structure?
- Water saving education – are customers interested in water saving tips?
- Communication with Essential Water – which method of communication suits customers?

## 1.9 Summary of engagement outcomes

The results of our customer survey are provided in Attachment 2 ‘Community Feedback Report’ and Attachment 3 ‘Essential Water Survey Report’. The table below summarises what we have heard and how it has influenced our 2019-2023 proposal.

| Topic | What customers told us | Our current regulatory framework | Changes we propose for 2019-2023 |
|---|---|---|---|
|  **Customer Service** | Customers are aware of Essential Water. Most customers believe we do a good job of maintaining water supply.<br>Water quality and affordability are the highest priority areas for improvement. | Industry benchmarking shows Essential Energy’s combined water and sewerage bill ranked 11th lowest out of 36 water utilities examined across NSW and Australia.<br>Our 72 FTE employees are committed to providing a safe, reliable, secure and efficient water supply and sewerage service to our customers. | We are focusing on efficiency and keeping costs down, despite a decreasing customer base and rising costs such as energy and chemical treatments.<br>We will maintain current service levels with reduced staff through efficiencies and natural attrition.<br>See Chapter 3 ‘Service standards’ and Chapter 7 ‘Operating expenditure’. |
|  **Reliability** | Our water and sewerage services are reliable.<br>Customers don’t want the current level of interruptions to change, even if the cost to their bill changes.<br>Water interruptions are restored in an acceptable timeframe. | Residential customers are provided with two days’ notice for planned outages; seven days for business customers.<br>The maximum duration of planned interruptions is four hours in Broken Hill, seven hours for mains replacement, and six hours for other areas.<br>There are two planned interruptions per year, excluding mains construction as interruption occurs daily until the replacement is complete.<br>Water and sewerage faults and emergencies are assessed to be responded to immediately, unless the fault is minor and | Investment in infrastructure is necessary to maintain current levels of reliability.<br>Essential Water will implement a preventative maintenance strategy, rather than breakdown maintenance, for its water assets.<br>See Chapter 3 ‘Service standards’, Chapter 6 'Capital expenditure' and Chapter 7 'Operating expenditure'. |

| Topic | What customers told us | Our current regulatory framework | Changes we propose for 2019-2023 |
|---|---|---|---|
| | | can be delayed until a crew is on shift or has been called in for another fault and emergency. | |
|  **Water Quality** | Customers rate water quality as an area for improvement.<br><br>Water needs to be clean, safe, and taste good. | Treated water is compliant with the Australian Drinking Water Guidelines.<br><br>Non-treated water meets public health standards with respect to bacteria, contaminants and pathogens, consistent with its use.<br><br>Recycled water meets Australian Guidelines for Water Recycling; Managing Health and Environmental Risks 2006. | The Wentworth to Broken Hill pipeline is expected to provide a better quality raw water source, improving all aspects of our water quality and treatment processes, mitigating the need to introduce emergency drought measures.<br><br>See Chapter 3 ‘Service standards’. |
|  **Price** | Affordability is an area for improvement. However, few customers are willing to pay less if it leads to more water interruptions.<br><br>Customers do not want to change the fixed/variable proportions of their bills.<br><br>Residential customers are unwilling to pay more to reduce the cost to small businesses, despite thinking ‘all customers should pay the same’.<br><br>Customers want the service charges for apartments to be the same as houses. | Our current pricing structure includes a fixed availability charge (about 2/3 of an average bill per quarter) and a variable usage charge (the remaining 1/3 of the bill).<br><br>Small business customers pay more than residential customers by about $115 a year for a similar sewerage service because they pay a sewerage usage charge that residential customers don’t pay. | We have included productivity improvements to ensure prices are based on efficient costs, such as installing solar power to reduce electricity costs.<br><br>We will maintain the current fixed / variable proportions of customers’ bills.<br><br>We will not restructure our tariffs to address the sewerage price difference between residential and business customers or to set different fixed availability charges for apartments and households.<br><br>See Chapter 12 ‘Tariff structures and price path’. |

| Topic | What customers told us | Our current regulatory framework | Changes we propose for 2019-2023 |
|---|---|---|---|
|  **Communication** | We provide customers with adequate warning in advance of a planned water interruption.<br><br>We could do better at keeping customers informed during an unplanned water interruption.<br><br>Telephone is the preferred method to contact Essential Water. | Essential Water's Customer Contact Centre is available 24/7 for customer enquiries. | Customers experiencing an unplanned or planned interruption can phone the Customer Contact Centre for updates.<br><br>To focus on keeping costs down, we will endeavour to contact customers impacted by an unplanned water interruption, but acknowledge that we cannot do so in all instances. |
|  **Education and engagement** | Surveys are a good way to obtain feedback from customers, and additional engagement programs are not required.<br><br>We should provide education in schools and within the community.<br><br>Few customers have visited our website for water saving tips. | Water and money saving tips are posted on Essential Water's website and posted in the newspaper from time to time.<br><br>Site tours are delivered to school groups. | We will continue to engage with the community outside of the regulatory approval process.<br><br>We will work with the community to educate on water and money saving tips and provide site tours as requested by schools and community groups. |
|  **Community & environment** | Having a community focus and environmental matters are of interest, but less of a priority to customers. | Delivery of our maintenance program ensures we meet environmental compliance.<br><br>We provide assistance and information to customers needing water for special purposes, such as dialysis.<br><br>We publish an annual Drinking Water Quality Report on our website to keep customers informed of the quality and quantity of their water supply. | Environmental sustainability will remain an area of focus. Our proposed $34 million Wills Street wastewater treatment plant replacement is important to ensure ongoing compliance with our environmental obligations.<br><br>Essential Water will implement a preventative maintenance strategy, rather than breakdown maintenance, for its water assets.<br><br>A full review of Essential Water's community support program is underway with the aim of providing more support to local communities.<br><br>See Chapter 3 'Service Standards', Chapter 6 'Capital expenditure' and Chapter 7 'Operating expenditure'. |

# 2 NEXT STEPS – ONGOING ENGAGEMENT

We will continue our customer-focused engagement approach beyond the IPART determination process. Our Stakeholder Engagement Framework (Attachment 1) guides our approach.

We will continue to apply the IPART customer engagement principles throughout the 2019-23 regulatory period:

*Principle: Relevant* – we listen to our customers and track complaint trends to identify the issues and deliver targeted engagement activities by ensuring we implement the right engagement mechanism to respond to the needs of the customer.

*Principle: Representative* – we will continue to work with and seek feedback from Essential Water's Customer Council, sharing project updates and seeking opinion on projects and initiatives that relate to our water business. Our engagement program for this proposal included ensuring we heard from a representative sample of the community and we will continue this approach throughout future engagement programs.

*Principle: Proportionate* – we heard from our customers that they are comfortable with the current level of engagement.[29] However, we will continue to provide an open channel of communication via phone, letters, face to face and digital channels.

*Principle: Objective* – we will identify opportunities for customers and stakeholders to be involved in decision-making and throughout the process be transparent, encourage dialogue and be open to alternative solutions. We will discuss honestly the flexibility of the outcome, as some outcomes may not be negotiable.

*Principle: Clearly communicated and accurate* – we will seek feedback on our communication materials to ensure the language and intent is understood. We will deliver our Stakeholder Engagement Framework which includes 'closing the loop' on engagement activities and providing feedback on how customer and stakeholder feedback informed business initiatives.

[29] When asked, 71 per cent of residential customers and 76 per cent of business customers were not interested in being involved in other customer engagement programs to help Essential Water in their business decision making process.

# Chapter 5 - Forecast sales and customer numbers

# 1 SUMMARY

This chapter sets out Essential Water's approach to forecasting sales and customer numbers for its water and sewerage services for the 2019-23 regulatory period. Sales forecasts are required for forecasting costs and revenues, and include:

- water volumes for cost forecasting and billed sales for usage charge setting,
- sewage volumes for cost forecasting and usage charge setting, and
- water and sewerage customer numbers for cost forecasting and access charge setting.

The forecasts provided in this chapter are used to convert the revenue requirements contained in Chapter 11 'Revenue requirements' into the tariffs set out in Chapter 12 'Tariff structures and price path'.

**Box 5-1: Key points**

Essential Water is forecasting the following growth rates for our water and sewerage services over the 2019-23 regulatory period:

- water and sewerage customer numbers to decline by 1 per cent per year, in line with the population trend,
- total water sales to decline by 0.4 per cent per year,
- treated water sales to decline by 0.4 per cent per year and chlorinated water sales to decline by 0.6 per cent per year,
- untreated water sales to remain flat, and
- billable sewerage volumes to remain flat.

We propose a Demand Volatility Adjustment Mechanism with a ± 5 per cent materiality threshold to minimise any incentive to under-estimate our customer number and volume forecasts, while at the same time accepting a reasonable level of forecasting risk.

Our forecast water and sewerage sales are provided in Table 5-1.

**Table 5-1: Forecast water sales and billable sewerage volumes**

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

Source: Essential Water analysis.

Our forecast water and sewerage customer numbers in Table 5-2.

**Table 5-2: Forecast water customer numbers**[30]

| Number of customers | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|---|
| Residential | 9,605 | 9,505 | 9,405 | 9,305 | 9,205 |
| Non-residential | 880 | 880 | 880 | 880 | 880 |
| **Total water customers** | **10,485** | **10,385** | **10,285** | **10,185** | **10,085** |

Source: Essential Water analysis.

**Table 5-3: Forecast sewerage customer numbers**

| Number of customers | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|---|
| Residential | 9,057 | 8,957 | 8,857 | 8,757 | 8,657 |
| Non-residential | 688 | 688 | 688 | 688 | 688 |
| **Total sewerage customers** | **9,745** | **9,645** | **9,545** | **9,445** | **9,345** |

Source: Essential Water analysis.

# 2 FORECAST CONSUMPTION

## 2.1 Introduction

The forecast sales of a water business play a pivotal role in the pricing process, as they determine how much of the total revenue will be recovered via usage prices for water and sewerage services. The usage charge and the forecast water sales for each water quality category determine the expected revenue from usage charges. The remainder of the revenue the business requires to provide water and sewerage services is recovered through fixed availability charges, derived by using forecasts of customer numbers.

It is important that the forecasts are reasonable. If they are materially higher or lower than Essential Water's actual water sales, customer numbers and chargeable wastewater volumes over the determination period, the determined prices will result in the business significantly over- or under-recovering its required revenue. If actual sales are lower than forecast sales, Essential Water will not earn sufficient revenues to recover its efficient costs. If actual sales are higher than forecast sales, the business will over-recover its efficient costs and customers will pay too much.

Over the current regulatory period, actual sales have been lower than the forecasts from the 2014 determination, resulting in Essential Water under-recovering its efficient costs.

### Background

The volume of water sales over a four-year regulatory period cannot be determined in advance with precision. In the 2014 regulatory period, low storage levels resulted in the imposition of temporary water restrictions for approximately two years. This contributed to Essential Water not being in a position to supply water volumes at the levels allowed by IPART in the current 2014 determination. The revenue effects of this shortfall are discussed in Chapter 2 'Form of regulation' in relation to a demand volatility adjustment mechanism.

As a result of new bulk water supply arrangements from the Wentworth to Broken Hill pipeline, with bulk water to be provided by WaterNSW from early 2019, we expect that the potential for water restrictions in the Broken Hill region may be significantly reduced, but this cannot be assured.

[30] The customer numbers shown in Table 5.2 are the number of unique customers, irrespective of the number of water services they receive from Essential Water.

As outlined in Chapter 1 ‘Context and background’, rainfall is among the lowest of any region in NSW. Rainfall events will increase dam levels and our ability to supply water from our existing operations to meet customer demand, but will somewhat lessen the demand for purchased water, as rainfall will be used for watering lawns and gardens.

Accuracy of water consumption forecasts is impacted by a number of factors, the most important of which are short-term climatic conditions, which drive year-to-year variations in demand.

Other influences include the medium to longer-term impacts of changing customer consumption behaviour, changes in customer numbers and climate change. While these risks can be mitigated to some extent in our consumption forecasting, a regulatory forecasting model cannot eliminate forecasting risk, nor is it designed to do so.

Our demand model is not expected to exactly predict water sales for each year of the next regulatory period. Actual water sales volumes in the forecast period will depend on the actual weather patterns experienced, rather than those forecast. If the weather is hotter and drier than recent trends, water sales are likely to be higher than forecast. The converse is expected under cool and wet conditions.

Our demand forecasting model aims to produce mean (expected value) forecasts, which on average will result in the forecast recovery of our revenue allowance over the determination period.

## 2.2 Our forecasting methodology

Essential Water has used internal forecasting resources to develop the forecast for sales volumes and customer numbers for the upcoming determination period. Historical trends and analysis have been used, as well as socio-demographic and climate information published by government agencies such as the Australian Bureau of Statistics (ABS) and the Australian Bureau of Meteorology. The major driver of the forecast is decreasing population, offset slightly by higher residences with fewer occupants and lower average use.

In summary, our methodology for forecasting water and sewerage consumption includes the following steps:

- our starting point is our last available actual data for consumption and customer numbers (i.e. 2016-17),
- we forecast customer numbers for 2017-18 and 2018-19 (the last two years of the current regulatory period) and cross-check this with other relevant data, such as ABS data for population trends and assessments of new housing starts,
- we then forecast customer numbers for 2019-23 (the four years of the upcoming determination period) and cross-check this with other relevant information, including ABS data (as per Step 2 above),
- we forecast rainfall and temperatures based on climatic data from the Australian Bureau of Meteorology and base our forecasts on average conditions,
- we calculate a ratio of water usage per customer according to major customer categories and apply this to our forecast customer numbers,
- we identify the potential impacts of price elasticity (discussed below), and
- we cross-check the forecasts for reasonableness against recent trends.

It should be noted that water consumption is impacted by the weather and rainfall in particular, and therefore any consumption forecasts should be treated with some degree of caution.

This process enables us to identify an estimate of price elasticity for water sales through a well-established approach to address the expectation that demand will reduce as prices increase, and will increase as prices fall. Price elasticity measures the expected change in demand with a one-percentage point increase in water price (i.e. a negative number indicates demand will fall as prices rise).

While we have not included the potential effects of price elasticity in our forecasts, we note that IPART's past practice is to incorporate the effects in its determinations. Therefore, we propose that IPART adopt the following price elasticity factors approved as part of the Sydney Water 2016 determination[31] as reproduced in Table 5-4 below when issuing its draft and final determinations. The asymmetry adjustment in Table 5-4 reflects IPART's assumption that the expected demand response to a proposed price decrease is assumed to be 75 per cent of the expected demand response to a price increase.

**Table 5-4: Price elasticity factors approved by IPART in its Sydney Water 2016 determination.**

| Component | Elasticity for price increase | Asymmetry adjustment | Elasticity for price decrease |
|---|---|---|---|
| IPART Decision | | | |
| Single residential | -0.249 | 75 per cent | -0.186 |
| Multi-residential | -0.049 | 75 per cent | -0.037 |
| Non-residential | -0.264 | 75 per cent | -0.198 |

# 3 WATER SALES AND CUSTOMER NUMBER FORECASTS

Essential Water serves approximately 10,500 water customers who are forecast to collectively purchase 5,246 megalitres (ML) of water in 2017-18. The vast majority of water consumers are residential customers, using approximately 260 kilolitres (kL) of water per year. The residential volume market represents approximately 92 per cent of connections.

When comparing Broken Hill's water consumption on a per capita basis with similar utilities, it is worth noting that Broken Hill has:

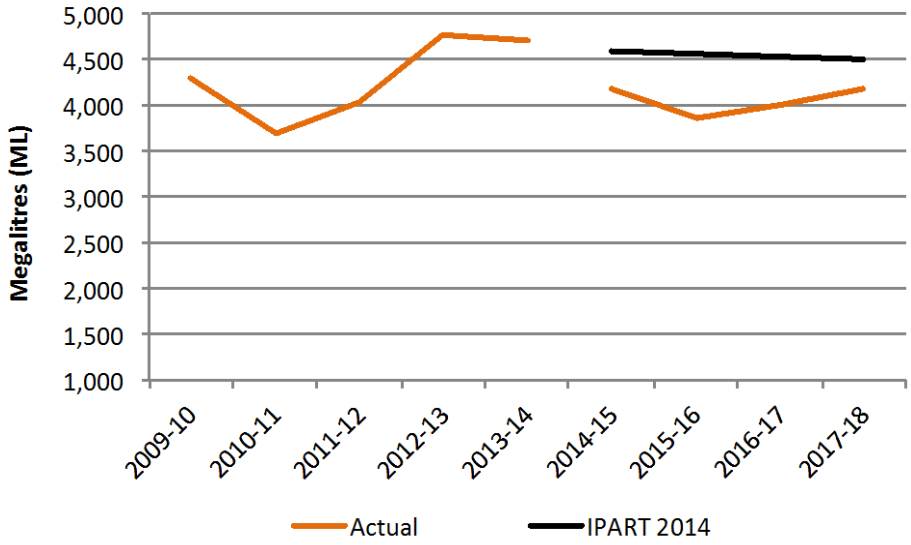
- its main water source over 116 kilometres away (270 kilometres away once the Wentworth to Broken Hill pipeline becomes operational),
- an arid climate with a low average annual rainfall over the past 126 years of 204 millimetres,
- a customer dependency on evaporative air cooling systems, and
- a strong message from environmental lead specialists promoting water use to assist in reducing lead levels.

## 3.1 Actual sales vs IPART forecasts for 2014-18

The following figure illustrates how actual water sales (treated water and chlorinated water, excluding mines sales) have tracked over the current determination period.

[31] IPART Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020 Water — Final Report June 2016. Table 8.2, Page 143.

**Figure 5-1: Actual sales vs IPART 2014 determination sales (excluding the mines)**




Source: Essential Water analysis.

Note: Analysis includes treated water and chlorinated water and does not include untreated water (consistent with IPART's analysis in the 2014 determination[32]).

As illustrated above, actual water sales over the current regulatory period (2014-15 to 2016-17) are tracking **12 per cent below** IPART's allowed sales. Actual sales have declined by 5.2 per cent per year over the first three years of the 2014 determination period.

This has resulted in Essential Water not recovering its efficient costs through the tariffs set by IPART over the current regulatory period.

### Demand volatility adjustment mechanism

The significant shortfall in sales volumes has led to a material under-recovery of Essential Water's efficient costs over the current regulatory period. However, as discussed in section 6 of Chapter 2 'Form of regulation', and based on concerns over affordability, we propose that the demand volatility adjustment mechanism for the current regulatory period is not triggered at this time.

Essential Water proposes the continuation of the demand volatility adjustment mechanism for the 2019 determination to mitigate possible revenue over or under-recovery due to a material variation between the net level of actual water demand over the determination period and the forecast demand used in making the determination.

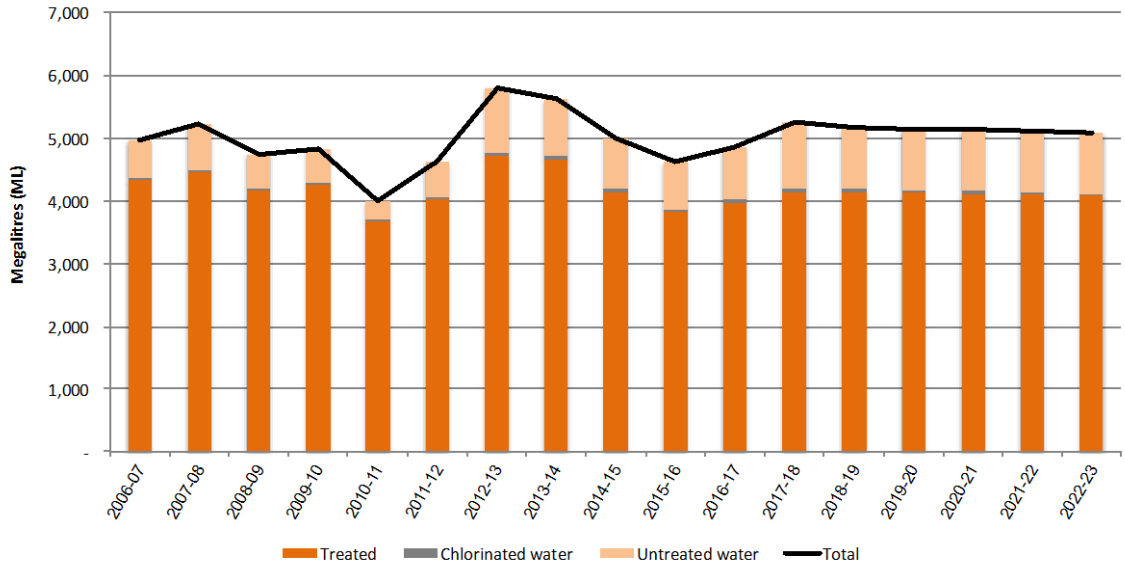
We have proposed a materiality threshold of ±5 per cent, consistent with recent Sydney Water 2016 determination. Our proposed mechanism for the 2019 determination is also discussed in Chapter 2 'Form of regulation'.

[32] See Table 8.2 of IPART's Essential Energy's water and sewerage services in Broken Hill Review of prices from 1 July 2014 to 30 June 2018 Water — Final Report June 2014. Page 102

## 3.2 Water sales forecasts for 2019-23

Figure 5-2 illustrates actual water sales from 2006-07 to 2016-17 and outlines our forecasts for the remainder of the current regulatory period (2017-18 and 2018-19) and the four years of the upcoming regulatory period commencing in 2019-20.

**Figure 5-2: Water sales (ML)**




Source: Essential Water analysis.

Over the first three years of the current regulatory period, from 1 July 2014 to 30 June 2017, total water sales have averaged 4,830 ML per annum. This period has been characterised by temporary water restrictions for two out of the three years. Essential Water is forecasting total water sales to be 5,092 ML in 2022-23, or a **decline of 13 per cent** from the high watermark of 5,821 ML in 2012-13, which was the last actual information available to IPART at the time of the 2014 determination.

We are forecasting total sales of 5,246 ML in 2017-18 and 5,167 ML in 2018-19, which are then forecast to decline by 0.4 per cent per annum from 2018-19 to 2022-23.

Table 5-5 outlines Essential Water's forecast water sales by customer type.

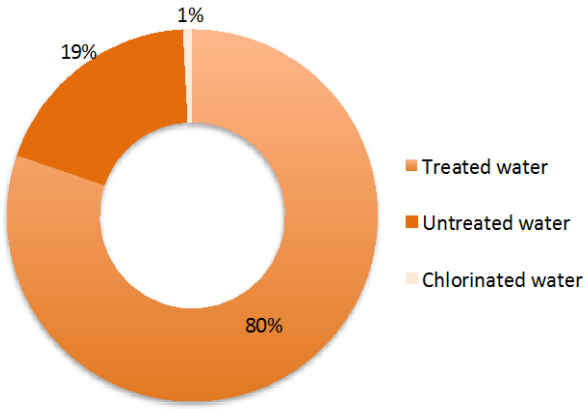
**Table 5-5: Forecast water sales by customer type**

| Consumption volumes (ML) | Forecast | | | | |
|---|---|---|---|---|---|
| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| **Treated water** | | | | | |
| Residential | 2,437 | 2,417 | 2,399 | 2,381 | 2,363 |
| Non-residential & mines | 1,428 | 1,428 | 1,428 | 1,428 | 1,428 |
| Exempt properties | 284 | 284 | 284 | 284 | 284 |
| **Total treated water** | **4,149** | **4,129** | **4,111** | **4,093** | **4,075** |
| **Chlorinated water** | **42** | **42** | **42** | **42** | **41** |
| **Untreated water** | | | | | |
| Non-residential & mines | 899 | 899 | 899 | 899 | 899 |
| Pipeline | 77 | 77 | 77 | 77 | 77 |
| **Total untreated water** | **976** | **976** | **976** | **976** | **976** |
| **Total water sales** | **5,167** | **5,147** | **5,129** | **5,111** | **5,092** |

Source: Essential Water analysis.

Treated water accounts for 80 per cent of total water sales, with untreated water accounting for 19 per cent and chlorinated water accounting for 1 per cent. This is shown in Figure 5-3.

**Figure 5-3: Forecast water sales volumes by type (2019-20)**




Source: Essential Water analysis.

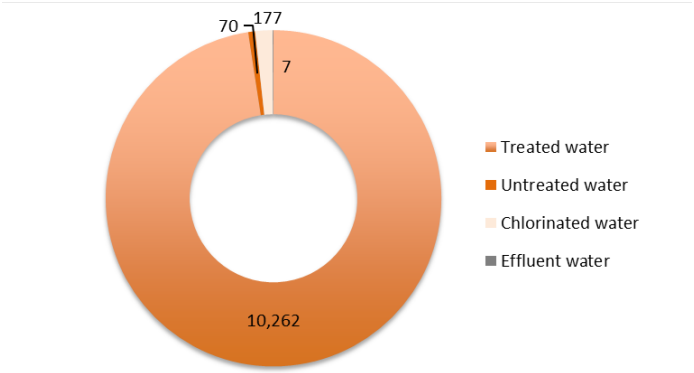
The split of water sales by type is not forecast to change significantly over the next regulatory period.

## 3.3 Customer number forecasts for 2019-23 – water

### Current customer numbers

As illustrated in Figure 5-4, approximately 10,500 customers currently receive their water supply from Essential Water.

**Figure 5-4: Actual customer numbers by water service type (2017-18)[33]**

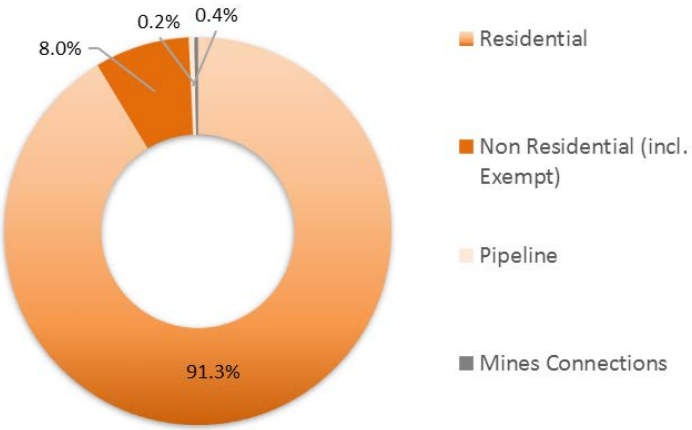



Source: Essential Water analysis.

Approximately 98 per cent of customers (10,262) receive treated water, while 0.7 per cent of customers (70) receive untreated water and 1.7 per cent (177) receive chlorinated water.

As illustrated in Figure 5-5, residential customers make up 91 per cent of our water customers.

**Figure 5-5: Water customers by category**




Source: Essential Water analysis.

Our two large mining customers have multiple water connections and account for almost a third of our total water sales, due to the application of IPART's mines pricing framework.

### Customer number forecast for 2019-23

Our customer number forecast for the proposed regulatory period is summarised below in Table 5-6 and forecast average water consumption data is shown in Table 5-7.

[33] The number of customers shown in Figure 5.4 reflects the fact that some customers have multiple water services. Essential Water has 10,485 unique water customers who receive a total of 10,516 water services.

Due to the declining population in Broken Hill, customer numbers are forecast to decline by approximately 1.0 per cent per annum. Residential customer numbers are forecast to decline by 1.1 per cent annum, with other customer segments remaining flat.

**Table 5-6: Forecast customer numbers[34]**

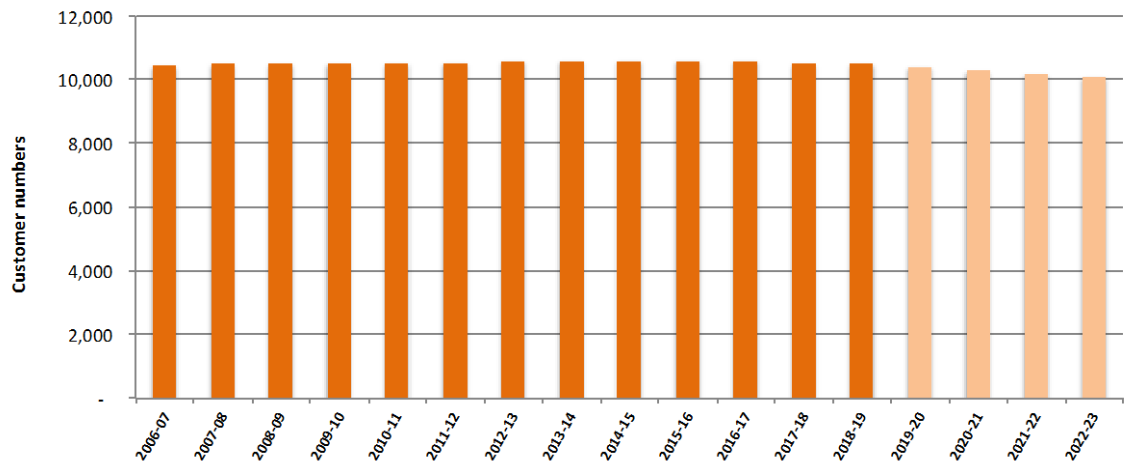
| Number of customers | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|---|
| Water | | | | | |
| Residential | 9,605 | 9,505 | 9,405 | 9,305 | 9,205 |
| Non-residential | 600 | 600 | 600 | 600 | 600 |
| Exempt customers | 216 | 216 | 216 | 216 | 216 |
| Pipeline | 46 | 46 | 46 | 46 | 46 |
| Other | 18 | 18 | 18 | 18 | 18 |
| **Total water customers** | **10,485** | **10,385** | **10,285** | **10,185** | **10,085** |

Source: Essential Water analysis.

There are also two mines operating in the Broken Hill area, Perilya Limited and Broken Hill Operations. Perilya has been operating for some time, while Broken Hill Operations started to ramp up operations in June 2012. Our forecast assumes that the mines will remain at current levels of consumption and that no new mines will commence operations during the regulatory period.

Figure 5-7 shows the movement in the number of water customers since 2006-07.

**Figure 5-7: Water customers from 2006-07**




Source: Essential Water analysis.

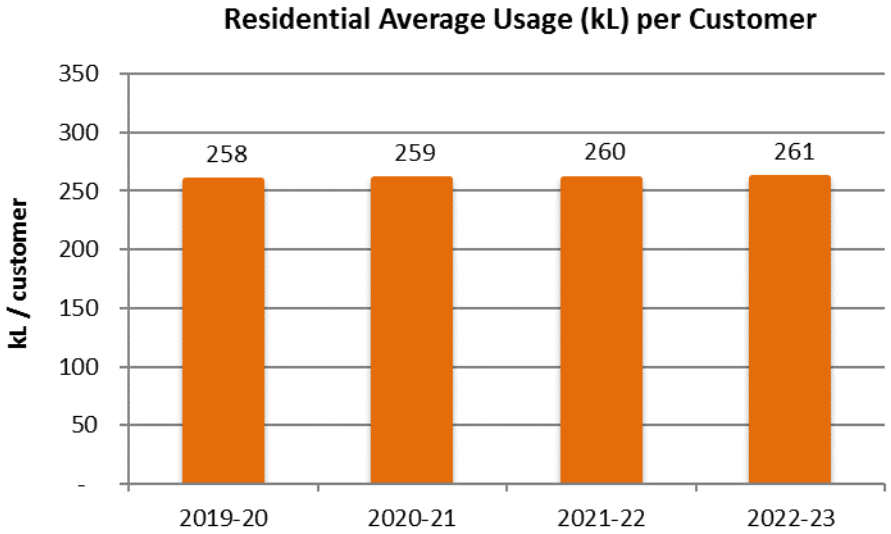
On average, customer numbers have remained relatively flat since 2006-07, but are forecast to decline during 2019-23 in line with the overall population trend in the region.

[34] The customer numbers shown in Table 5.6 and Figure 5.7 are the number of unique customers, irrespective of the number of water services they receive from Essential Water.

**Average residential usage per customer**

Figure 5-8 looks at combined average residential treated and chlorinated water usage (in megalitres) per customer.

**Figure 5-8: Average residential consumption per customer (treated and chlorinated water)**




Source: Essential Water analysis.

As illustrated, average water consumption per residential customer is forecast to remain relatively constant over 2019-23, averaging 260 kL per year per residential customer. The actual usage per customer is dependent on a number of factors, including:

- effects of increased water pricing,
- availability of usage charges which provide incentives to reduce usage to efficient levels to lower bills,
- community awareness of the need to reduce consumption for environmental sustainability, and
- introduction of a number of water savings programs, including educational resources around efficient and effective irrigation and water efficiency advice and a water efficiency calculator available on our website at http://www.essentialwater.com.au.

## 3.4 Forecast water sales and customer numbers – summary

We are forecasting the following growth rates for customer numbers and water sales over the 2019-23 regulatory period:

- customer numbers to decline by 1.0 per cent per year in line with the population trend,
- treated water sales to decline by 0.4 per cent per year,
- chlorinated water sales to remain flat,
- untreated water sales to remain flat, and
- total water sales to decline by 0.4 per cent per year.

# 4 SEWERAGE VOLUMES AND CUSTOMER NUMBER FORECASTS

Forecasts of sewage volumes are required for forecasting sewage treatment costs and for setting sewerage usage charges for non-residential customers. Essential Water's forecasts have taken into

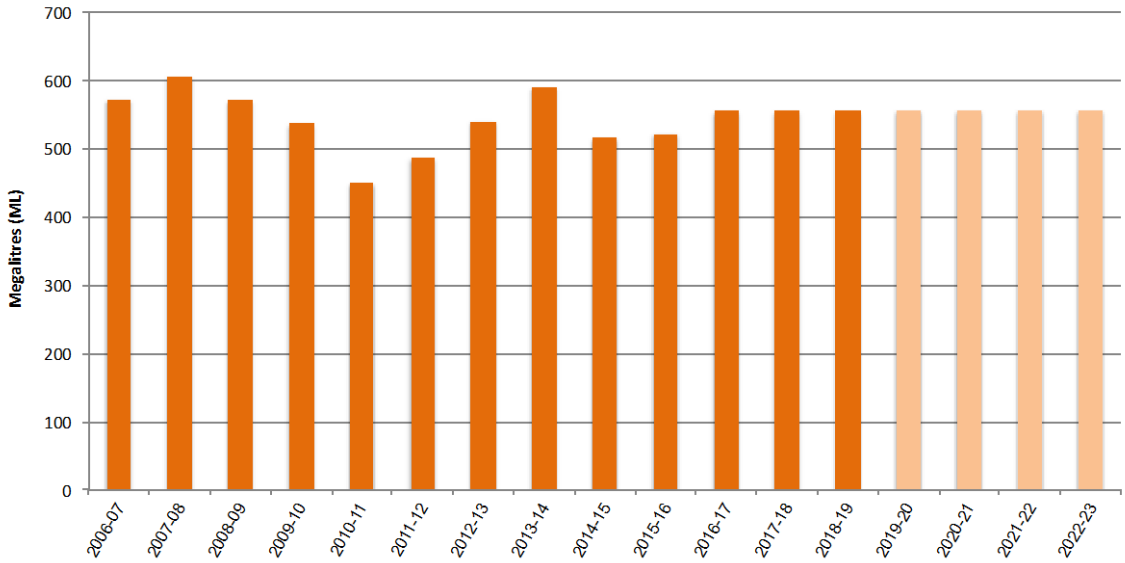
consideration a range of possible scenarios of future per capita sewage contributions and rates of inflow and infiltration into the sewerage system in order to estimate the long-term trend.

However, as with water forecasts, short-term factors such as weather or seasonal impacts mean that sewerage volumes in any particular year may vary significantly from the trend, and the sewerage system needs to be built to cope with above-average flows occurring over short periods of time.

## 4.1 Forecast sewerage volumes for 2019-23

Table 5-9 shows historical volumes in the current regulatory period, and mean forecast sewerage volumes for the 2019–23 regulatory period.

**Figure 5-9: Billable sewerage volumes**




Source: Essential Water analysis.

**Table 5-7: Forecast sewerage volumes by customer type**

| Volume (ML) | Forecast | | | | |
|---|---|---|---|---|---|
| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Billable sewerage volumes | | | | | |
| Residential | - | - | - | - | - |
| Non-residential & mines | 288 | 288 | 288 | 288 | 288 |
| Exempt properties | 267 | 267 | 267 | 267 | 267 |
| Total billable sewerage volumes | **555** | **555** | **555** | **555** | **555** |

Source: Essential Water analysis.

As illustrated, Essential Water is proposing flat billable sewerage volumes over the 2019-23 regulatory period, in line with billed volumes from 2016-17.

## 4.2 Customer number forecasts for 2019-23 - sewerage

Table 5-8 sets out the forecast sewerage customer numbers.

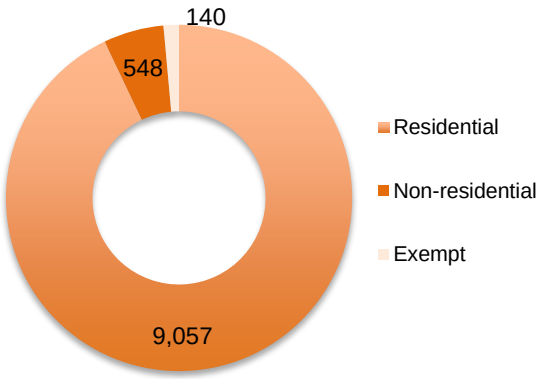
**Table 5-8: Forecast sewerage customer numbers**

| Number of customers | Forecast | | | | |
|---|---|---|---|---|---|
| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Residential | 9,057 | 8,957 | 8,857 | 8,757 | 8,657 |
| Non-residential | 548 | 548 | 548 | 548 | 548 |
| Exempt customers (no access fee) | 140 | 140 | 140 | 140 | 140 |
| **Total sewerage customers** | **9,745** | **9,645** | **9,545** | **9,445** | **9,345** |

Source: Essential Water analysis.

As illustrated, Essential Water is forecasting a decline of 1.1 per cent per annum in residential sewerage customer numbers over the 2019-23 regulatory period, in line with the population trend. Non-residential and exempt customer numbers are forecast to be flat.

**Figure 5-6: Sewerage customers by category**




Source: Essential Water analysis.

As illustrated, residential customers make up 93 per cent of our sewerage customers, with non-residential customers comprising 6 per cent, and exempt customers comprising the remaining 1 per cent.

## 4.3 Forecast sewerage volumes and customer numbers – summary

We are forecasting the following growth rates for customer numbers and sewerage volumes sales over the 2019-23 regulatory period:

- customer numbers to decline by 1.0 per cent per annum, and
- billable sewerage volumes to remain flat.

# Chapter 6 - Capital expenditure

# 1 SUMMARY

Broken Hill, located in far western NSW with a semi-arid climate of minimal average rainfall, is dependent on the Menindee Lakes on average in eight out of ten years for its water supply. The pipeline from Stephens Creek reservoir to Menindee, commissioned in the early 1950s, is nearing the end of its useful life. Increasing frequency of serious droughts has resulted in major emergency drought projects being required to provide Broken Hill and its communities with water.

During the current 2014-19 regulatory period, there have been significant challenges in maintaining a reliable and secure water supply to Broken Hill and its communities. A major drought commenced in 2014, and the Menindee Lakes reached a record modern time low of below three per cent total storage. Broken Hill had water restrictions for approximately two years during this period.

In order to secure a long-term bulk water supply for Broken Hill, in the spring of 2017 the NSW Government directed WaterNSW to construct a new pipeline to take water from the Murray River near Wentworth to Broken Hill. The new pipeline will replace the Menindee to Stephens Creek pipeline that takes water from the Darling River as the primary bulk water supply for Broken Hill and surrounding areas.

Essential Water has commissioned the NSW Department of Public Works (PWA) to conduct an assessment on additional, or 'consequential' works that we are required to undertake to upgrade the existing water reticulation system prior to completion of the Wentworth to Broken Hill pipeline, including provision of alternative water supplies to those customers who will be disadvantaged by the reconfiguration of the water supply system. This assessment concluded that consequential works of approximately $59 million are required. These costs are outlined in this chapter.

Construction of the Wentworth to Broken Hill pipeline is currently underway, with completion expected in December 2018 and full commissioning in April 2019. With proposed bulk water supply going directly from the Murray River to Broken Hill, Essential Water placed a number of planned capital works projects on hold, as it was likely they would not be required. These included:

- Project 1. Stephens Creek emergency pumping station – No 4 Unit (this is dependent on a business case to obtain funding to secure Broken Hill's backup supply),
- Project 3. Imperial Lake Reservoir dam wall rehabilitation (this reservoir will be decommissioned when the Wentworth to Broken Hill pipeline is commissioned, as Stephens Creek will become the backup supply to the Murray),
- Project 10. Menindee pipeline repairs (works have been reduced to only minimal repairs to keep the pipeline operational until the Wentworth to Broken Hill pipeline is commissioned),
- Project 11. Water pumping station refurbishment / overhauls (works have been reduced to only minimal repairs to keep the pipeline operational until the Wentworth to Broken Hill pipeline is commissioned.

**Box 6-1: Key points**

Total capital expenditure (capex) over the current regulatory period is forecast to be $36.4 million compared to the determination allowance of $42.6 million, an under-spend of $6.2 million ($2018-19), or 15 per cent. One of the reasons for the under-spend was the requirement to undertake an additional $13.8 million of emergency drought works that was funded by the NSW Government to ensure a secure water supply for the region. The emergency drought works expenditure has not been included in our reported capex for the current period, and therefore our reported capex, while accurate, is understated for meaningful comparisons with the IPART capex allowance.

Proposed capex for the 2019-23 regulatory period is $65.7 million, comprising $22.0 million of capex for water services, $39.6 million of capex for sewerage services and $4.1 million of capex for non-system (support) assets.

Key capex projects and programs include:

- Wills Street wastewater treatment plant - $34.2 million, which represents 52 per cent of the forecast capex in the upcoming period. While it is critical that this project proceeds, in its absence our total proposed capex would be $31.4 million, or **26 per cent below** IPART's approved capex for the 2014-15 to 2017-18 determination period ($2018-19).
- Menindee water treatment plant, and
- Rocky Hill No. 2 service reservoir, plus three service reservoir refurbishments.

Consequential works arising from the new bulk water supply arrangements are forecast to be $59 million, subject to detailed review by Infrastructure NSW. While the consequential works are discussed in this chapter, the proposed tariffs contained in Chapter 13 'Tariff structures and price path' do not include the consequential works, as separate funding is assumed for these works.

Essential Water's proposed capital expenditure is shown in Table 6-1:

**Table 6-1: Proposed capital expenditure for 2019-23**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Water | 11,231 | 4,566 | 2,089 | 4,092 | 21,979 |
| Sewerage | 2,588 | 15,782 | 15,753 | 5,467 | 39,590 |
| Non-system | 1,594 | 973 | 761 | 770 | 4,098 |
| **Total** | **15,413** | **21,322** | **18,604** | **10,329** | **65,667** |

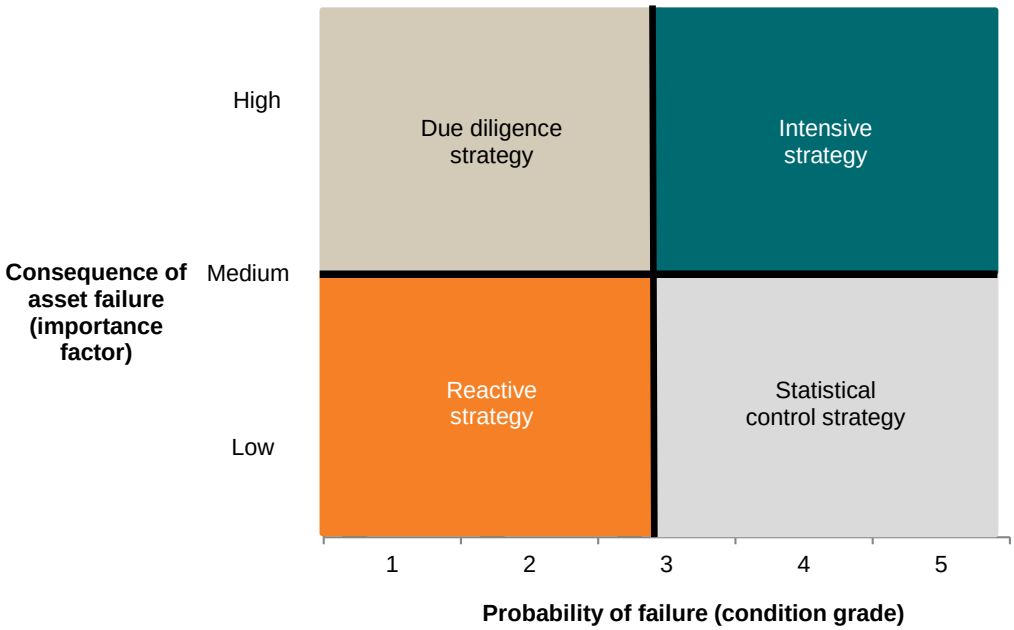
Source: Essential Water analysis

# 2 PLANNING APPROACH

## 2.1 Planning approach

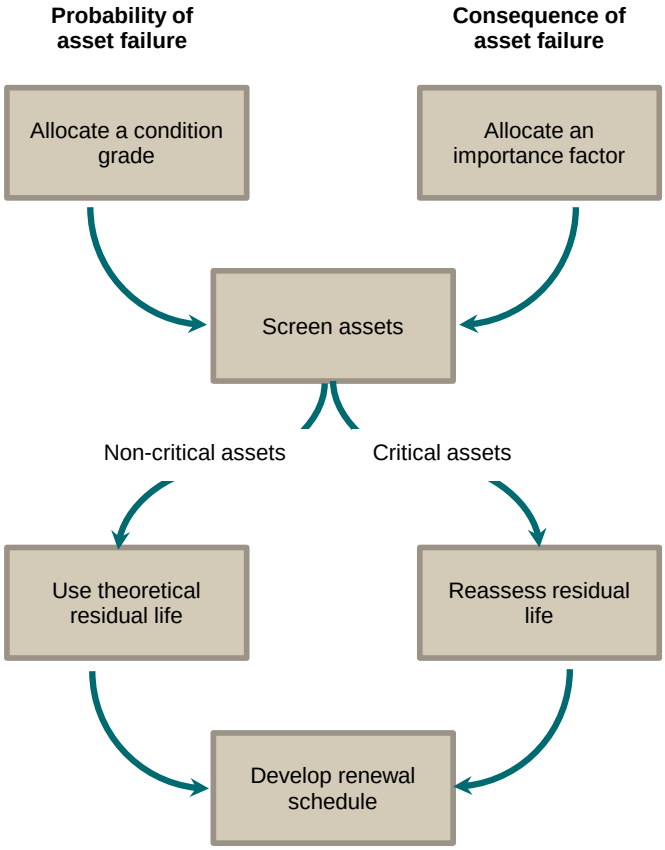
Essential Water follows a risk-based approach to asset management and follows a number of interrelated processes to ensure expenditure is prudent and efficient. These processes include water and sewerage network augmentation, demand management, reliability, quality and security of supply, asset renewal and asset maintenance. In planning for asset renewal, Essential Water utilises a number of plans, including the JWP Asset Management Plan (2007), the CARDNO Operational and Capital Management Review (2009), a 30 Year Plan and a Water Asset Management Plan. Figures 6-1 and 6-2 outline the process we undertake during infrastructure renewal planning. Also refer to PWA's Integrated Water Cycle management plan (IWCM).

**Figure 6-1: Infrastructure failure risk**




*Adapted from Sydney Water Corporation, 2000*

**Figure 6-2: Risk management of infrastructure**




Following the risk assessment approach, Essential Water develops business cases to ensure appropriate justification of projects for all forward investments. The total proposed program requires Gate 1 approval. The larger projects over $2 million (fully loaded) are placed before Essential Energy's Non-System Steering Committee for Gate 2 approval. When final tender prices are obtained, and higher levels of expenditure formed, Gate 3 approval is required prior to final approval to proceed (see Figure 6-3).

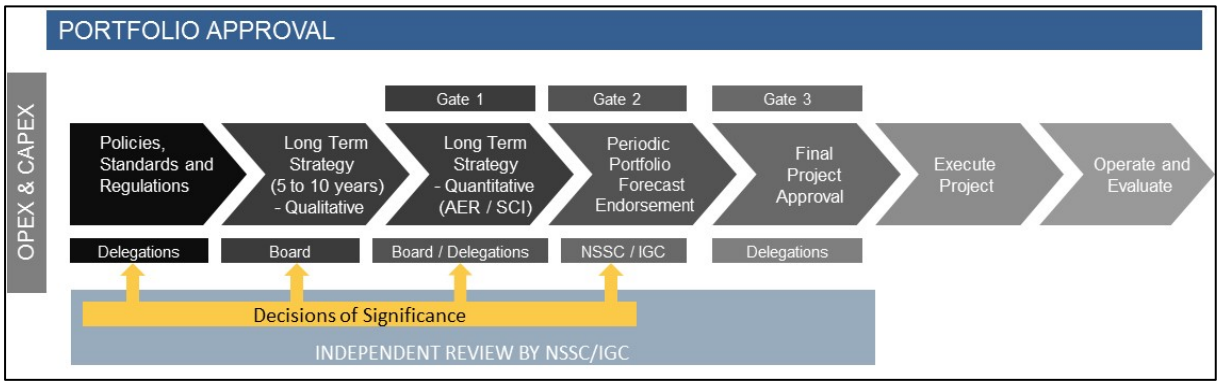
To underpin the above planning process, Essential Water records the condition of assets in the field during periodic inspections and subsequently downloads the data into an integrated asset management system, which enables us to track asset inspection and maintenance work. By relating the data to system performance, we can identify and prioritise problem areas for maintenance and / or capital investment.

By analysing data captured in the system, Essential Water is able to develop more efficient and effective asset management strategies and practices. Essential Water's systems and planning approaches ensure its expenditure decisions (including timing and priority) are prudent and efficient. This includes the extent to which Essential Water carries out options analysis and its multi-criteria analysis priority ranking process for proposed service delivery expenditures, such as cost benefit analysis and business case preparation.

## 2.2 Investment governance

Essential Water follows a defined investment governance process to ensure that expenditure is prudent, reasonable, and efficient. Figure 6-3 below shows the process that we follow:

**Figure 6-3: Essential Water investment governance process**




The Non-System Steering Committee (Water) (NSSC Water) oversees Essential Water's investment governance process. The purpose, duties and responsibilities of this committee are contained in the committee's charter.

In accordance with the determined materiality thresholds, programs / projects must be subject to:

- independent review and endorsement by the relevant committees indicated above prior to approval, and
- independent financial analysis (by internal finance department) and assessment will be required for investments that are individually assessed outside the portfolio optimisation process.

## 2.3 Asset management framework

Establishment of a sound asset management system and processes are a prerequisite for prudent and efficient capital and operating expenditure programs.

Essential Water's asset management system covers our processes for planning, development, operation, inspection, condition assessment and maintenance of all components of our water distribution and sewerage collection and disposal network.

Through this system, the physical water and sewerage system and non-system assets and other resources are efficiently and effectively managed to meet service delivery targets, ensure risks are minimised and asset economic life is maximised, in a cost-effective manner.

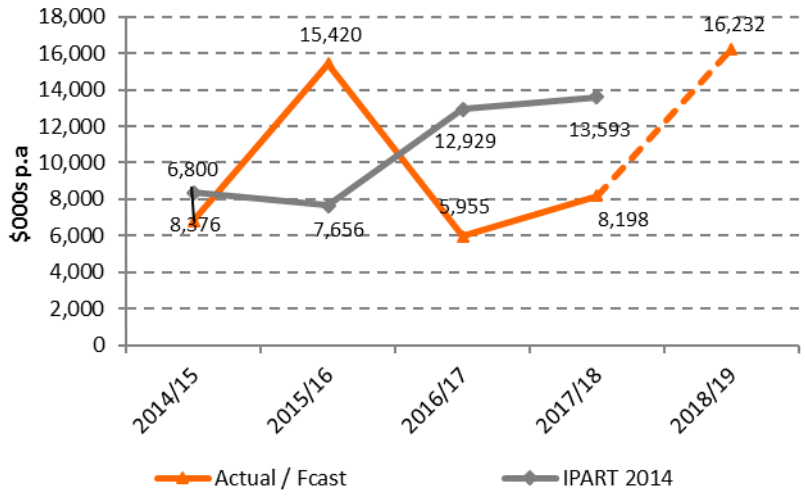
The system incorporates a detailed Water Asset Management Plan (WAMP), provided as Attachment 5, and a Strategic Business Plan (SBP), provided as Attachment 4. Together, these form an operational framework that enables us to consistently provide customers with high quality, safe and reliable water and sewerage services at the lowest possible price, while providing an adequate return for our shareholder.

Our general asset management approach is reflected in our capital expenditure program, through our strategic planned investments in capacity, security and reliability-driven asset augmentation, asset replacement, asset refurbishment and asset maintenance.

## 2.4 Performance over the 2014 regulatory period

Total capital expenditure over the 2014-18 regulatory period (2014-15 to 2017-18) is forecast to be $36.4 million ($2018-19), a decrease of $6.2 million, or 15 per cent, from IPART's allowance of $42.6 million ($2018-19).[35]

**Figure 6-4: Comparison of actual and allowed capital expenditures ($000s, $2018-19)**

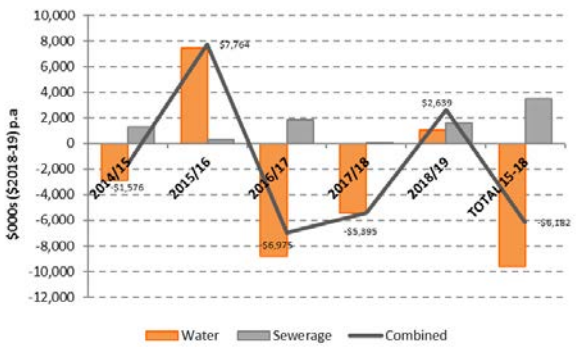


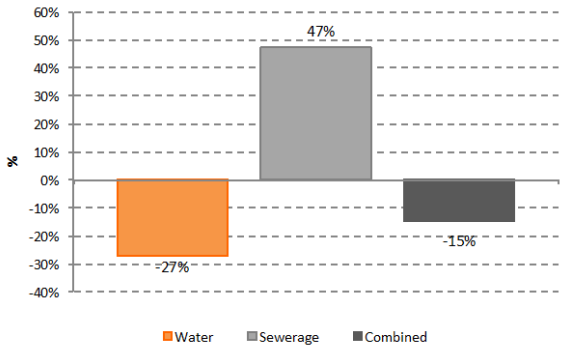

Source: Essential Water analysis.

Note: 2017-18 and 2018-19 results for Essential Water are based on forecast data.

This reduction, influenced by uncertainty over future water supply arrangements, was more than offset by $13.8 million in emergency drought works undertaken by Essential Water to maintain water supply to our customers. One of the reasons for the under-spend was the requirement to undertake an additional $13.8 million of emergency drought works that was funded by the NSW Government to ensure a secure water supply for the region. The emergency drought works expenditure has not been included in our reported capex for the current period, and therefore our reported capex, while accurate, is understated for meaningful comparisons with the IPART capex allowance.

**Figure 6-5: Actual vs allowed capex by year** **Figure 6-6: Actual vs allowed capex (per cent)**




Source: Essential Water analysis.

Note: 2017-18 and 2018-19 results for Essential Water are based on forecast data.

[35] As the IPART determination only covered the 4 years from 2014-15 to 2017-18, we only report the forecast variance for these 4 years and will not include 2018-19 results as discussed with IPART.

The main drivers for the capex under-spend in the current regulatory period include the following:

- uncertainty surrounding the new bulk water supply arrangements starting in 2016-17, which resulted in Essential Water reviewing and reprioritising its investment priorities. The capex under-spend reflects the re-prioritisation of our capital program to ensure investment only in necessary projects once the details of the new bulk supply arrangements became known. We consider this to be a responsible and prudent response to the uncertainty associated with the new bulk water supply arrangements, where continuing to invest at the IPART-approved levels would not have been in customers' long-term interests, and
- due to the worsening drought commencing 2014, Essential Water was forced to move its resources from the programmed capex works to focus on emergency drought projects in order to maintain security of supply to Broken Hill and several of its communities. As noted above, an additional $13.8 million in capex projects was completed via government funding as emergency drought works, which are not included in the above reported figures.

## 2.5 Proposed capital expenditure during 2019-23

Capital expenditure is assessed to ensure that it is necessary, efficient, and complies with industry guidelines. Essential Water is planning total capital expenditure of $65.7 million (excluding consequential works) over the 2019-23 regulatory period.

A summary of forecast capex for the 2019-2023 period is provided in the following tables.

**Table 6-2: Forecast capex by driver – water**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Water reservoirs | 633 | 139 | 424 | 994 | 2,191 |
| Service reservoirs - tanks | 2,532 | 2,493 | 74 | 663 | 5,762 |
| Pipelines | 190 | 91 | 80 | 199 | 560 |
| Water pumping stations | 376 | 169 | 169 | 304 | 1,018 |
| Reticulation | 715 | 593 | 603 | 762 | 2,674 |
| Water transfer mains | 13 | 12 | 12 | 13 | 50 |
| Water treatment plants | 4,786 | 196 | 199 | 248 | 5,429 |
| Other | 272 | 176 | 209 | 285 | 942 |
| Direct costs | 9,518 | 3,870 | 1,771 | 3,468 | 18,626 |
| Corporate overheads | 1,713 | 697 | 319 | 624 | 3,353 |
| **Total** | **11,231** | **4,566** | **2,089** | **4,092** | **21,979** |

**Table 6-3: Forecast capex by driver – sewerage**

| $000 Real 2014 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Sewer rising mains | - | - | - | - | - |
| Sewerage pumping stations | 256 | 442 | 203 | 285 | 1,186 |
| Reticulation | 633 | 605 | 615 | 663 | 2,516 |
| Sewerage treatment plant | 1,152 | 12,219 | 12,421 | 3,486 | 29,278 |
| Other | 152 | 109 | 111 | 199 | 570 |
| Direct costs | 2,193 | 13,375 | 13,350 | 4,633 | 33,550 |
| Corporate overheads | 395 | 2,407 | 2,403 | 834 | 6,039 |
| **Total** | **2,588** | **15,782** | **15,753** | **5,467** | **39,590** |

**Table 6-4: Forecast capex by driver – non-system**

| $000 Real 2014 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| IT | 1,289 | 710 | 465 | 380 | 2,845 |
| Furniture, fittings, plant and equipment | 77 | 77 | 77 | 77 | 308 |
| Motor vehicles | 178 | 136 | 169 | 263 | 746 |
| Buildings | 50 | 50 | 50 | 50 | 200 |
| **Total** | **1,594** | **973** | **761** | **770** | **4,098** |

**Table 6-5: Forecast capex – corporate overheads shown separately (excluding consequential works)**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Water | 9,518 | 3,870 | 1,771 | 3,468 | 18,626 |
| Sewerage | 2,193 | 13,375 | 13,350 | 4,633 | 33,550 |
| Non-system | 1,594 | 973 | 761 | 770 | 4,098 |
| Corporate overheads | 2,108 | 3,104 | 2,722 | 1,458 | 9,392 |
| **Total** | **15,413** | **21,322** | **18,604** | **10,329** | **65,667** |

**Table 6-6: Forecast capex – corporate overheads allocated to water and sewerage services (excluding consequential works)**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Water | 11,231 | 4,566 | 2,089 | 4,092 | 21,979 |
| Sewerage | 2,588 | 15,782 | 15,753 | 5,467 | 39,590 |
| Non-system | 1,594 | 973 | 761 | 770 | 4,098 |
| **Total** | **15,413** | **21,322** | **18,604** | **10,329** | **65,667** |

**Figure 6-7: Proposed capital expenditure by driver ($2018-19)**

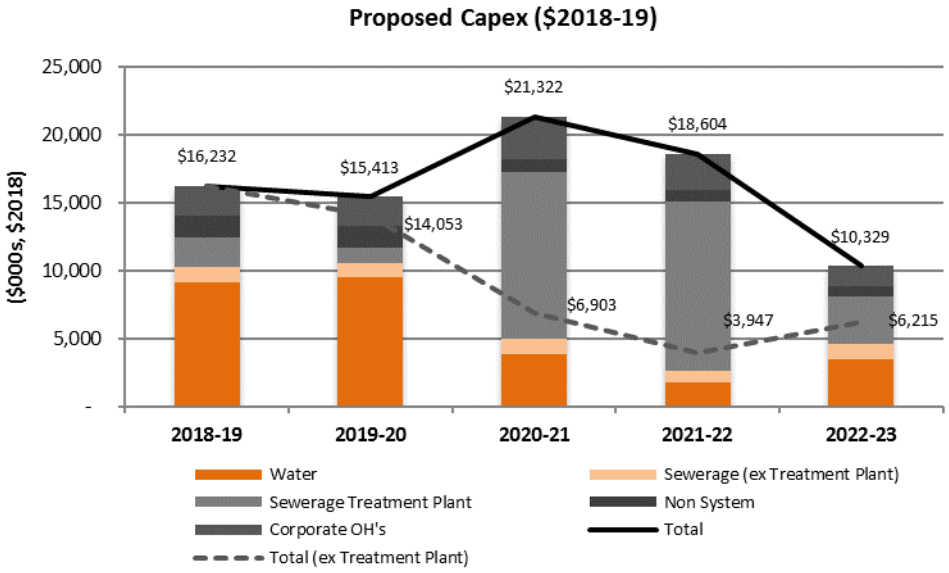
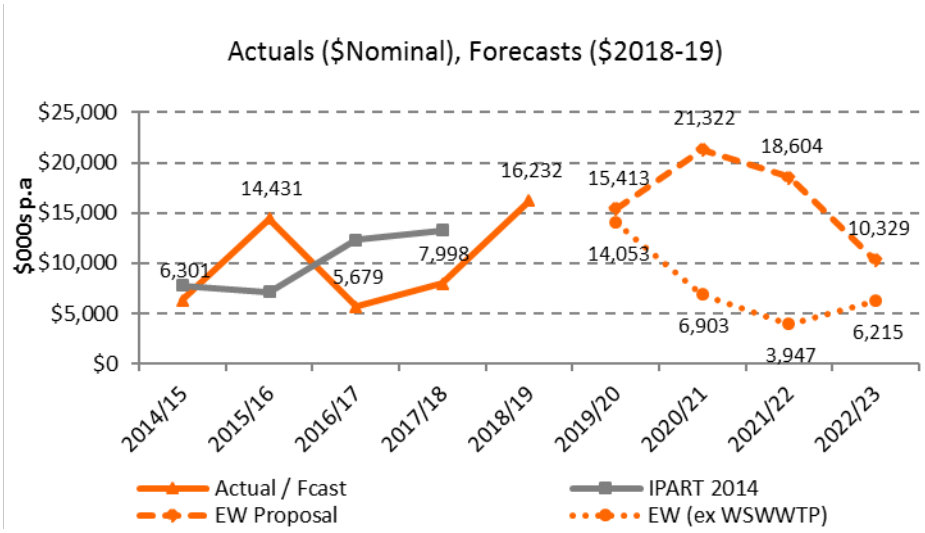



**Figure 6.8: Proposed capex for the 2019-23 period**




Source: Essential Water analysis.

Note: 2017-18 and 2018-19 results for Essential Water are based on forecast data.

As illustrated above, forecast capex for the 2019-23 regulatory period is $65.7 million, comprising $22.0 million for water services, $39.6 million for sewerage services and $4.1 million for non-system expenditures.

When non-system assets are allocated to water and sewerage services, proposed capex for 2019-23 is $23.9 million for water services and $41.8 million for sewerage services.

The capex program we are proposing is required to ensure we can continue to meet customer service levels, our legislative and environmental obligations, and will also result in reductions in opex, through reduced maintenance costs.

The largest and most significant project is the $34.2 million Wills Street wastewater treatment plant replacement. Built in the 1930s, the existing plant is nearing the end of its useful life and requires

constant remediation work to limit discharging. This is unsustainable moving forward. The plant needs to be replaced to ensure we can comply with our environmental obligations and service standards.

The new wastewater treatment plant represents over half of our proposed capex program and it is critical that this project proceeds. Without it, our total proposed capex would be $31.4 million, or **26 per cent below** IPART's approved capex for the 2014 period.

Other key proposed expenditures include service reservoir refurbishments, water treatment plant upgrades, and sewerage reticulation replacement as outlined in section 2.6 below.

## 2.6 Proposed capital expenditure projects and programs

Our proposed capital expenditure projects and programs are discussed below.

### Water reservoirs

#### Stephens Creek reservoir

This reservoir is supported by an earthen embankment with concrete dam spillways built in the late 1800s. Levees were constructed in the 1970s and 1980s to reduce evaporation and improve water quality. Due to the age and construction methods used, these require ongoing works to ensure safety and functionality. This is a prescribed dam under the *Dams Safety Act (1978)* and is therefore subject to regulation by the NSW Dam Safety Committee (DSC). Essential Water has been instructed to undertake the necessary restoration works in order to ensure compliance.

#### Umberumberka reservoir

Umberumberka reservoir was constructed in 1914 and requires ongoing general works to keep it safe and effective. Works planned for the 2019-23 regulatory period include fencing, road works, spillway restoration and other general works.

#### Imperial Lake reservoir

Imperial Lake is an emergency storage reservoir located close to Broken Hill. The dam wall is non-compliant with DSC safety guidelines and requires major capital works to achieve compliance. In addition to safety concerns, the reservoir has poor water quality due to the streets of Broken Hill being in its catchment, and poor supply reliability, with a single pump within a pumping station located inside the dam. Essential Water considers it to be more cost effective to decommission the reservoir than to continue to maintain it over the upcoming regulatory period and plans to do so once the Wentworth to Broken Hill pipeline is operational.

### Service reservoirs

Essential Water has a number of steel and concrete water service reservoirs that store water, ready for reticulation to customers. These reservoirs have a finite life and require maintenance to prevent corrosion and structural degradation.

Significant service reservoir projects planned include:

- replacement of the Mica Street service reservoir, which has major structural faults,
- construction of a new, smaller service reservoir at Rocky Hill to act as a back-up to the existing reservoir, allowing the older one to be removed from service for refurbishment,
- refurbishment of the Hebbard Street service reservoir, and
- refurbishment of Wyman Street service reservoir.

### Pipelines

The major water pipelines servicing Broken Hill are:

#### Stephens Creek to Broken Hill pipeline

A 1.5 kilometre and three kilometre section of Rocla pipeline need to be replaced. Essential Water is submitting a business case for Government funding to replace these sections. (This funding is not included in the pipelines estimate and is reliant on Government consequential works funding.)

### Umberumberka to Broken Hill pipeline

The Umberumberka pipeline transfers water from Umberumberka to Mica Street water treatment plant (WTP). It was installed circa 1913-14. Almost all the gravitational main has been replaced, with recycled pipes replacing the old wood-stave pipes and, later, major sections replaced with asbestos cement and mild steel cement lined pipe.

Essential Water plans to undertake minor replacements to this pipeline as required during the determination period.

### Imperial Lake pipeline

The Imperial Lake pipeline is of lesser importance; however, the pipeline also feeds a number of customers and will need to be maintained.

### Water pumping stations

The main electric pumping stations to Broken Hill are:

- Menindee pumping station (to be decommissioned),
- interconnecting channel pumping station (to be decommissioned),
- Menindee booster pumping station (to be decommissioned),
- Kinalung pumping station (to be decommissioned),
- Kinalung booster pumping station (to be decommissioned),
- Stephens Creek pumping station (replacement pumping station as part of consequential works), and
- Wentworth to Broken Hill pipeline pumping station (new pumping station 21 kilometres from Broken Hill, which will become Essential Water's asset after commissioning).

The mechanical and electrical pumps, motors and switchgear are subject to regular and periodic rebuilding / replacement to maintain reliability and efficiency.

The existing pump station at Stephens Creek needs to be replaced, due to increasingly poor reliability. The new pumping station will provide backup to the Wentworth to Broken Hill pipeline and will help secure Broken Hill's water supply. Essential Water is providing a business case to the Government to secure funding assistance for this backup pumping station. (This funding is not included in the pumping station estimate and is reliant on Government consequential works funding.)

### Water reticulation

The plan provides for regular and ongoing capital expenditure on mains renewal to replace obsolete and leaking asbestos cement reticulation pipes with modern PVC pipes. The plan provides for approximately 1.5 kilometres to be replaced per annum.

### Water treatment plants

Water treatment plants (WTPs) within Essential Water's service area are:

- Mica Street WTP,
- Menindee WTP and chlorination plant,
- Sunset Strip WTP, and
- Silverton chlorination plant.

The most significant asset is the Mica Street WTP, which was commissioned in June 2010 and provides potable water to Broken Hill.

These WTPs require ongoing capital works and maintenance to secure water supply and quality. Portions of the new Menindee plant replacement and commissioning are allowed for in the 2019-23 regulatory period. Also included is the Mica Street WTP, which despite being relatively new, requires

concrete remediation, ongoing refurbishment and maintenance due to water quality variations and equipment failure.

Essential Water is currently seeking regulatory approval to supply treated water from the new Menindee WTP to Sunset Strip. This proposal is contingent on Government funding for a pipeline from Menindee to Sunset Strip.

### Sewerage pumping stations

The Wentworth Road pumping station is programmed for replacement. In addition, the mechanical and electrical pumps, motors and switchgear at the various sewerage pump stations are subject to regular and periodic rebuilding / replacement to maintain reliability and efficiency.

### Sewerage reticulation

Regular and ongoing capital expenditure is required to assess the condition of, renew and /or repair the Broken Hill sewerage reticulation system, which comprises sewerage mains, vents, access chambers and lids. Most of the existing sewerage pipes can be relined with PVC piping, but a small proportion will need to be replaced due to their poor condition. The plan provides for approximately five kilometres of sewerage pipeline to be relined (out a total of 248 kilometres), and 14 access chambers relined (out of a total of 3,400), per annum.

### Sewerage treatment

Broken Hill has two wastewater treatment plants (WWTPs):

- Wills Street wastewater treatment plant, servicing the city north of the Line of Lode, and
- South Broken Hill wastewater treatment plant, servicing the city south of the Line of Lode ($0.2 million).

South Broken Hill wastewater treatment plan is over fifty years old. Wills Street wastewater treatment plant, which was originally constructed in 1939, has been subject to concrete degradation due to the corrosive effects of sulphuric acid, a by-product of sewerage breakdown. This has resulted in groundwater contamination and non-compliance with environmental requirements.

Replacement of the Wills Street wastewater treatment plant is the **highest priority and largest project** for Essential Water during the 2019-23 determination period.

### Other works

Other water and sewerage system works will be required on an ongoing basis. These include upgrading SCADA and telemetry, upgrading and replacing various minor pumps and dosing systems, various sewerage works and other miscellaneous works.

### Non-system expenditure

Non-system expenditure is an important support cost associated with providing network infrastructure. Our proposed capital expenditure program contains the following non-system expenditure categories:

- **Information technology (IT)**

  During the 2019-23 regulatory period, Essential Water will leverage IT as the primary enabler for business transformation.

  Our technology investment strategy is aimed at improving efficiency and lowering operating and capital costs to achieve the service affordability that our customers value.

  It involves adopting modern alternatives to traditional, longer-term IT capital investments and rationalising existing legacy applications and infrastructure. Planned outcomes include:

  - transformed core asset management practices,
  - transformed back office operations,
  - efficiently-bundled and scheduled work tasks,

- advanced asset health and management insights, and
- better ways of communicating with customers and other distributors.

- **Furniture, fittings, plant and equipment (F, F, P & E)**

  Minor expenditure of $77,000 is proposed each year over the four-year regulatory period to replace furniture, fittings, plant and equipment.

- **Motor vehicles**

  Most of our network programs are carried out using heavy and light commercial vehicles. The impact of fleet reliability on work program efficiency is part of our fleet asset management strategy.

  We have forecast a steady investment in our fleet, to ensure customer prices reflect the optimum balance between new vehicle costs and maintenance and repair costs.

- **Buildings**

  Essential Water manages properties located across an extensive area. Each site requires ongoing investment and maintenance to support efficient delivery of network investment programs and ensure we comply with relevant workplace safety legislation.

# 3 CONSEQUENTIAL WORKS

Consequential works, including those arising from the new Wentworth to Broken Hill pipeline, are forecast to be $59 million during 2019-23. This includes $10 million to decommission the brine ponds built as part of the reverse osmosis plant, which will not be required once the new pipeline is in service. While the consequential works are discussed in this chapter, the proposed capital expenditures in this submission and the tariffs contained in Chapter 13 ‘Tariff structures and price path’ do not include the consequential works, as separate funding is assumed for these works.

As discussed in Section 4 of Chapter 2 ‘Form of regulation', **Essential Water is seeking external funding from the NSW Government for the entire consequential works program.** Therefore, the revenues and prices contained in this water and sewerage pricing submission exclude the costs of the required consequential works.

We propose to include consequential works as a pass through event to address the circumstance where Essential Water’s application for Government funding for some or all of the works is not successful. The intent of the pass through event is to provide Essential Water with the opportunity to seek to include some or all of the consequential works in customer tariffs once we have visibility of the funding decision from Government, which will occur after our submission has been lodged with IPART.

The consequential works and indicative cost estimates are identified below:

**Table 2.6: Forecast of consequential works**

($000s, $2018-19)

| Item no. | Item | Forecast cost (ex GST) |
|---|---|---|
| 1 | New Stephens Creek pumping station, Rocla pipeline section 4, Rocla pipeline section 5, Stephens Creek off-line storage | 31,497 |
| 2 | Pipeline to the caravan park and Sunset Strip, supplying 0.25 ML/day to Sunset Strip and 0.15 ML/day to the caravan park (5 L/s @ 22 hours/day) | 1,534 |
| 3 | Stephens Creek to Menindee pipeline replacement (100mm diameter) | 10,800 |
| 6 | Pre-treatment at Mica Street WTP | 2,225 |
| 7 | Essential Water management and planning | 3,000 |
| **Total** | **Consequential works associated with the new Wentworth to Broken Hill pipeline** | **49,055** |
| | Brine pond disposal | 10,000 |
| **Total** | **Consequential works including brine ponds disposal** | **59,055** |

Source: PWA - Broken Hill Long Term Water Supply - Consequential Works Business Case Draft v3 Report - Dated: 2 May 2018

The need for each of these consequential works is discussed below:

### Item 1a – New Stephens Creek pumping station

The scope of works includes construction of two new pumping stations at the Stephens Creek reservoir, approximately 16 kilometres northeast of Broken Hill. The existing Stephens Creek pumping station will be decommissioned after the new pumping stations have been commissioned. Water from the new Wentworth to Broken Hill pipeline will be directed either into the existing Stephens Creek reservoir, or into the new storage reservoir(s) if constructed. From there, the new Stephens Creek pumping station will pump water to the Mica Street WTP.

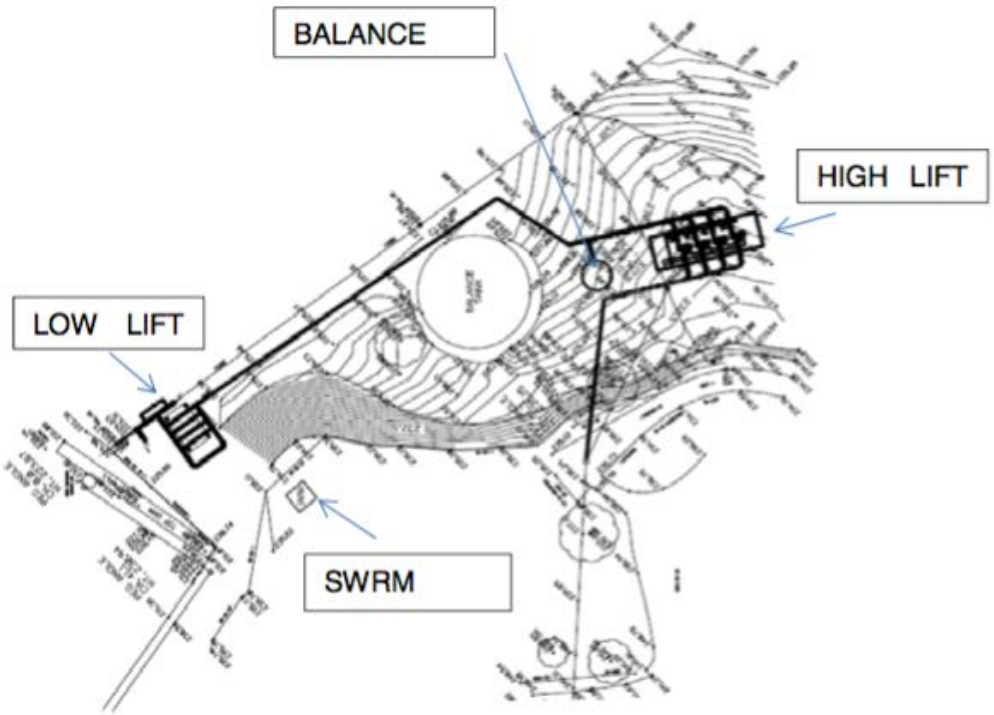



**Figure 1.1: Proposed Layout of the new Stephens Creek Pump Stations and Balance Tank**

Source: NSW Public Works Advisory. Essential Water Preliminary Assessment - Consequential Works resulting from the WaterNSW Murray River to Broken Hill Pipeline Project Date: August 2017. Page 6.

**Items 1b and 1c – Replacement of sections 4 and 5 of the Rocla pipe**

Raw water is currently pumped from the Stephens Creek reservoir along a 16.3 kilometre 600NB pipeline to the Mica Street WTP. The pipeline was originally comprised of mild steel cement lined (MSCL) and reinforced concrete pipe sections, but many of the original sections of concrete pipe were prone to failure and have progressively been replaced with MSCL with a 'Sintakote' external pipe coating protection. The pipeline is now predominantly MSCL, with only two sections of Rocla type concrete pipe remaining.

This pipeline is vital to the continuity of raw water supply to Broken Hill and replacement of these concrete pipe sections is to be undertaken while maintaining supply to Broken Hill.

Section 4 – Total length of 1,524 metres closer to Stephens Creek. This section of concrete pipeline connects into the MSCL pipe section near the Potosi Mine, towards Broken Hill. The section of pipe that crosses a haul road for the existing Potosi Mine has already been replaced with MSCL Sintakote pipe.

Section 5 – Total length of 3,415 metres into Mica Street WTP. Until now, there have been minimal failures on this section through town, although most of the steel off-takes to parks and similar facilities have been replaced due to corrosion of the steel. This section of concrete pipe connects to a section of Sintakote MSCL main installed circa 2005. The new pipe will connect from the 2005 pipe through to Mica Street WTP. The existing pipe is laid through the streets of Broken Hill, mainly in the road shoulder in built-up residential areas leading up to Mica Street WTP.


**Figure 1.4: Possible temporary cross connection between the Stephens Creek to Broken Hill pipeline**

Source: NSW Public Works Advisory. Essential Water Preliminary Assessment - Consequential Works resulting from the WaterNSW Murray River to Broken Hill Pipeline Project Date: August 2017. Page 11.

**Item 1d – Stephens Creek off-line storage facility**

The proposed scope of works includes construction of a new 200 ML storage reservoir near the existing Stephens Creek reservoir. At least two basins will be provided with isolation valves for the inlets and outlets to allow each basin to be isolated independently for maintenance purposes. The basin crests will be wide enough to allow for utility vehicle access.

The reservoir will increase the amount of storage available closer to Broken Hill for water from the Murray River pumped during off-peak times, thereby minimising the amount of pumping that must be performed during peak and shoulder periods.

The new storage reservoir will be constructed with earthen embankments, which can drain to the inlet tower of the Stephens Creek reservoir, and have a small surface area to limit evaporation.

**Items 2 and 3 - Menindee to Stephens Creek pipeline**

Broken Hill receives raw water via a pipeline from the Darling River at Menindee in times when no local bulk raw water is available. When the system of transferring raw Murray River water to Broken Hill via the new Wentworth to Broken Hill pipeline is operational, the existing pipeline will no longer be required to provide bulk water to Broken Hill.

To maintain supply to existing graziers along the Menidee pipeline, it was initially proposed that the pipeline would be repurposed as a gravity main and back fed from Stephens Creek. This could be undertaken with only minor modifications to the pipeline.

The repurposing of the current 600mm diameter above ground steel pipe would have a capacity of about 23.5 ML. If the graziers use less than one ML on a daily basis, water may become stagnant in the large diameter pipe unless it is flushed frequently.

Issues exist with using the existing 70+ year-old pipeline to backflow to Sunset Strip:

- the pipe is in a very poor condition and requires continual maintenance to keep it serviceable,
- the long retention times and heat during the summer will allow the growth of *Naegleria Fowleri,* a heat-loving (thermophilic) single-celled organism, which could be harmful to domestic animals,

- algae might be present, either from the terminal storage outside Broken Hill or from Stephens Creek, and with the long retention times in the 600mm pipe will die, producing toxins which can be deadly to stock, and
- the water received from the Murray River appears to be highly corrosive to cement lined pipes (it removes the cement into solution) which will further deteriorate the existing pipeline and increase maintenance activities.

Along this pipeline are two groups of customers: Sunset Strip customers and graziers.

**Sunset Strip customers**

Within the first 20 kilometres from Menindee is a caravan park and the village of Sunset Strip, a community of 138 properties. Essential Water is providing a business case for Government funding to install a small pipeline and minor pumps at Menindee to maintain supply to these communities.

The water supply to Sunset Strip is dependent on supply from the existing Menindee pipeline. We propose replacing the pipeline to Sunset Strip and modifying the current off-take pumping station. The existing steel pipe is to be replaced with a suitable DN100 HDPE pipe from Menindee to Sunset Strip, 21.2 kilometres in length.

This will involve installation of the 100 mm pipeline into a trench to the side of the existing pipeline. The exact location will depend on factors such as topography, and be determined during a functional design stage.

Benefits of constructing a belowground pipeline include:

- cost effective pipeline construction compared to above ground,
- lower water temperatures and associated improved water quality, and
- lower chlorine dose rates.

A belowground pipeline will not require anchors for thermal movement. For welded joints, thrust anchors are not required at fittings or changes in direction. For rubber ring joint systems, thrust restraint in the form of mass concrete anchor blocks will be required at valves, tees and bends.

**Graziers**

The remaining 80 kilometres of the pipeline beyond Sunset Strip supplies water to ten graziers. Essential Water is providing a business case for Government funding to maintain supply to these communities other than from the existing aged pipeline.

**Item 4 – Pre-treatment at Mica Street**

Raw water supplied to Broken Hill from the Murray River would be pumped via a 270-kilometre pipeline with a 760 ML terminal storage located 21 kilometres from Broken Hill.

The introduction of a terminal storage facility provides WaterNSW with the ability to reduce the capacity (and cost) of the transfer pipeline. However, it also introduces a risk to water quality from blue green algal blooms and potential release of toxins into drinking water supplies.

While WaterNSW has indicated that it will implement in-storage measures to minimise the risk of algal blooms, the introduced risk to water quality is potentially significant and is the subject of a comprehensive water quality risk assessment.

Depending on the outcomes of the risk assessment, it would be prudent for Essential Water to make provisions for either temporary or permanent upgrades to the existing Mica Street treatment process to manage likely events such as a blue green algae outbreak that may occur within the WaterNSW terminal storage.

**Silverton**

Silverton supply is a chlorinated raw water supply. Essential Water is not intending to install a water treatment plant at Silverton during this determination period due to other priorities. The main risks to raw water for domestic supply are *Naegleria Folweri* (the barrier for which is chlorine) and cyanotoxins in untreated water.

Essential Water is applying to the NSW Government to fund several consequential works projects including the reinstatement of redundant filters at the Mica St WTP to remove cyanobacteria and toxins from the raw water supply to retail and commercial customers directly affects Silverton.

**Mica Street brine pond disposal**

A 550 ML brine pond associated with the desalination plant at the Mica Street WTP was constructed as part of the emergency water supply Government funded projects to secure Broken Hill's short-term water supply during significant drought events in western NSW.

The brine pond was constructed on a Perilya Limited mining lease under a *Crown Lands Act* – Section 34 temporary approval lease, which expires in August 2020 based on an agreement with the mining company.

While the recent drought has ended, the desalination plant is being operated in 'care and maintenance' mode, as it may be required to operate prior to commissioning of the Wentworth to Broken Hill pipeline in April 2019.

Once the new pipeline is operational, brine disposal will no longer be required. Funding to decommission the brine pond is being sought from Government.

Essential Water must meet a regulatory requirement to decommission the brine pond prior to this date, by rehabilitating the brine salts or slurry and removal of the dam liner in accordance with environmental regulations. The forecast cost of the brine pond disposal is $10 million.

# Chapter 7 - Operating expenditure

# 1 SUMMARY

Essential Water's operating expenditure (opex) forecasts have been designed to be both prudent and efficient, while also supporting a safe and secure water supply to our customers. We are entering a new era of water supply to Broken Hill from the Murray River, which has resulted in a review of our operating and maintenance activities to ensure our programs are fit for purpose and minimise long-term costs for our customers.

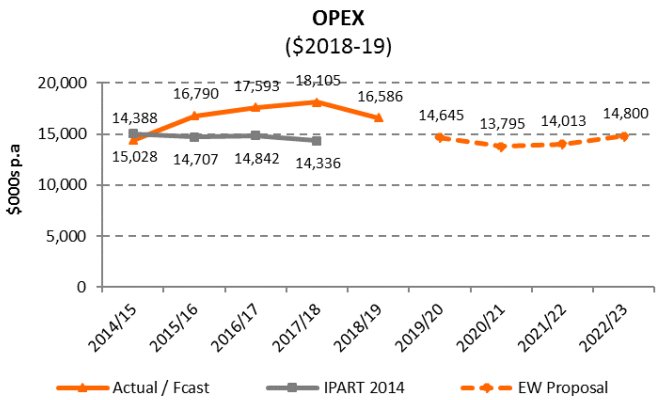
Our assumptions regarding separate Government funding on specific activities, which impact the forecasts contained in this submission, have been identified in the chapter.

**Box 7-1**

In summary:

- opex is forecast at $66.9 million ($2018-19) over the current regulatory period, an increase of $8.0 million, or 14 per cent, compared with IPART's allowances at the 2014 determination,
- the main drivers of the increase include higher than forecast electricity costs due to frequent pumping at peak times, and significant increases in retail contract prices. The cost of chemicals (chlorine is produced by passing electricity through salt water) has also increased in line with electricity costs,
- opex increases over the current regulatory period have been partially offset by wage growth, which has been on average 1.5 per cent (or below CPI) each year for six years under the current agreement,
- proposed opex for 2019-23 is $57.3 million ($2018-19), or a three per cent **reduction** on IPART's 2014 determination allowances,
- our proposed opex has been reduced through a significant efficiency program over the past three years, including a reduction in staff numbers through a hiring freeze and natural attrition, and reductions in overtime, agency staff, fleet, call-outs and travel costs, and
- further efficiency improvements can be made, but are dependent on the final arrangements for the Wentworth to Broken Hill pipeline.

**Figure 7-1 shows actual and proposed operating expenditures.**




Essential Water's proposed operating expenditure for our water and sewerage services is shown in Table 7-1:

**Table 7-1: Proposed opex 2019-23 ($2018-19)**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Water | 11,184 | 10,500 | 10,631 | 11,192 | 43,508 |
| Sewer | 3,461 | 3,295 | 3,382 | 3,608 | 13,746 |
| **Total** | **14,645** | **13,795** | **14,013** | **14,800** | **57,254** |

Source: Essential Water analysis

# 2 FORECAST OPERATING EXPENDITURES

## 2.1 Overview

As the result of three significant droughts since 2003 and serious threat to security of supply to Broken Hill, Essential Water is now entering a new era in its water supply history with the primary source of supply changing from the Menindee Lakes and the Darling River to the Murray River via the new Wentworth to Broken Hill pipeline. With Government funded consequential works projects required to maintain supply to existing customers, Essential Water can achieve efficiencies in controllable operating costs. Our proposed opex is based on:

- Government support to offset water supply to the bulk water storage 21 kilometres from Broken Hill,
- a small pipeline supply from Menindee to Sunset Strip,
- capital project works to secure the Stephens Creek supply zone, and
- Menindee pipeline customers no longer reliant on the aged Menindee pipeline.

The following assets are forecast to be retired during the next determination period once the Wentworth to Broken Hill pipeline is operational:

- Menindee pumping station large pumps and pipelines,
- an interconnecting channel pumping station,
- Menindee booster station,
- Kinalung pumping station,
- Kinalung booster station,
- Imperial Lake dam and pumping station,
- major sections of the Menindee to Stephens Creek pipeline, and
- Sunset Strip membranes water treatment plant.

New assets associated with the Wentworth to Broken Hill pipeline that Essential Water is required to maintain and operate include the following:

- Broken Hill pumping station (BHPS) located 21km from Broken Hill, adjacent to the Wentworth Road,
- 21 kilometres of pipeline from the BHPS to the Mica Street water treatment plant (WTP),
- a storage tank located at the Mica Street WTP,
- a small pipeline and pumping station from Menindee to Sunset Strip (note that this project is the subject of a separate Government funding application), and
- other assets, also subject to Government funding.

Our proposed controllable operating expenditure is prudent, while also meeting the quality and service levels required by the industry. In the next regulatory period, Essential Water is focused on creating efficiency gains through a reduction in employee numbers combined with reducing operating costs. This gain is achievable without compromising current levels of service, quality and reliability.

## 2.2 Performance over the 2014-18 regulatory period

The following figures highlight how opex is tracking against IPART's allowances from the 2014 determination.

**Figure 7-2: Comparison of actual and allowed opex during the 2014 determination ($2018-19)**

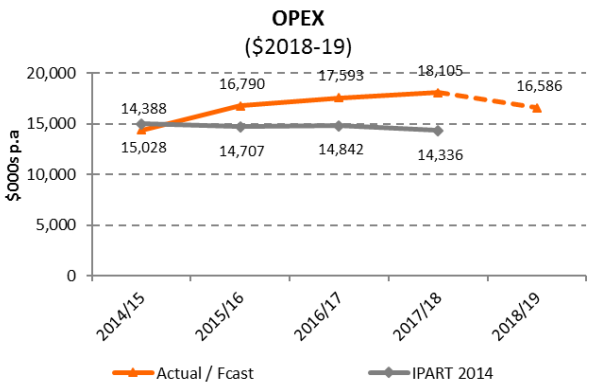



**Figure 7-3: Actual vs allowed opex ($2018-19)**

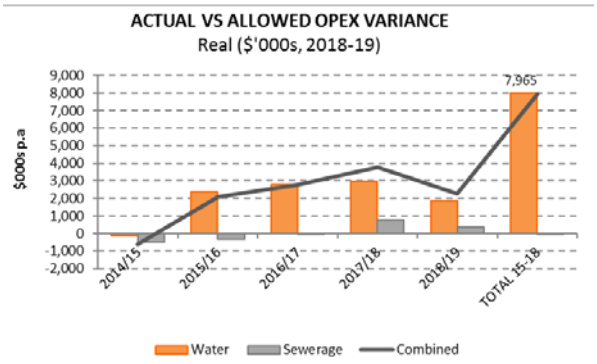
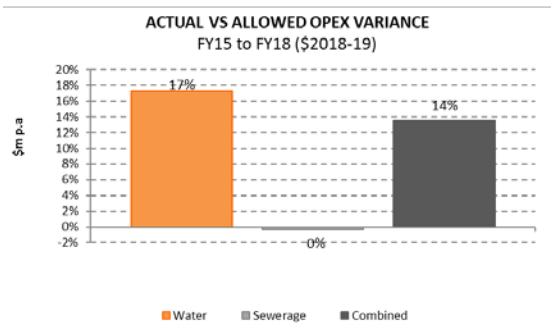



**Figure 7-4: Actual vs allowed opex (%)**




Source: Essential Water analysis.

Actual / forecast opex over the current 2014 determination period (FY15-18) is $66.9 million compared to the determination allowance of $58.9 million, or an over-spend of $8.0 million ($2018-19), or 14 per cent.[36]

[36] As the IPART determination only covered the 4 years from 2014-15 to 2017-18, we will only report the forecast variance for these 4 years and will not include 2018-19 results as requested by IPART.

The principal components of direct operating costs are salaries and wages (which account for approximately 50 per cent of total direct operating costs), materials (chemicals), property, electricity, fleet and information technology costs specifically related to water staff, for example, computers and phones.

Pumping costs also increased substantially during the period, as highlighted in Figure 7-7, and cost increases are expected to continue (see section 2.4).

During the 2014 determination period, Essential Water has focused on improving efficiency and this is shown in the operating costs and corporate overhead forecasts for the next regulatory period (see section 2.6.6). Essential Water has also implemented a number of efficiency initiatives, including a reduction of full time employees through a hiring freeze, natural attrition, cost control and a reduction in fleet, all of which partially offset operating cost increases over the current determination period.

The following charts show our efficiency improvements since the start of IPART's 2014 determination.

**Figure 7-5: Average overtime and stand-by costs per quarter for Operations ($ Nominal)**

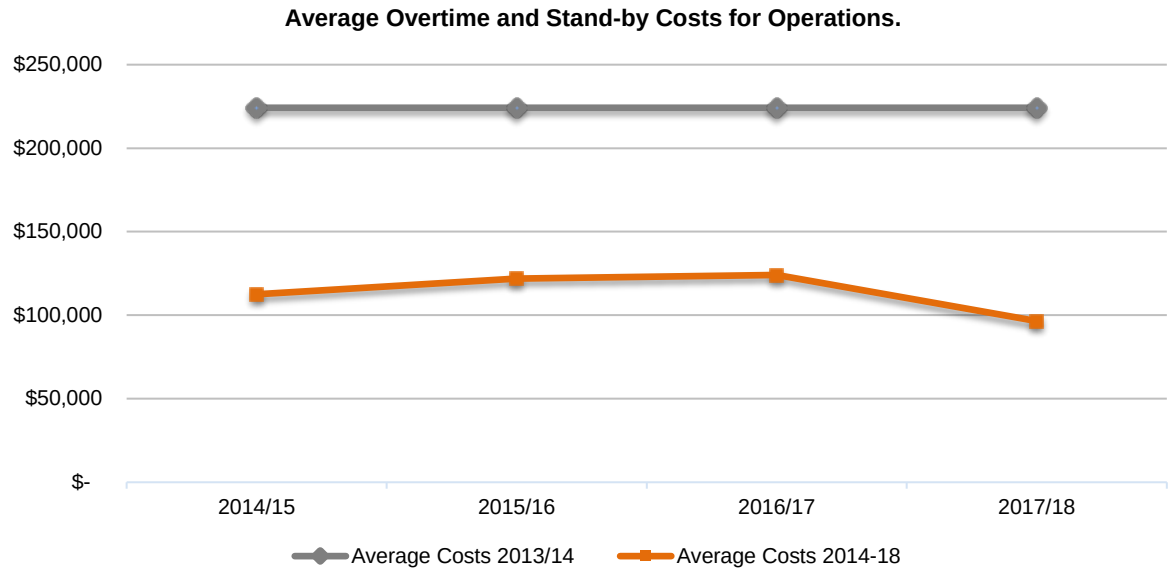



Figure 7.5 shows $224,000 average costs per quarter in 2013-14 compared to $96,000 average costs per quarter in 2017-18 for Essential Water's Operations area. The reduction is due to improvement in operational practises. This has resulted in average savings of $128,000 per quarter compared to 2013-14.

**Figure 7-6: Savings on stand-by and overtime 2017-18 compared with 2013-14 ($ Nominal)**

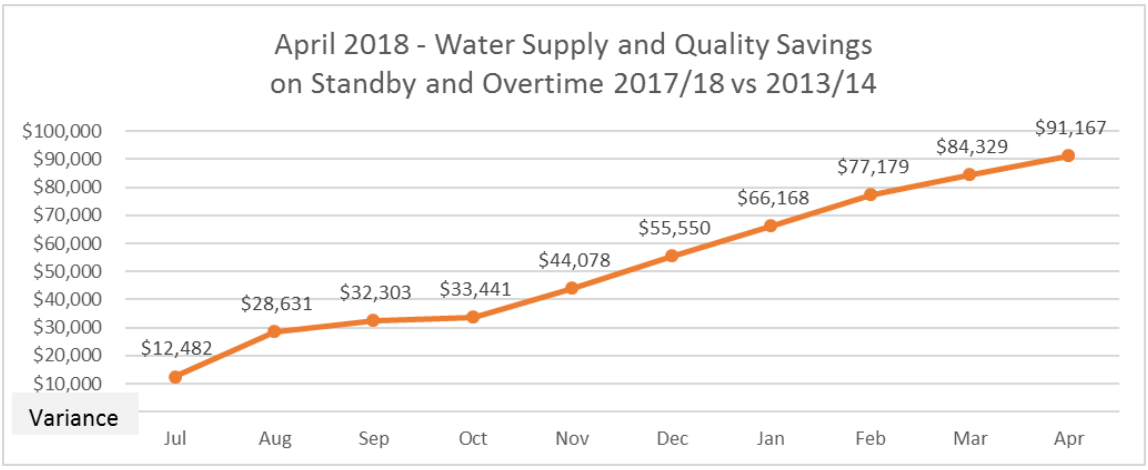
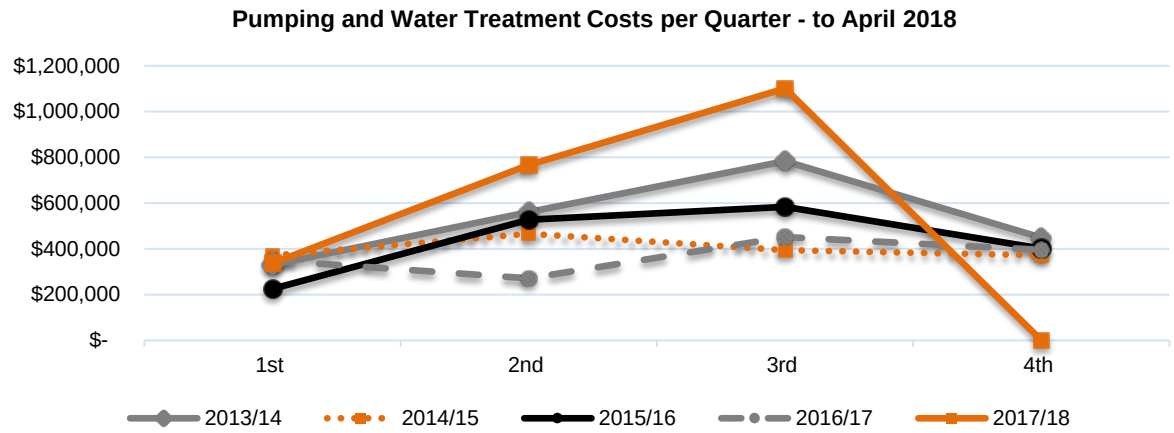


Figure 7-6 shows year to April 2018 cumulative standby and overtime savings of $91,167 compared with 2013/14 for the Water Supply and Quality area.

**Figure 7-7: Pumping and water treatment costs per quarter to April 2018**




As discussed in the following section, Figure 7-7 highlights the increased pumping and water treatment costs experienced in 2017-18 due to a combination of higher electricity prices and increased pumping from the Darling River.

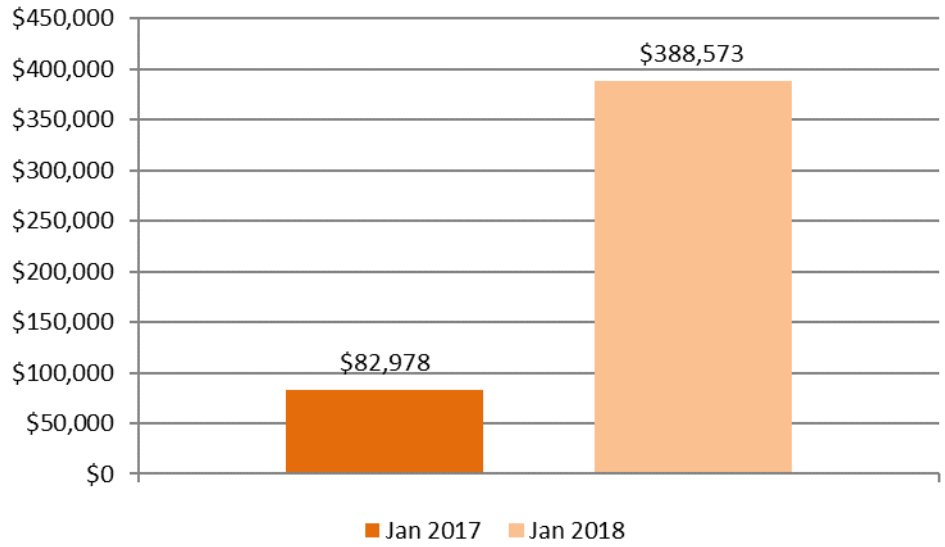
Factors contributing to the higher opex over the current regulatory period include:

- lower than anticipated capital expenditure over the period (as discussed in Chapter 7 'Capital expenditure'). As a result, opex received a larger share of the corporate overheads that are allocated to every dollar spent,
- an increase in electricity prices for the major pumping stations and an increased need to pump during peak energy tariff periods due to the drought (see section 2.4 below),
- an increase in the cost of chlorine (which is produced with electricity) and an increased need for chemical treatment as a consequence of minimal water levels in Menindee Lakes and local reservoirs, and
- consultancy costs for project assessments and business case development associated with the new water supply arrangements, IPART preparation, IWCM strategy and regulatory compliance.

## 2.3 Electricity costs

Electricity costs have increased significantly over the past two years. Essential Water experienced a $0.3 million (368 per cent) increase in its monthly electricity bill between January 2017 and January 2018.

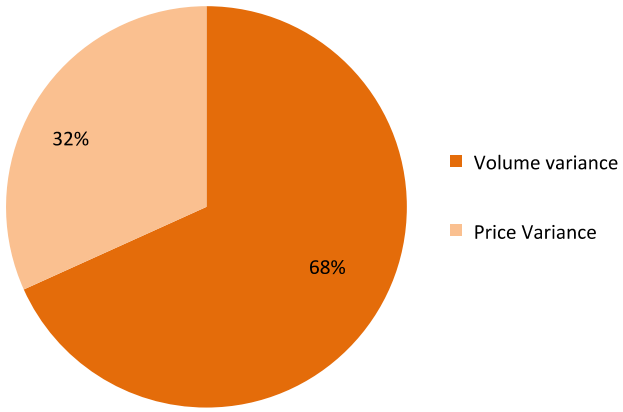
**Figure 7-8: Monthly electricity bills for the region (January 2017 and January 2018) (Nominal $)**




Source: Essential Water analysis.

The significant increase in electricity costs was a result of a 32 per cent price variance and 68 per cent volume variance due to pumping requirements as illustrated in Figure 7-9 below.

**Figure 7-9: Analysis of variance of monthly electricity bills (January 2017 and January 2018)**




Source: Essential Water analysis.

In January 2017, higher water storage levels in Stephens Creek reservoir significantly reduced the need to pump via multiple pumping stations. In January 2018, dam levels became low, and extensive pumping from Menindee was required. At the same time, electricity prices had risen considerably (doubling in many cases), resulting in increased volumes at higher prices, and at peak, rather than off-peak times. The importance of having Stephens Creek operating to ensure access to water supply at low prices is evident in this case study and we expect customers to be better off by continued operation of the reservoir into the future to complement supply from the new pipeline.

Stephens Creek has supplied Broken Hill for approximately half of the time over the past 20 years and maintaining access to low cost water that is either pumped into Stephens Creek from the Wentworth to

Broken Hill pipeline for emergency supply or filled naturally through rainfall from the Stephens Creek catchment area is important to ensure customer tariffs are as low as possible. We maintain that Stephens Creek should remain operational once the new pipeline becomes operational in order to maintain current service levels and to ensure a safe and reliable water supply at an affordable price for the community.

Increases in electricity costs have been reflected in our 2017-18 electricity forecasts and our forecasts for 2018-19, partially explaining why actual costs were higher than IPART's allowances for the current determination period. Our forecasts for electricity during 2019-23 that are directly attributable to Essential Water's pumping costs have reduced in line with the lower volumes forecast as a result of the new bulk water supply arrangements.

Forecast electricity costs for the 2019-23 regulatory period include:

- WaterNSW costs for operating the Wentworth to Broken Hill pipeline,
- the Wentworth to Broken Hill pipeline is planned to be operational at the start of the 2019-23 regulatory period and we expect to be billed separately for electricity costs from WaterNSW as a component of its IPART-approved bulk water transportation tariffs,
- Essential Water pumping costs for the last 21 kilometres of the new pipeline,
- the last 21 kilometres of the Wentworth to Broken Hill pipeline will be 'gifted' to Essential Water from WaterNSW, however we will be responsible for operating and maintenance costs of approximately $0.3 million per annum, which are included in our opex forecasts,
- pumping costs for our reticulation network, and
- we will continue to be responsible for the electricity costs to pump water within our existing reticulation network to ensure customers receive a safe and reliable water supply.

## 2.4 Proposed operating and maintenance expenditure

Essential Water has used the 2018-19 financial year Q3 budget as the base for projecting forecast operating expenditure over the 2019-23 regulatory period. This base year includes a large number of savings initiatives and cost reductions arising through retiring the Sunset Strip membrane plant and meeting supply from a larger water treatment plant at Menindee, as well as operating and maintenance costs associated with the Menindee pipeline and pumping stations.

These savings have reduced overhead rates and, when combined with an increased level of capital expenditure, mean that operating costs are proposed to **reduce** by three per cent in real terms over the next four years compared with IPART's allowances for the 2014 determination.

The following three tables illustrate Essential Water's proposed operating expenditure over the 2019-23 period by category for water services, sewerage services, and the two services combined. Figure 7-10 provides a summary of our proposed opex.

**Table 7-2: Proposed operating expenditure 2019-23 for water services**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Labour | 4,553 | 4,107 | 3,981 | 3,994 | 16,635 |
| Plant Expenditure | 671 | 634 | 645 | 681 | 2,631 |
| Maintenance & Other Contractors | 783 | 744 | 763 | 812 | 3,103 |
| Materials (Excl. Chemicals) | 525 | 499 | 511 | 544 | 2,078 |
| Chemicals | 1,133 | 1,077 | 1,104 | 1,175 | 4,489 |
| Other Opex (Excl. Electricity) | 198 | 188 | 193 | 206 | 786 |
| Electricity | 1,616 | 1,648 | 1,813 | 2,072 | 7,149 |

| | | | | | |
|---|---|---|---|---|---|
| **Direct Costs** | **9,478** | **8,898** | **9,009** | **9,485** | **36,871** |
| Corporate Overheads | 1,706 | 1,602 | 1,622 | 1,707 | 6,637 |
| **Total** | **11,184** | **10,500** | **10,631** | **11,192** | **43,508** |

Source: Essential Water analysis.

**Table 7-3: Proposed operating expenditure 2019-23 for sewerage services**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Labour | 2,027 | 1,925 | 1,971 | 2,098 | 8,022 |
| Plant Expenditure | 236 | 225 | 230 | 245 | 935 |
| Maintenance & Other Contractors | 252 | 240 | 246 | 262 | 999 |
| Materials (Excl. Chemicals) | 65 | 62 | 63 | 68 | 258 |
| Chemicals | 126 | 120 | 123 | 131 | 499 |
| Other Opex (Excl. Electricity) | 141 | 134 | 138 | 147 | 560 |
| Electricity | 85 | 87 | 95 | 109 | 376 |
| **Direct Costs** | **2,933** | **2,792** | **2,866** | **3,058** | **11,649** |
| Corporate Overheads | 528 | 503 | 516 | 550 | 2,097 |
| **Total** | **3,461** | **3,295** | **3,382** | **3,608** | **13,746** |

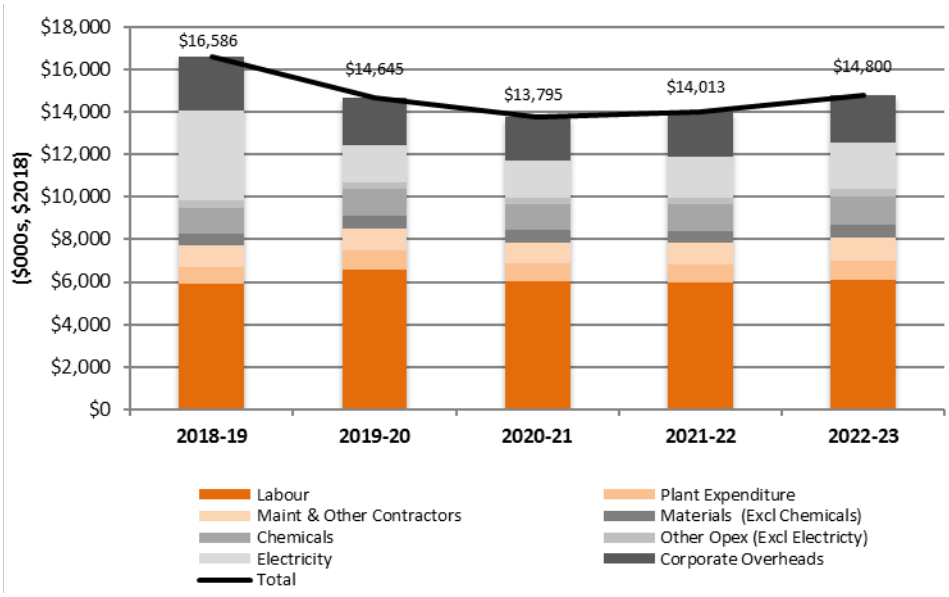
Source: Essential Water analysis.

**Table 7-4: Proposed operating expenditure 2019-23 combined water and sewerage services**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Labour | 6,580 | 6,033 | 5,953 | 6,091 | 24,657 |
| Plant Expenditure | 907 | 858 | 875 | 926 | 3,566 |
| Maintenance & Other Contractors | 1,035 | 984 | 1,009 | 1,074 | 4,102 |
| Materials (Excl. Chemicals) | 590 | 561 | 574 | 612 | 2,336 |
| Chemicals | 1,259 | 1,197 | 1,226 | 1,306 | 4,988 |
| Other Opex (Excl. Electricity) | 340 | 323 | 331 | 352 | 1,346 |
| Electricity | 1,701 | 1,735 | 1,908 | 2,181 | 7,525 |
| **Direct Costs** | **12,411** | **11,690** | **11,876** | **12,543** | **48,520** |
| Corporate Overheads | 2,234 | 2,104 | 2,138 | 2,258 | 14,428 |
| **Total** | **14,645** | **13,795** | **14,013** | **14,800** | **57,254** |

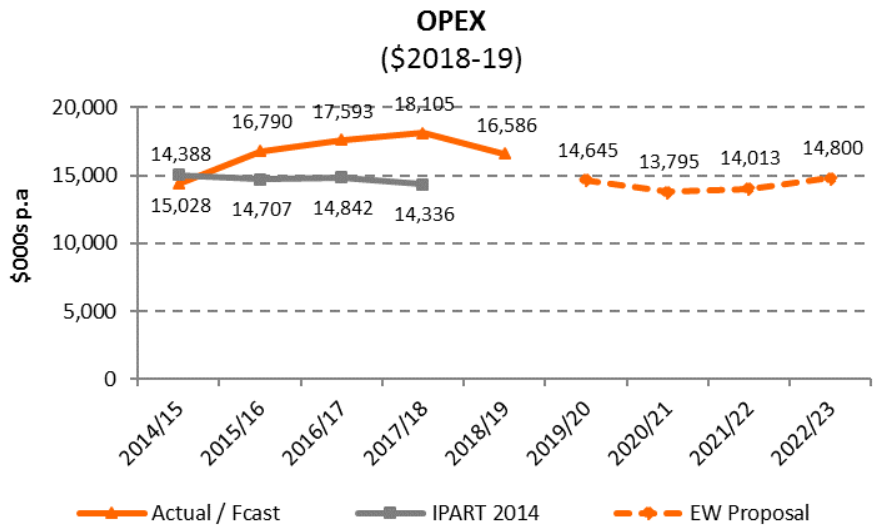
Source: Essential Water analysis

**Figure 7-10: Proposed operating expenditure 2019-23 ($2018-19)**




Source: Essential Water analysis.

**Figure 7-11: Actual and proposed opex ($2018-19)**




Source: Essential Water analysis.

Detailed descriptions of the programs underpinning these operating expenditures are outlined in the following sections.

## 2.5 Operating expenditure programs by driver

The following tables and Figure 7-12 outline our proposed opex program by driver.

**Table 7-5: Proposed operating expenditure by driver – water services**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Reservoirs | 258 | 242 | 245 | 258 | 1,002 |
| Water Pipelines | 411 | 385 | 390 | 411 | 1,597 |
| Water Pumping Stations | 2,423 | 2,275 | 2,303 | 2,425 | 9,427 |
| Water Reticulation | 1,743 | 1,636 | 1,656 | 1,744 | 6,779 |
| Water Treatment Plant | 4,581 | 4,300 | 4,354 | 4,584 | 17,819 |
| Effluent Water | 64 | 60 | 60 | 64 | 247 |
| Corporate Overheads | 1,706 | 1,602 | 1,622 | 1,707 | 6,637 |
| **Total Water opex** | **11,184** | **10,500** | **10,631** | **11,192** | **43,508** |

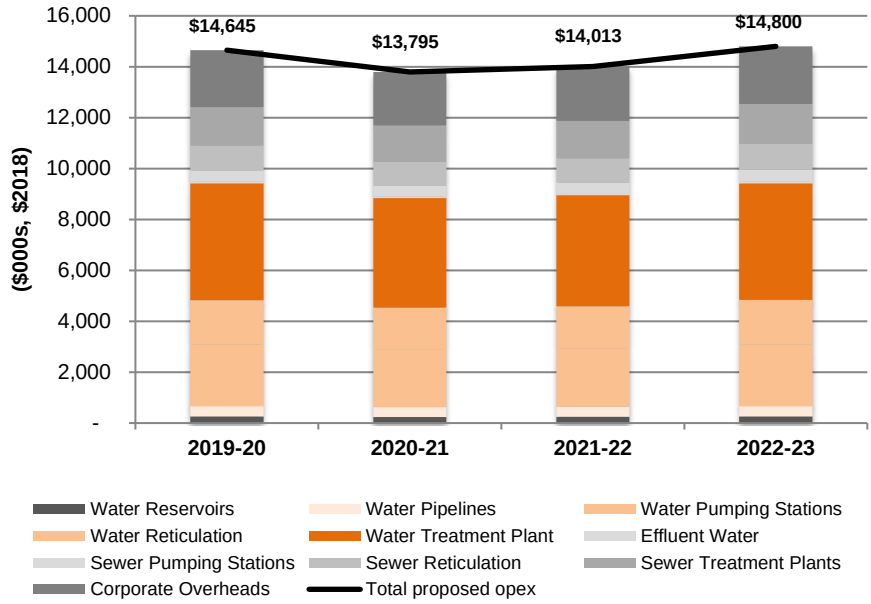
Source: Essential Water analysis

**Table 7-6: Proposed operating expenditure by driver – sewerage services**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Sewer Pumping Stations | 447 | 425 | 436 | 466 | 1,774 |
| Sewer Reticulation | 979 | 932 | 956 | 1,020 | 3,887 |
| Sewer Treatment Plants | 1,508 | 1,435 | 1,473 | 1,572 | 5,988 |
| Corporate Overheads | 528 | 503 | 516 | 550 | 2,097 |
| **Total Sewerage opex** | **3,461** | **3,295** | **3,382** | **3,608** | **13,746** |
| | | | | | |
| **Total - Water and Sewerage opex** | **14,645** | **13,795** | **14,013** | **14,800** | **57,254** |

Source: Essential Water analysis

**Figure 7-12: Proposed opex by driver**




Source: Essential Water analysis

The following sections, in conjunction with Section 2.4 and Section 2.5 above, Attachment 5 'Strategic Business Plan' (Section 7) and Attachment 5 'Water Asset Management Plan' (Section 3.9 and Section 9), outline the justification for the major operating activities by driver as illustrated above. These expenditures are required to meet the service standards as outlined in Section 6 of Chapter 3 'Service standards'.

### Mains and pipelines

***Water*** – Operational activities include patrols and inspections, specialised testing and recording (primarily of wall thickness, pressure and flow measurements), inspection of cathodic protection equipment, noting and logging cathodic protection instrument readings, programmed maintenance including replacement of sections of pipe, patches and repairs or replacement of concrete chairs. Maintenance also includes emergency repairs.

***Sewerage*** – Operational activities include patrols and inspection of the sewerage system. Maintenance activities include clearing blockages and cleanout with high pressure jet and vacuum pumps, emergency and planned repairs and replacement of pipe sections.

### Reservoirs and tanks

***Water reservoirs*** – These costs include inspection, measurement and recording of water levels and quality, inspections and reports associated with dam maintenance and keeping surrounding catchments clear of weeds, tree growth and obstructions. Expenditure also includes inspection and maintenance of associated plant, valves, pipes, buildings and fences.

***Water tanks*** – Costs are associated with inspection and reporting on tank condition, inspection of cathodic protection equipment, noting and logging cathodic protection instrument readings, periodic tank cleanout and inspection and maintenance of associated plant, valves, pipes, buildings and fences. Tanks periodically require exterior painting and repairs to corroded equipment such as hatch covers.

### Pumping stations

***Water*** – Costs are associated with inspection, testing and measurement of the condition of electrical and mechanical equipment. Measurements include pump pressures, flow rates, efficiency, vibration,

and tolerances. Other costs involve repairs to failed plant, lubrication and service of mechanical and electrical plant, inspections, testing and reporting on ancillary services, such as building lights and power, SCADA control, fire-fighting equipment, security and communications equipment. Building and grounds maintenance, station operational requirements, changeover pumps, open/close valves and electricity consumption to operate pumps are covered in this category.

***Sewerage*** – Costs are similar to water but on a smaller scale and involve additional clearance of blockages and cleanout with high pressure jet and vacuum pumps.

### Reticulation

***Water*** – Costs are associated with patrol, inspection and testing (especially for leaks), emergency and planned repairs, systematic operations of reticulation apparatus, valves, and hydrants. Periodic cleanout of pipes with high pressure air injection also falls under this category.

***Sewerage*** – Costs are associated with patrol, inspection and testing (especially for root invasion), emergency and planned repairs, systematic operations of reticulation apparatus, valves, and hydrants. Clearance of blockages and cleanout with high pressure jet and vacuum pumps are also included.

### Water Treatment Plants

The water treatment plant is operated on a 24/7 basis with the following Shift Operator functions:

- act as the after-hours call centre, vetting urgent and non-urgent customer response calls and water and sewerage station faults, calling out after-hours field staff as required or monitoring the situation to determine if response can be delayed until regular working hours,
- offload chemical deliveries, load chemical feeders and respond to chemical feeder problems,
- monitor SCADA alarms, reservoirs, tank storages, sewerage stations and security,
- optimise energy costs by controlling remote pumping stations and water treatment plants in accordance with time of use energy tariffs,
- respond to changes in water quality and demand, undertake routine and emergency water sampling to ensure compliance with the Australian Drinking Water Guidelines and respond to online instrument problems, and
- maintain operational records.

Other costs include inspection, testing and condition monitoring of electrical, mechanical, chemical and filtration equipment. Monitoring includes filtration and pump pressures, flow rates efficiency, vibration, and tolerances extending the time between major overhauls where practical. Repairs to plant failure, lubrication and service of mechanical and electrical plant are covered by this category.

Further costs are associated with building and grounds maintenance, inspection, testing and reporting on ancillary service, such as building lights and power, fire fighting equipment, SCADA, security and communications equipment. Treatment plant operational requirements, changeover pumps, open / close valves and electricity consumption to operate pumps are included in this category.

Reduced operating costs are proposed by supplying treated water to Sunset Strip from a new, slightly larger plant at Menindee. This will permit the retirement of the existing uneconomic Sunset Strip membrane plant and repurposing the site for a tank / chlorine booster and pressure pump.

### Sewerage Treatment Plants

The Wills Street and South Broken Hill treatment plants are manually operated throughout normal working hours, with the operators scheduling, controlling, and switching the pumps, filters, and digesters, as well as transferring and storing sludge from tanks to drying beds, and final storage locations. Operation of the ultraviolet recycled water disinfection system and pumps is also included. Operational costs cover similar items to water, but on a smaller scale.

## 2.6 Corporate overheads

Corporate overheads relate to centralised functions undertaken by Essential Energy on behalf of Essential Water and allocated based on a transparent allocation model. The main components of this relate to information technology, property, billing, finance and safety.

Essential Water is charged according to the AER-approved Essential Energy cost allocation methodology (CAM), which has been developed in accordance with the requirements of both IPART (for Essential Water) and the AER (for Essential Energy). The CAM is based on the following principles:

- costs are directly attributed to, or allocated between, categories of distribution services, based on the substance of the underlying transaction or event, rather than its legal form,
- the same costs are not allocated more than once,
- costs will not be re-allocated between service lines during a regulatory control period,
- direct costs can only be attributed once to a single category of distribution services and shared costs are only allocated once between categories of distribution services,
- shared costs are collated into a pool and allocated across standard control services, alternative control services, unclassified distribution services and unregulated business activities, including water and sewerage services for Essential Water, and
- detailed principles, policies and the approach used to attribute costs directly to categories of distribution services are consistent with the AER's Ring-Fencing Guideline. That is, only costs associated with distribution services are attributed or allocated to distribution services and using the principles set out in the CAM.

Because the vast majority of Essential Energy's revenues are derived from our electricity distribution business, which is regulated by the AER, the CAM is developed according to the requirements contained in the National Electricity Rules and approved by the AER.[37] The shared (i.e. corporate overhead) costs are then allocated to Essential Water according to the AER-approved CAM. This ensures that allocators are derived on a transparent basis and there is no double counting of costs to Essential Water customers.

IPART's principles for cost allocation are largely consistent, with principles contained in the CAM as approved by the AER.

> *Costs should generally be allocated to services on the basis of causality. That is, costs should be allocated to the cost objects that causes the costs to be incurred. However, establishing clear cause-and-effect relationships between costs and cost objects is not always possible (in particular without undue cost and effort), complicating the cost allocation process.*
>
> …
>
> *The difficulty arises with indirect costs (ie, joint or common costs), as the allocation of these costs can involve degrees of subjectivity. These costs are ideally assigned to cost objects on the basis of cost drivers (or allocators). Cost drivers (allocators) should have cause-and effect relationships with the indirect costs being incurred. Cost drivers (or allocators) can be divided into the following three types:*
>
> - *Input based. Allocation is based on the share of the other attributable inputs (eg, direct labour or direct materials).*
> - *Output based. Allocation is based on output indicators such as a given product's share of production or sales volume relative to the total output of the company.*

[37] Essential Energy's latest CAM was approved by the AER on 2 June 2017.

- *Revenue based. Allocation is based on revenues generated by the product in question.*

*An appropriate allocator is one which is transparent, simple and measurable, and where there is a high degree of correlation between the cost and the allocator.*[38]

Essential Water has developed its expenditure forecasts using the AER-approved CAM. In some cases, we have reduced the amount of overheads allocated to the water and sewerage services undertaken by Essential Water if we considered the allocated amounts were not proportional to the size of the business. This has served to reduce the total operating expenditures proposed by Essential Water and has correspondingly reduced the revenues and prices proposed in this submission.

We propose that IPART accepts the use of the AER-approved CAM, adjusted for specific reductions as noted above, as the basis for the allocation of corporate overhead costs to the Essential Water business. We note that there is a practical constraint of implementing changes to the CAM that would result in lower costs being allocated to Essential Water, as we would not be able to re-allocate these costs to the electricity business. In this scenario, these re-allocated costs would become stranded and borne by Essential Water and its shareholder.

Shared costs are those that contribute to more than one service category. Essential Energy puts all project and function costs that cannot be directly attributed to a service category into a shared cost pool, which needs to be allocated between service categories. Shared costs include:

- Regulation,
- CEO office,
- Human Resources (HR) and Industrial Relations (IR),
- Finance, including Internal Audit,
- Information Technology (IT), and
- Operational Health and Safety.

Essential Energy uses one allocator – direct costs – to allocate its shared costs. This allocator is used because it best reflects the way that shared costs are driven across the business and its services.

As discussed below, since 2012 Essential Energy and Essential Water have been on an efficiency drive to significantly lower overhead costs.

Over the 2014 determination period, Essential Water has strived to achieve the 20 per cent corporate allocation rate approved by IPART, noting that this has been a challenge and has contributed to Essential Water spending above IPART's opex allowances.

As indicated in Chapter 7 'Capital expenditures', Essential Water invested at a rate approximately 15 per cent below the IPART approved capex allowance. The lower than budgeted capital spend, resulting largely from uncertainty over the new water supply arrangements and undertaking $13.8 million of emergency drought works (or almost one-third of the approved IPART capex allowance, separately funded by Government and not funded through regulated revenues), resulted in a large amount of under-recovered overhead costs that were allocated to operating expenditures.

By applying the approved CAM and then reducing the allocated amounts to Essential Water's water and sewerage services in some cases, combined with efficiency gains made by Essential Energy over the past few years that has reduced overall costs, we are able to propose a corporate overhead

[38] IPART's Cost allocation guide Water Industry Competition Act 2006 – March 2018. Page 13.

allocation of **18 per cent** over the next regulatory period, representing an efficient and equitable share of overall corporate support costs.

## 2.7 Efficiency programs and initiatives

The efficiency initiatives that Essential Energy and Essential Water have undertaken since 2012 have led to a reduction in overhead costs in the current period. These initiatives include a reduction in staff numbers through a hiring freeze and natural attrition, and reductions in overtime, agency staff, fleet, and travel costs.

Essential Water has incorporated the continued effects of these efficiency initiatives, together with a number of additional efficiency programs and initiatives, into its forecast operating expenditures in order to ensure customers receive value for money in their water and sewerage services. These efficiency initiatives include:

- staff reductions - the planned capital expenditure in the next regulatory period will improve system reliability and reduce long term operating expenditure through a reduction in field staff requirements. Reductions will be achieved through natural attrition. The loss of these staff will also be reflected in a reduction in associated plant and materials costs,
- continued push to reduce overtime,
- reductions in agency staff,
- wage increases to be offset through efficiency gains,
- efficiencies in fleet management, and
- corporate strategy initiatives, such as ‘make every dollar count’.

## 2.8 Risks and assumptions for the opex program

Table 7-7 highlights the major risks and assumptions for forecast opex for the next regulatory period.

**Table 7-7: Major risks and assumptions for the opex program**

| | Assumption / risk | Likelihood | Impact |
|---|---|---|---|
| 1. | **Assumption** - Government will provide financial support to offset water supply costs associated with the Wentworth to Broken Hill pipeline, including the costs arising from the concurrent IPART determination of WaterNSW charges for constructing and maintaining the new pipeline. In the Broken Hill region, customer capacity to pay is limited, as discussed in Chapter 1 'Context and Background'. Water is a critical commodity for evaporative air cooling and control of lead dust in the Broken Hill area.<br>**Risk** – Adequate funding is not provided and operating expenditures will increase above forecast amounts. | Low - Essential Water believes assistance will occur | High - increased debt and 'restricted supply customers' |
| 2. | **Assumption** - Government will provide financial support to maintain supply to Sunset Strip and Menindee pipeline graziers. Menindee pipeline is unreliable and increasing in cost to operate. If minimal flow rates in the large pipeline were delivered to existing customers, the existing Sunset Strip plant would not be able to treat the poor-quality water and there would be an increased high health risk.<br>**Risk** – Government does not provide financial support. | Low - awaiting outcome of funding application | High - operating costs not reflected in revenues |
| 3. | **Assumption** - Operating expenditure expected to stay largely flat with forecast decrease of four staff over the four-year period. Any wage increases are to be absorbed through efficiency gains. | Assumption only | Assumption only |
| 4. | **Risk** - Lower rainfall than expected – the pumping costs associated with full supply from the Wentworth to Broken Hill River compared with some supply from Stephens Creek reservoir will increase cost of water supplied. (Note: the final cost of transporting water from the Wentworth to Broken Hill pipeline is to be determined via the concurrent IPART determination for the WaterNSW costs of constructing and maintaining the new pipeline.) Mitigating actions (e.g. pass through events) are discussed further in Chapter 2. | Possible | Medium |
| 5. | **Risk** – Mines usage – should the mines significantly decrease their treated water usage, the direct and allocated costs associated with providing water to these sites will fall. To the extent that allocated costs will need to be recovered by existing customers, future customer tariffs to these customers would rise. The largest mine has forecast operation into 2030. Mitigating actions discussed further in Chapter 2. | Possible | High |

# 3 OPERATING COST BENCHMARKING

This section provides an analysis of the latest benchmarking *2015-16 NSW Water Supply and Sewerage Benchmarking Report* [39] data.

In summary, the benchmarking analysis suggests the following:

**Water**

- Operational costs are high given the need for significant pumping costs to transport water long distances to Broken Hill and high chemical costs to treat a wide range of poor quality water. This water quality issue should be alleviated to a large extent with the programmed supply from the Murray River.
- The average water usage charge for utilities that offer a flat usage tariff is $2.18 per kilolitre, while the average of all usage charges (including all additional pricing tiers) is $2.75 per kilolitre. Essential Water's current water usage tariff of $1.80 per kilolitre is at the low end of the spectrum, and is, with the exception of Queensland Urban, the lowest of any water network that does not offer an inclining block tariff (where the first block is often priced at a very low level).
- Essential Water's customers faced water restrictions over the full period of the benchmarking analysis (2015-16). While there were some operating cost savings associated with the lower volumes, there were significant impacts on water sales and the financial performance of Essential Water over the 2014 determination period.
- Broken Hill has a very arid climate and customers use a relatively high amount of water, suggesting the associated costs of water supply are relatively higher in the region.
- Essential Water has the highest pumping costs. The result is indicative of increasing aged transfer pipeline costs and energy costs due to the need to transport water a distance of 115 kilometres from Menindee and a 270 metre uphill 'head' lift.
- We face relatively high electricity costs, measured both on a per property basis and per megalitre. This suggests that Essential Water's charges should be relatively higher than other water companies in the State, which is not the case as illustrated in the bill benchmarks shown previously.
- Due to Broken Hill's location in a semi-arid zone, high lead dust area and need to operate evaporative air coolers during summer periods, residential water consumption is one of the highest in the State.

**Sewerage**

- Our residential sewerage bills are relatively low compared with other water utilities in the sample. This suggests that, while bills are relatively low, they may not be recovering the higher costs of servicing Broken Hill customers. Our commercial sewerage trade waste charges are relatively low.
- Our non-residential sewerage usage charge is relatively low compared with other NSW water companies. Essential Water's current sewerage usage tariff of $1.28 per kilolitre is around the middle of the pack, being slightly higher than other NSW water utilities regulated by IPART, but well below the charges levied by two of the interstate utilities. The interstate companies assessed from Queensland, South Australia and the ACT do not offer sewerage usage charges, as is the case with many NSW councils.
- The high level of sewerage network faults (the highest in the study) is consistent with our proposal to continue our sewer pipe replacement and relining program.
- Our sewerage cost per property is below the NSW average. This suggests that the operational model adopted for sewerage is relatively efficient, due largely to a small operational footprint limited to the city of Broken Hill.

[39] Published by NSW Department of Primary Industries *2015-16 NSW Water Supply and Sewerage Performance Monitoring Report*. First published May 2017.

## 3.1 Benchmarking analysis

This section provides a summary of how Essential Water (shown as Essential Energy in the following figures) compares with some of the key performance indicators for all NSW urban water utilities, together with the overall state-wide performance of the NSW regional water utilities based on data from the following NSW Department of Primary Industries report titled '*2015-16 NSW Water Supply and Sewerage Performance Monitoring Report'.* The benchmarking is assessed based on bills and operating characteristics.

### Bill benchmarking – water

**Figure 7-13: Typical residential bill – water supply and sewerage**

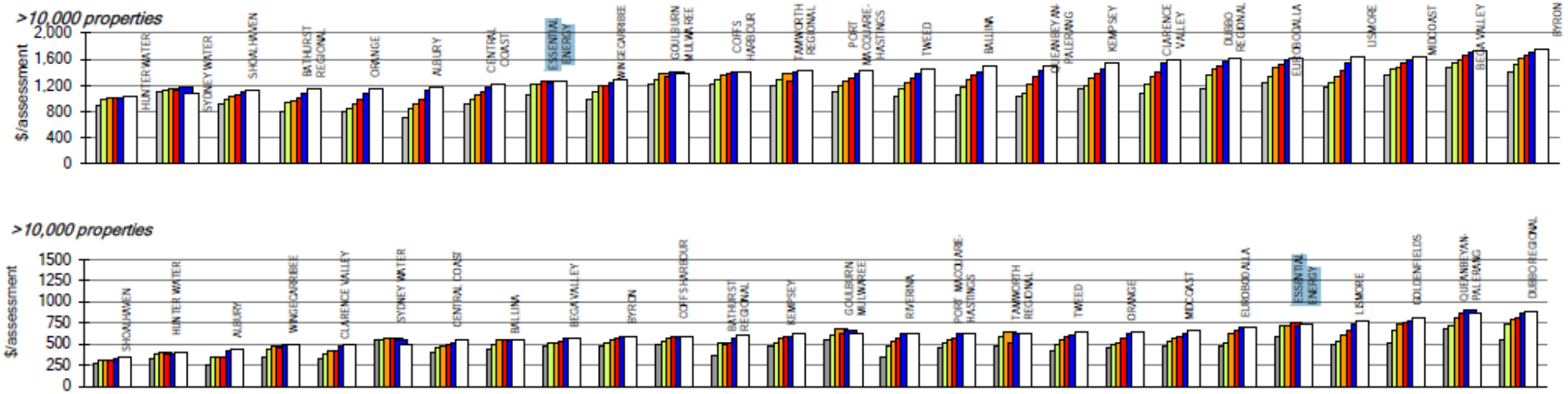
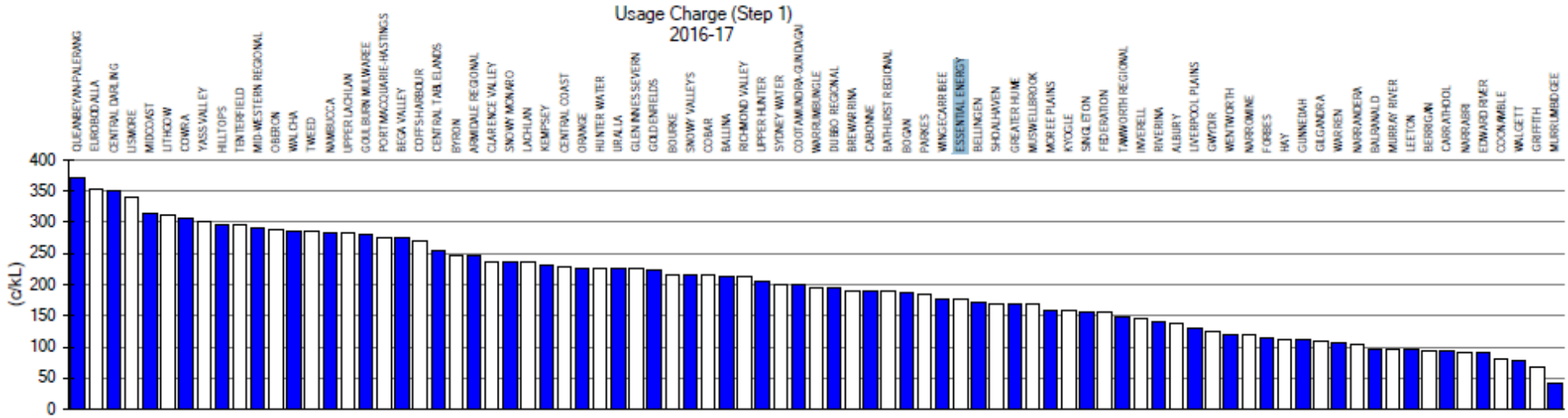


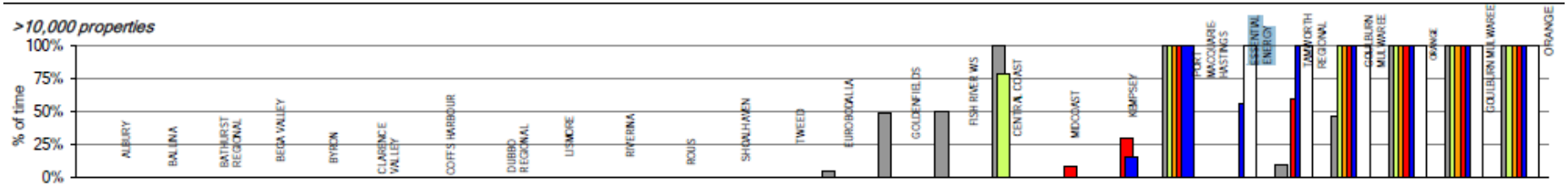
**Figure 7-15: Residential usage charge and access charge – water supply**




The figures above are consistent with the bill benchmarking provided in Chapter 2 ‘Context and background’ that also looks at interstate comparisons. This is also consistent with the analysis provided in section 3.4 of Chapter 12 ‘Tariff structures and price path’, where it was demonstrated that the average water usage charge for utilities that offer a flat tariff is $2.18 per kilolitre, while the average of all usage charges (including all additional pricing tiers) is $2.75 per kilolitre.

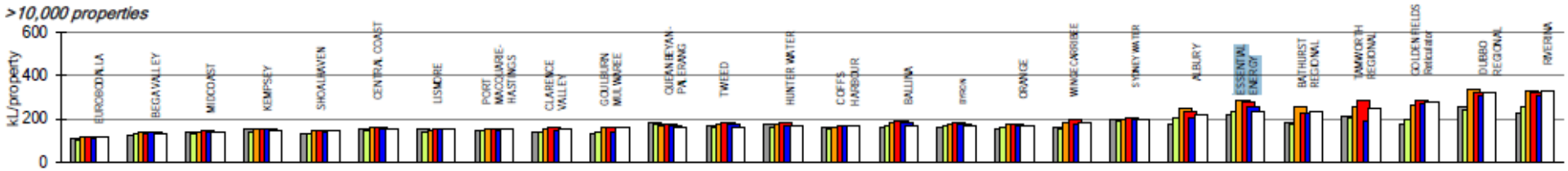
Essential Water’s current water usage tariff of $1.80 per kilolitre is at the low end of the spectrum, and is, with the exception of Queensland Urban, the lowest of any water network that does not offer an inclining block tariff (where the first block is often priced at a very low level).

**Figure 7-16: Drought water restrictions – water supply**




The figure above illustrates that Essential Water's customers faced water restrictions over the full period of the benchmarking analysis (2015-16). While there were some operating cost savings associated with the lower volumes, there were significant impacts on water sales and the financial performance of Essential Water over the 2014 determination period.

**Figure 7-17: Average annual residential water supplied – water supply**




This figure highlights that, as discussed in Chapter 2 'Context and background', Broken Hill has a very arid climate and customers use a relatively high amount of water, suggesting the associated costs of water supply are relatively higher in the region.

**Figure 7-18: Electricity consumption (kWh) per property**

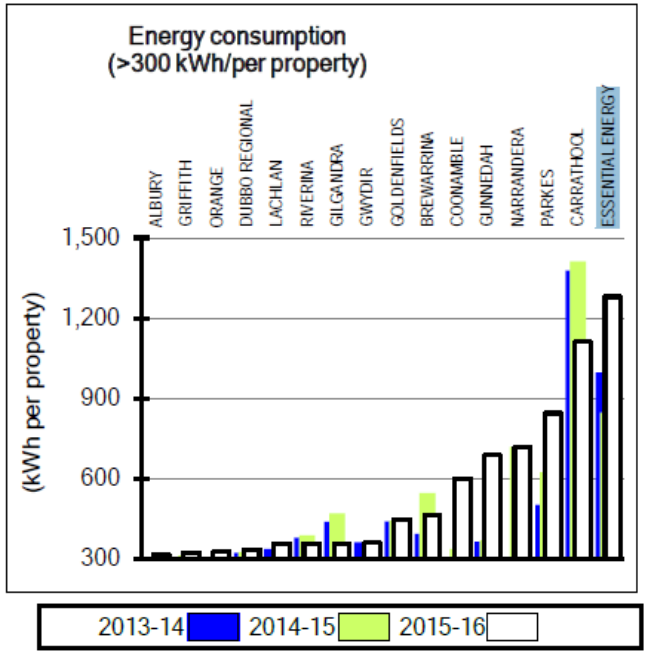
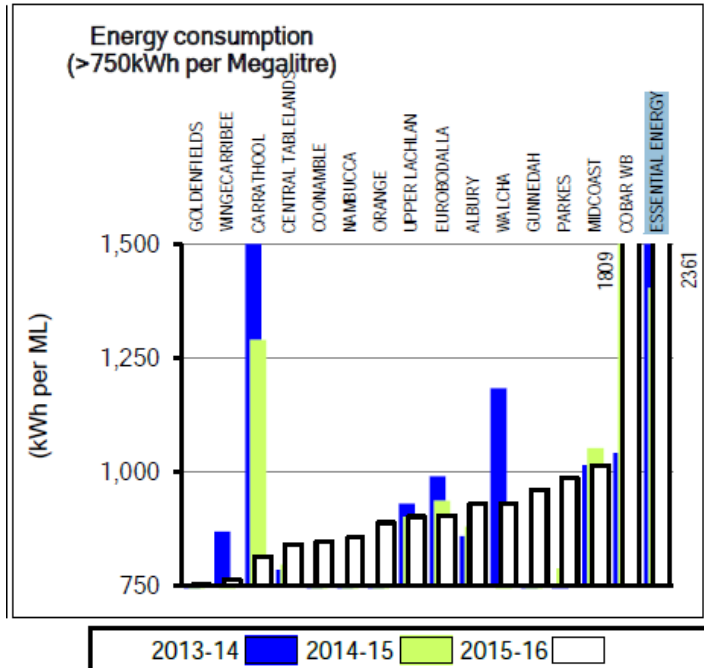
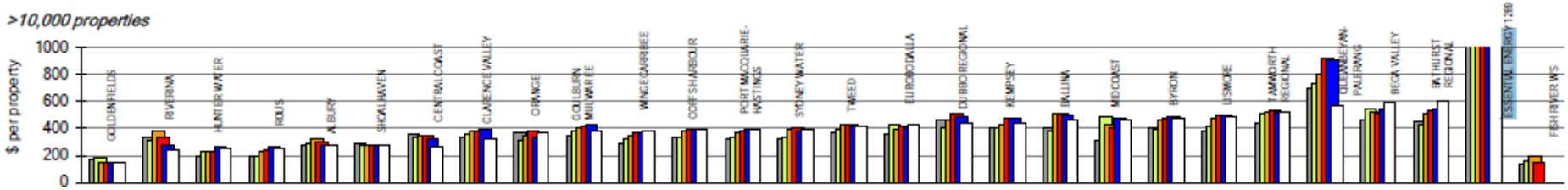



**Figure 7-19: Electricity consumption (kWh) per Megalitre (ML)**



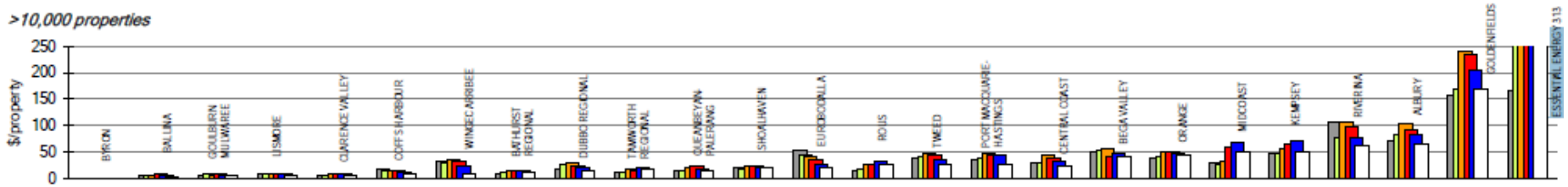

The above charts illustrate that Essential Water faces relatively high electricity costs, measured both on a per property basis and per megalitre. This suggests that Essential Water's charges should be relatively higher than other water companies in the State, which is not the case as illustrated in the bill benchmarks shown previously.

**Figure 7-20: Average annual residential water supplied – water**



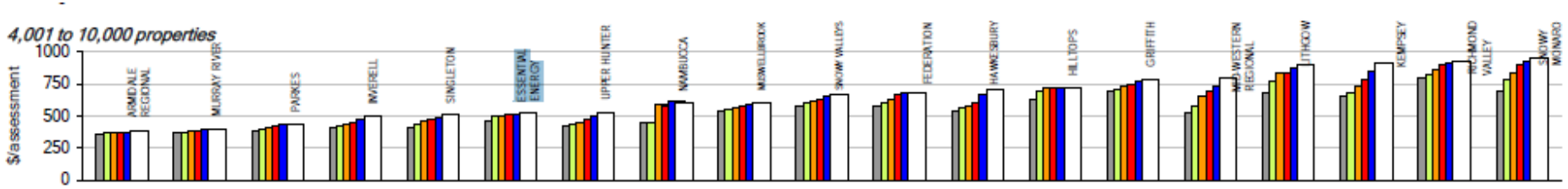

The above figure highlights that, due to Broken Hill's location in a semi-arid climate, high lead dust area and need to operate evaporative air coolers during summer periods, residential water consumption is one of the highest in the State.

**Figure 7-21: Pumping cost per property – water**



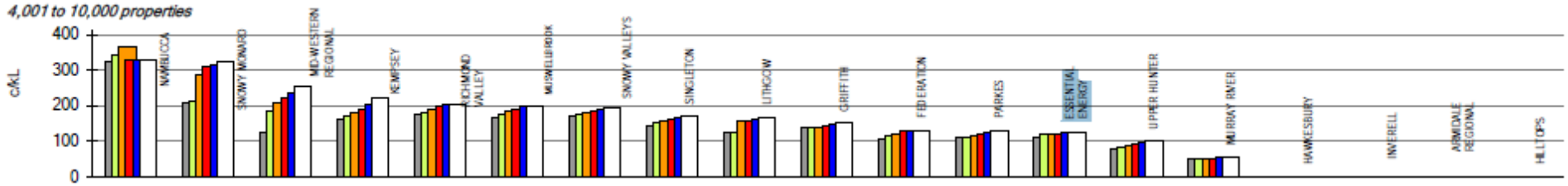

The above chart illustrates that Essential Water has the highest pumping costs. The result is indicative of increasing aged transfer pipeline costs and energy costs due to the need to transport water a distance of 115 kilometres from Menindee (soon to be 270- kilometres from Wentworth) and a 270 metre uphill head lift.

**Bill benchmarking – sewerage**



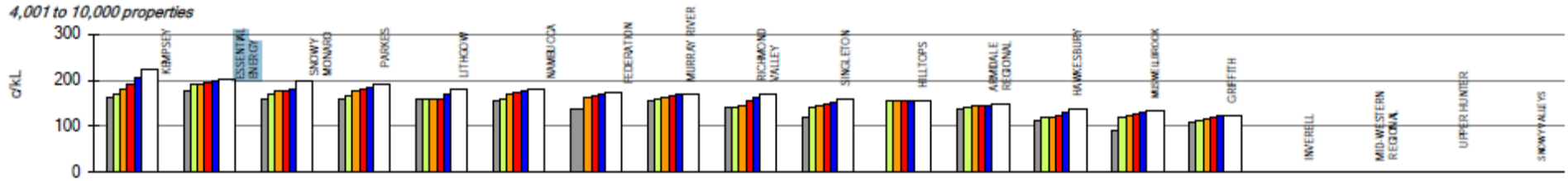

The figure above highlights that Essential Water's residential sewerage bills are relatively low compared with other water utilities in the sample. As discussed previously, this suggests that, while bills are relatively low, they may not be recovering the higher costs of servicing Broken Hill customers.

**Figure 7-23: Non-residential sewer usage charge – sewerage**




The figure above illustrates that the non-residential sewerage usage charge is relatively low compared with other NSW water companies. This is consistent with the analysis provided in Chapter 12 'Tariff structures and price path', where it was demonstrated that the average sewerage usage charge for all businesses assessed is $1.02 per kilolitre, while the average of sewerage usage charges for companies that charge a usage tariff is $1.45 per kilolitre. Essential Water's current sewerage usage tariff of $1.28 is around the midpoint, being slightly higher than other NSW water utilities regulated by IPART, but well below the charges levied by two of the interstate utilities. The interstate companies assessed from Queensland, South Australia and the ACT do not offer sewerage service charges, as is the case with many NSW councils.

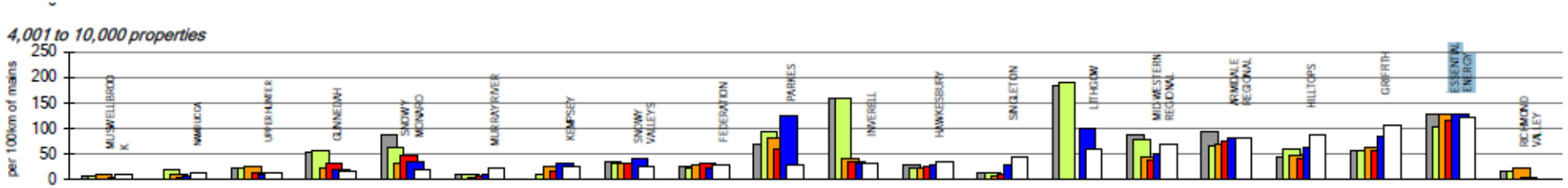
**Figure 7-24: Trade waste usage charge – sewerage**




The figure above highlights that with respect to benchmarking of sewerage tariffs, commercial sewerage trade waste charges are relatively low.

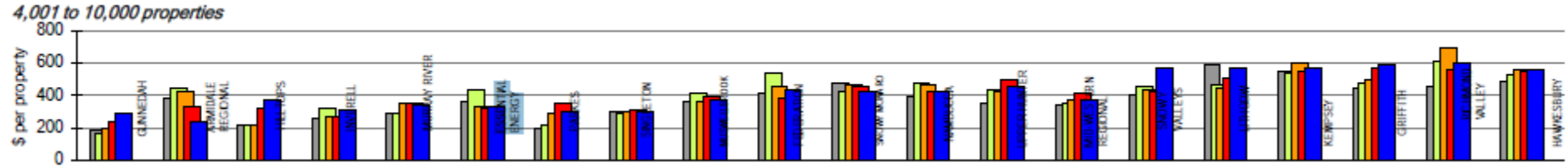
**Operating cost benchmarking – sewerage**

**Figure 7-25: Sewerage main breaks and chokes – sewerage**




The figure above highlights that the high number of sewerage network faults reflects the need to maintain the sewer pipe replacement and relining program.

**Figure 7-26: Operating cost per property – sewerage**




The figure above highlights that the sewerage cost per property is below the average in NSW. This suggests that the operational model adopted for sewerage is quite efficient, due largely to a small operational footprint limited to the city of Broken Hill.

# 4 OPEX SUMMARY

We face cost increases with limited ability for efficiency gains, such as for rising electricity and chemical costs and transporting water long distances, that are largely beyond our control.

We have built efficiencies into our expenditure programs, but efficiencies alone are insufficient to keep prices at current levels while also maintaining acceptable service standards.

We have met these challenges by improving our asset management and business practices to find significant ongoing reductions in our operating and maintenance costs. This is reflected in proposed operating expenditure for 2019-23 that is three per cent **below** IPART's allowances from the 2014 determination in constant dollar ($2018-19) terms.

Our challenge is to continue to address customer affordability, while also ensuring that we have sufficient funding to meet our service standard obligations and achieve financial sustainability.

# Chapter 8 - Regulatory asset base

# 1 SUMMARY

The regulatory asset base (RAB) reflects the written-down value of efficient capital expenditure that Essential Water has incurred to provide water and sewerage services to customers in the Broken Hill region. The RAB provides the basis for calculating both the return on capital and the return of capital (i.e. depreciation), two of the key building blocks that comprise Essential Water's total revenue requirement.

There are two steps involved in calculating the RAB:

- first, determining the opening RAB for the 2019-23 regulatory period, commencing 1 July 2019, and
- second, determining the value of the RAB in each year of the 2019-23 regulatory period from 2019-20 to 2022-23.

This chapter sets out Essential Water's approach to implementing each of these steps and to calculating the RAB for the 2019-23 regulatory period.

**Box 8-1: Key points**

The RAB is calculated using IPART's methodology. The opening value of the combined water and sewerage RAB for 2019-20 is $135 million. The proposed closing value of the RAB for each year of the 2019-23 regulatory period for the combined business RAB is shown in the table below.

**RAB 2019-20 to 2022-23 ($000s, $2018-19)**

| $000 real 2018-19 | Forecast | | | |
|---|---|---|---|---|
| | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Opening value | 135,328 | 147,641 | 165,551 | 180,413 |
| Plus: capital expenditure | 15,413 | 21,322 | 18,604 | 10,329 |
| Less: regulatory depreciation | 3,100 | 3,411 | 3,742 | 3,983 |
| Less: asset disposals | - | - | - | - |
| Plus: indexation | - | - | - | - |
| **Closing value** | **147,641** | **165,551** | **180,413** | **186,758** |

Source: IPART model as populated by Essential Water.

# 2 OPENING RAB FOR 2019-20

## 2.1 Introduction

Essential Water has adopted the standard regulatory approach to establishing the opening RAB for 2019-20, which is consistent with IPART's methodology from the current regulatory period. This involves a roll-forward calculation of the RAB from the last IPART determination. Given that the actual results for 2013-14 were not known at the time of the last IPART determination, adjustments are required to this opening value for differences in capital expenditure, disposals, forecast depreciation and actual indexation.

This calculation is then repeated for each year of the current regulatory period (using forecasts for 2017-18 and 2018-19) to arrive at a forecast closing RAB value for 2018-19, which then becomes the opening RAB value for the 2019-23 regulatory period starting on 1 July 2019.

While actual values are used for net capital expenditure and asset disposals, depreciation is based on forecast capital expenditure from the previous regulatory period. This is consistent with the approach used by IPART in the current determination and in other recent IPART decisions.

The current determination period was extended from four to five years to include 2018-19. The current regulatory period therefore is based on the years 2014-15 to 2018-19, inclusive.

Each of the inputs required to implement the roll-forward calculation is discussed separately below.

## 2.2 Actual efficient net capital expenditure

Actual and forecast efficient net capital expenditure for water and sewerage over the current regulatory period is set out in Table 8-1 below. Chapter 6 'Capital expenditure' provides details of the capital expenditure program, including explanations for the deviations from the efficient capital expenditure that was approved in IPART's determination for the current regulatory period. 'Net capital expenditure' refers to total capital expenditure less capital contributions.

**Table 8-1: Actual and forecast net capital expenditure for 2014-19 ($000s, nominal)**

| $000s nominal | Actual | | | Forecast | |
|---|---|---|---|---|---|
| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
| Corporate | 914 | 590 | 1,743 | 2,188 | 3,825 |
| Water | 3,153 | 4,573 | 1,045 | 3,863 | 9,112 |
| Sewerage | 2,233 | 1,358 | 2,243 | 1,925 | 3,273 |
| **Total** | **6,299** | **6,521** | **5,031** | **7,976** | **16,211** |

Source: Essential Water analysis.

## 2.3 Actual asset disposals

There were no asset disposals in the current regulatory period.

## 2.4 Depreciation

Depreciation is taken from IPART's current determination.

**Table 8-2: Depreciation, excluding inflation ($000s, nominal)**

| $000s nominal | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|---|---|
| Water | 1,420 | 1,497 | 1,610 | 1,757 | 1,757 |
| Sewerage | 681 | 704 | 734 | 775 | 775 |
| **Total** | **2,101** | **2,200** | **2,344** | **2,532** | **2,532** |

Source: Essential Water analysis.

## 2.5 Indexation of the RAB

Consistent with standard regulatory practice, the RAB is indexed to ensure the real value of the RAB is maintained over time. We have used IPART's methodology for measuring actual inflation.

Given the timing of the regulatory proposal in June 2018, the 2017-18 Consumer Price Index (CPI) calculation holds the March 2018 CPI constant for June 2018. This will be updated following the release of the June 2018 CPI figures. For 2018-19, the forecast change in the CPI is set equal to forecast CPI. The RAB roll-forward in the next regulatory period will account for the difference between forecast and actual inflation for 2018–19.

**Table 8-3: Inflation indexation ($000s, nominal)**

| $000s nominal | Actual | | | Forecast | |
|---|---|---|---|---|---|
| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
| Corporate | 16 | 19 | 58 | 117 | 205 |
| Water | 962 | 676 | 1,321 | 1,649 | 1,952 |
| Sewerage | 488 | 341 | 676 | 865 | 1,007 |
| **Total** | **1,467** | **1,036** | **2,055** | **2,631** | **3,165** |

Source: Essential Water analysis.

## 2.6 Opening RAB for 2019-20

The roll forward of the combined business RAB is shown below in Table 8-4. The forecast combined business closing RAB for 2018-19 is $135.3 million. This amount becomes the opening RAB for the upcoming regulatory period commencing in 2019-20.

**Table 8-4: Combined RAB roll forward for the previous regulatory period ($000s, nominal)**

| $000s nominal | Actual | | | Forecast | |
|---|---|---|---|---|---|
| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
| Opening regulatory asset base | 94,162 | 100,309 | 105,665 | 110,408 | 118,484 |
| Plus adjustments for 2013-14 actuals versus forecast | 482 | | | | |
| Revised opening asset base | 94,644 | | | | |
| Plus capital expenditure | 6,299 | 6,521 | 5,031 | 7,976 | 16,211 |
| Less actual depreciation | 2,101 | 2,200 | 2,344 | 2,532 | 2,532 |
| Less asset disposals | - | - | - | - | - |
| Plus indexation | 1,467 | 1,036 | 2,055 | 2,631 | 3,165 |
| **Closing regulatory asset base** | **100,309** | **105,665** | **110,408** | **118,484** | **135,328** |

Source: Essential Water analysis

## 2.7 Asset lives

While the RAB roll-forward calculation does not require asset lives as an input, remaining asset lives are calculated as part of the roll-forward calculation. This is needed because remaining asset lives are required as an input to calculating the value of the RAB for the 2019-23 regulatory period.

The regulatory asset lives for the remaining and standard life of roll forward assets as at 30 June 2019 is detailed in Table 8-5 below. The regulatory lives are as determined by IPART in the 2009 determination.

**Table 8-5: Asset lives for water and sewerage assets**

| Asset lives (years) | Regulatory life at 1 July 2019 | | |
|---|---|---|---|
| | Corporate assets | Water assets | Sewerage assets |
| Remaining life | 23 | 50 | 49 |
| Standard life | 25 | 98 | 89 |

Source: IPART model as populated by Essential Water.

# 3 RAB FOR 2019-23

The RAB for each year of the 2019-23 regulatory period is calculated in the same manner, with the starting point for the RAB calculation being the closing RAB from the roll-forward calculation set out in section 2. The opening RAB is then adjusted for forecast capital expenditure, forecast asset disposals and forecast depreciation. The calculation is repeated for each year of the upcoming regulatory period.

## 3.1 Forecast efficient capital expenditure

Forecast efficient capital expenditure for water and sewerage is set out in Table 8-6 below. Chapter 6 'Capital Expenditure' provides details of Essential Water's forecast capital expenditure program.

**Table 8-6: Forecast capital expenditure ($000s, real 2018-19)**

| $000s real 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|
| Corporate | 3,702 | 4,077 | 3,483 | 2,228 |
| Water | 9,518 | 3,870 | 1,771 | 3,468 |
| Sewerage | 2,193 | 13,375 | 13,350 | 4,633 |
| **Total** | **15,413** | **21,322** | **18,604** | **10,329** |

Source: Essential Water analysis.

## 3.2 Forecast asset disposals

There are no asset disposals forecast for the 2019-23 period.

## 3.3 Forecast depreciation

Forecast depreciation is calculated using the IPART straight-line methodology adopted for the current determination. The straight-line depreciation method allows for an equal proportion of the asset's value to be recovered in each year of its useful life. This approach is simple, transparent and consistent with regulatory practice used by other Australian regulators in the context of water and by the AER in the context of gas and electricity.

Consistent with IPART's current determination, Essential Water has used a weighted average asset life for existing water and sewerage assets and asset specific lives for new capital expenditure based on IPART approved asset lives.

The resulting depreciation forecasts used in the RAB roll-forward are presented in Table 8-7 below.

**Table 8-7: Forecast depreciation ($000s, nominal)**

| $000s real 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|
| Corporate | 521 | 676 | 828 | 942 |
| Water | 1,708 | 1,777 | 1,806 | 1,832 |
| Sewerage | 871 | 958 | 1,108 | 1,210 |
| **Total** | **3,100** | **3,411** | **3,742** | **3,983** |

Source: IPART model as populated by Essential Water.

## 3.4 Our proposed RAB for 2019-23

The RAB for each year of the 2019-23 regulatory period can be calculated using the input values discussed above. The resulting combined business RAB values are presented in Table 8-8 below.

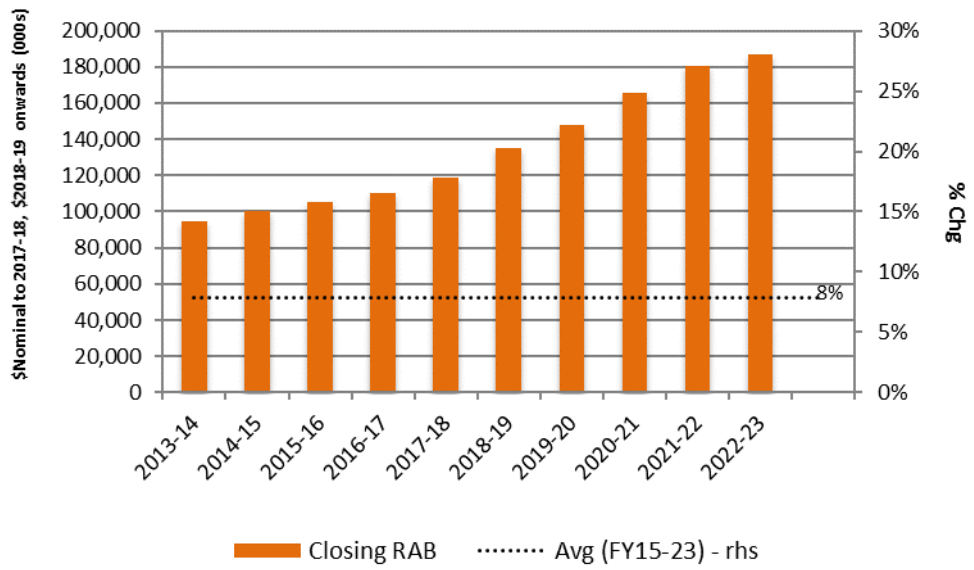
**Table 8-8: Total combined business RAB 2019-23 ($000s, real 2018-19)**

| $000 real 2018-19 | Forecast | | | |
|---|---|---|---|---|
| | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Opening value | 135,328 | 147,641 | 165,551 | 180,413 |
| Plus: capital expenditure | 15,413 | 21,322 | 18,604 | 10,329 |
| Less: regulatory depreciation | 3,100 | 3,411 | 3,742 | 3,983 |
| Less: asset disposals | - | - | - | - |
| **Closing value** | **147,641** | **165,551** | **180,413** | **186,758** |

Source: IPART model as populated by Essential Water.

The proposed closing value of the RAB for each year of the 2019-23 regulatory period for combined water and sewerage services is shown below.

**Figure 8-1: Movements in the RAB from 2013-24 ($000s, $nominal to 2017-18, $2018-19 onwards)**




The closing RAB has increased by approximately eight per cent per year based on the level of capital additions and the impact of inflation outstripping annual depreciation and disposals.

# Chapter 9 - Rate of return

# 1 SUMMARY

The rate of return is the estimated cost of investing in and maintaining safe and reliable water and sewerage services in the Broken Hill region. It covers the cost of servicing our debt and provides a return to our shareholder for its equity investment in our business. It is calculated by multiplying the value of our regulated asset base by the rate of return on capital, also known as the weighted average cost of capital (WACC).

We have estimated the rate of return by applying IPART's February 2018 WACC methodology. The estimate uses financial market information as at 31 January 2018, published by IPART in its Bi-annual WACC Update February 2018. The methodology requires annual updates to the cost of debt during the regulatory period using updated market information, so the WACC estimate proposed is only for the first year of the upcoming determination period, 2019-20.

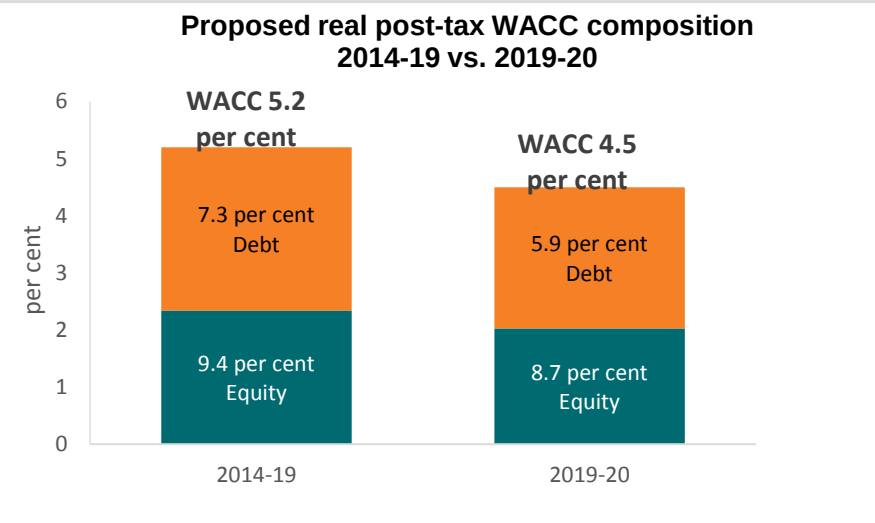
Our proposed rate of return for the first year of the 2019–23 regulatory period is a real post-tax WACC of 4.5 per cent (see Box 1-1). This is lower than our current rate of return of 5.2 per cent, primarily due to a reduction in the risk-free rate (10-year Australian Government bonds) since the beginning of the current regulatory period. Our proposed rate of return reduces to a real post-tax WACC of 4.0 per cent in 2022-23, reflecting estimates of a falling cost of debt over the four-year period.

A final first year WACC will be included by IPART as part of its final determination in early 2019.

**Box 9-1: Key points**

The WACC for Essential Water is calculated using IPART's 2018 WACC methodology.

**Proposed WACC for the first year of the 2019-23 regulatory period.**




Our proposed WACC reflects the efficient cost of capital for a benchmark entity that operates in a competitive market and faces similar risks to our regulated business.

# 2 BACKGROUND

## 2.1 What is the rate of return?

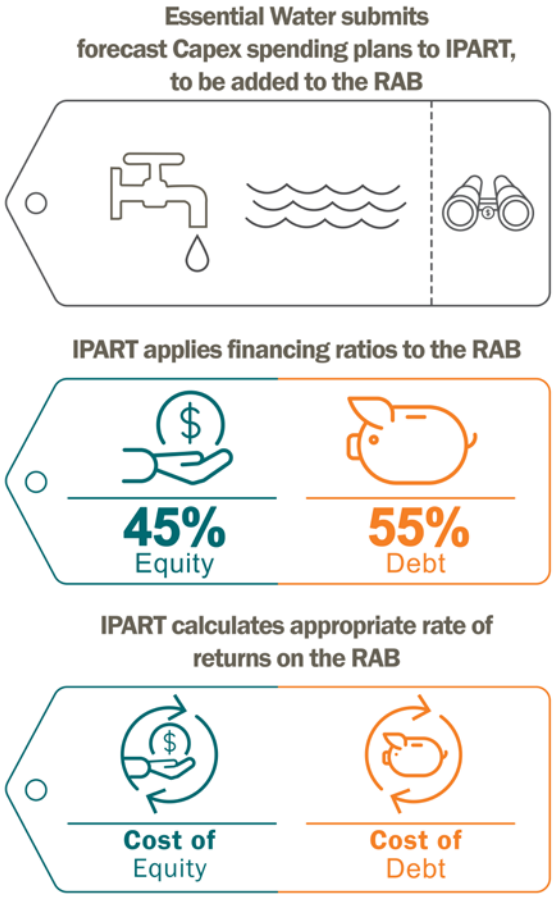
The rate of return is the estimated cost of funding the investment we need to make and maintain a safe and reliable water supply and sewerage services in the Broken Hill region.

Two sources of funds are available: equity and debt. The cost of equity is the return expected by a shareholder. The cost of debt is the interest rate that Essential Water pays when we borrow money to invest.

IPART expects an efficient water business to fund investments at a ratio of 60 per cent debt to 40 per cent equity. However, due to the isolated nature of the Essential Water footprint and the high reliance on a few large customers (mines), a ratio of 55 per cent debt to 45 per cent equity has been used by IPART in the current pricing period and is also proposed by Essential Water in this submission.

When Essential Water invests in assets, the value of the new asset is added to the existing regulated asset base (RAB). The RAB is the depreciated value of all our capital investments related to our water and sewerage infrastructure assets.

The RAB multiplied by the allowed rate of return determines the total cost of capital to be included in customer prices.




## 2.2 Why is it important?

The rate of return makes up approximately a quarter of the revenue allowance that we need to operate and maintain the water supply and sewerage services in the Broken Hill region.

If the rate of return is set too low, we may not be able to secure the funds needed to invest in water supply. This could negatively impact water quality, reliability and the customer service levels we can provide.

If the rate of return of return is set too high, there could be an incentive to over-invest and our customers may pay unreasonably high prices.

# 3 RATE OF RETURN CALCULATION

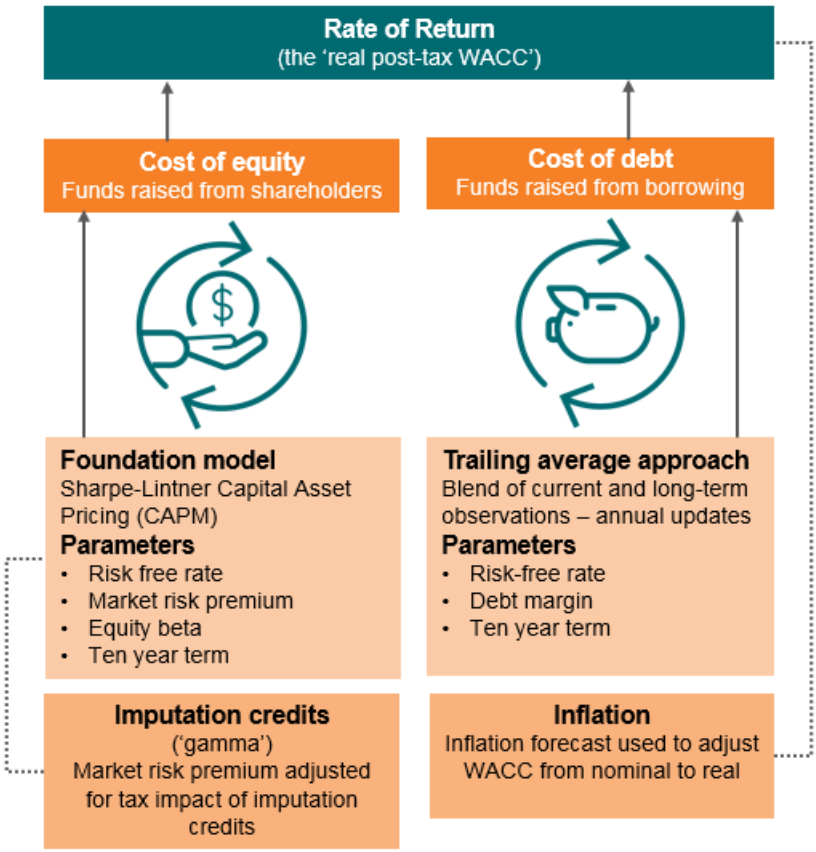
## 3.1 IPART WACC methodology 2018

The diagram below outlines IPART's 2018 WACC determination framework as set out in the current WACC Methodology Review published in February 2018. This method sets out how IPART estimates the cost of debt, cost of equity, inflation adjustments to WACC and the value of imputation credits (gamma).

Essential Water has adopted IPART's 2018 WACC determination framework when calculating the WACC as the basis for the revenues and prices contained in this proposal.

IPART applied a different approach to estimating the WACC for Essential Water in the 2014-19 regulatory period. That was based on the previous WACC Methodology Review published in December 2013, and a subsequent decision relating to debt margins in April 2014.

**Figure 9-1: IPART's 2018 WACC determination framework**




# 4 RATE OF RETURN PARAMETERS

## 4.1 Cost of debt

We propose an estimated **cost of debt of 5.9 per cent for the first year** of the 2019-23 regulatory period (2019-20). This has been calculated using current (40 days) and long-term (10 years) observations of:

- the risk-free rate – 10-year Australian Government bond yields as published by the Reserve Bank of Australia (RBA), and
- the debt margin – the spread between Australian Government Bond yields and those of BBB rated non-financial corporate bonds – as published by the RBA. An additional 0.125 per cent is added onto the spread to cover the costs associated with debt raising.

A current and long-term cost of debt is calculated using the following formula:

- Cost of debt = risk-free rate + debt margin.

The mid-point between the current and long-term cost of debt is then selected, unless there are market extremes occurring which means that IPART may consider moving away from the mid-point (as per IPART's Uncertainty Index included in the 2018 WACC Methodology).

The current placeholder estimate for cost of debt in our proposal is 5.9 per cent for the first year of the regulatory period. This will be updated closer to the beginning of the 2019-23 regulatory period.

### Trailing average

IPART's new methodology uses a 10-year trailing average for the long-term observations of the risk-free rate and the debt margin. In practice, this will result an annual update whereby the oldest 10 per cent tranche of risk-free and debt margin rates (from 10 years ago) is replaced with a new 10 per cent tranche of recently observed rates (from year 0).

Current observations are also updated on a trailing average basis linked to the length of the regulatory period – in this case, four years. However, for the first year of this methodology, 100 per cent of the current rate will still be observed in the 40-day observation period and will transition to a four-year trailing average by replacing 25 per cent of that rate with recently observed rates each year. A four-year current trailing average for will therefore not be fully in place until the regulatory period commencing 1 July 2023.

### Pass-through of annual changes

The annual updates to the cost of debt (and resulting WACC) can either be passed through as part of the annual pricing changes to customers or can be trued up in the next regulatory period, ensuring that both options are equivalent in present value terms (discounted by the WACC rate).

IPART has indicated that it will decide on the option to be undertaken by Essential Water to pass through the annual updates to the cost of debt as part of the review process.

Essential Water's preference is to apply the annual updates to the cost of debt as part of the annual price change process, as:

- annual updates are already required to the annual price change process to give effect to actual measures of inflation, and an additional annual update for the cost of debt is a straightforward exercise (we note that the Essential Energy electricity business already applies annual updates to the cost of debt as part of its annual pricing process as part of implementing the AER's electricity determination, with the process being mechanistic and administratively simple), and
- applying annual updates to reflect changes in the cost debt is more likely to mitigate against price shocks for customers, as the alternative approach of aggregating the annual changes and applying the balance at the subsequent reset may institutionalise greater price volatility at the commencement of each determination period.

## 4.2 Cost of equity

We propose an estimated **cost of equity of 8.7 per cent** for the 2019-23 regulatory period. This has been calculated using current (40 days) and long-term (10 years) observations of:

- the risk-free rate – 10-year Australian Government bond yields,
- equity beta – measures the sensitivity of a business's return compared to upturns and downturns in overall market returns. A beta below one indicates less sensitivity to market movements, and
- the market risk premium (MRP) – expected return above the risk-free rate for an investor to invest in a well-diversified portfolio of risky assets. The premium is adjusted by IPART to account for imputation credit benefits.

The Shape-Lintner Capital Asset Pricing Model is the foundation model used by IPART to determine the current and long-term cost of equity, using the following formula:

- Cost of equity = risk-free rate + equity beta x market risk premium.

The mid-point between the current and long-term calculations is then selected, unless there are market extremes occurring (as per IPART's Uncertainty Index) which means that IPART may consider moving away from the mid-point.

## 4.3 Gearing

IPART typically adopts a mid-point gearing level (debt to debt-plus-equity ratio) of 60 per cent for regulated water businesses. However, IPART applied a gearing level of 55 per cent for Essential Water in the current regulatory period. This accounted for the higher relative risk compared to metropolitan water utilities due to the characteristics of the market that Essential Water operated in.

In 2014, Essential Water faced falling water demand due to a declining population in a geographically isolated region. In addition, there was a high degree of customer concentration risk from a few large customers (mines) and little opportunity for substitution if Essential Water's services and supply were no longer required. These factors were identified by IPART as reasons for the higher relative level of risk Essential Water faced when compared to other metropolitan water utilities. IPART's decision to alter the gearing level from the typical 60 per cent mid-point to 55 per cent recognised this higher risk.

In 2018, Essential Water continues to operate in a market with the same characteristics that existed in 2014, and these characteristics are not expected to change over the next four years. Essential Water therefore proposes that a mid-point **gearing level of 55 per cent** remains appropriate for the higher relative risk that Essential Water continues to face in the 2019-23 regulatory period.

## 4.4 Value of imputation credits

The observed equity returns that IPART uses to estimate the market risk premium are taken after corporate tax. However, the observed equity returns do not take account of the franking credit benefits that Australian investors receive. To take account of this benefit, IPART's current MRP estimates make an implicit adjustment for dividend imputation. This adjustment assumes a value of imputation credits (gamma) of 0.25, in line with IPART's standard WACC method.

The value of imputation credits effectively reduces projected revenues so they more closely reflect the impact of franking credit benefits that Australian investors receive. The higher the value of imputation credits (ranging from 0 to 1, or 0 per cent to 100 per cent) in a determination, the lower the revenues the business can expect to receive in compensation for paying corporate income tax.

Gamma is directly applied by IPART in its post-tax framework by reducing the corporate tax allowance for the impact of the imputation credits (see Chapter 10 'Corporate income tax' for further detail). IPART's February 2018 WACC guideline specified the **value of gamma as 0.25** and this has been used by Essential Water in determining the revenues and prices contained in this submission.

## 4.5 Value of inflation

We have used the estimated average annual rate of expected inflation over a 10-year period to align with the term of the rate of return. Essential Water accepts the use of IPART's current approach to estimating expected inflation for this proposal, which is based on the geometric average of 10 annual expected inflation rates. This calculation uses the latest RBA forecast of inflation (as published in its Statement of Monetary Policy) for the first year of the 2019-23 regulatory period and the mid-point of the RBA's inflation target band for the remaining nine annual rates.

The current placeholder estimate for this proposal is an **inflation estimate of 2.50 per cent** per annum, which will be updated closer to the beginning of the 2019-23 regulatory period. This is consistent with Appendix C as contained in *IPART's Review of Essential [Water's] Prices from 1 July 2019 – Submission Information Package* provided to Essential Water on 22 December 2017 for converting 2017-18 dollars into 2018-19 dollars.

# 5 OUR PROPOSAL

## 5.1 Estimated rate of return

Essential Water has adopted IPART's WACC Methodology published in February 2018. This has resulted in a real post-tax WACC of 4.5 per cent being estimated for the first year of the upcoming regulatory period (2019-20). This rate will be updated for the final determination using financial market data observed closer to the start of the 2019-23 regulatory period. This compares to a current real post-tax WACC for Essential Water of 5.2 per cent.

The main difference in WACC rates between this proposal and the current determination is due to changes in the 10-year Australian Government Bond rate (risk-free rate), which is used to calculate both the debt and equity components of WACC. There has been a 24 per cent reduction in the risk-free rate, which has led to a 13 per cent reduction in the WACC estimate and results in downward pressure on customer prices. However, the current low interest rate environment may not continue in the long term. Bond rates may return to higher levels, affecting the WACC and customer prices in the future.

There are also annual updates to the cost of debt within the regulatory period, which will result in WACC changes in all years after 2019-20.

## 5.2 WACC parameters (mid-point)

**Table 9-1: Current and proposed WACC parameters**

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

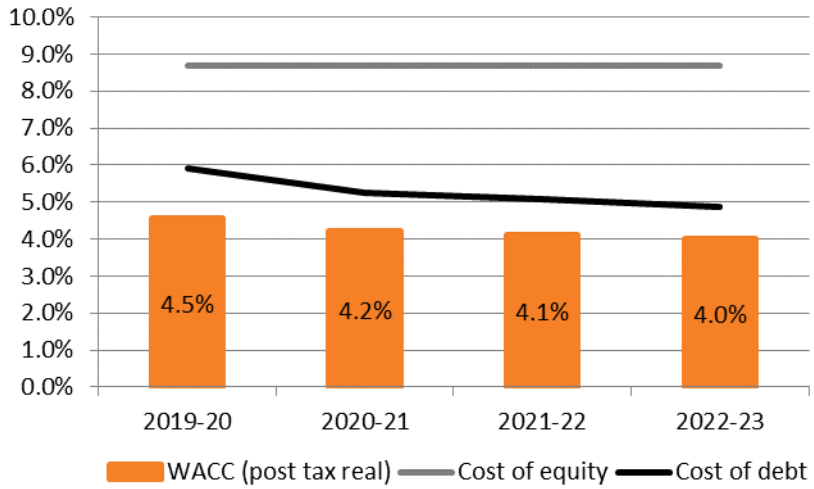
Source: IPART, Essential Water analysis.

* Updated annually for cost of debt components.

^ Includes 0.125 per cent for debt raising costs.

The following figure outlines the annual WACC values assumed by Essential Water in our calculation of proposed revenues and prices in this submission. The WACC reduces by 12 per cent during 2019-23, reflecting estimates of a falling cost of debt over the four-year period.

**Figure 9-2: Proposed WACC values 2019-23**




Source: Essential Water analysis.

Essential Water supports IPART's overall approach to estimating the WACC for water and sewerage services and the objective of setting a WACC that reflects the efficient cost of capital for a benchmark entity that operates in a competitive market and faces similar risks to our regulated business.

# Chapter 10 - Corporate income tax

# 1 SUMMARY

In a post-tax framework, corporate income tax expenses are included as one of the building blocks that make up Essential Water's total revenue requirement. IPART includes an explicit allowance for tax, because it uses 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.

This chapter sets out Essential Water's approach to calculating the total tax allowance for the regulatory period commencing 1 July 2019.

**Box 10-1: Key points**

The methodology for calculating the total tax allowance mirrors that used in IPART's 2014 determination for Essential Water. The resulting tax allowance to be included in the notional revenue requirement for the upcoming regulatory period is presented below.

**Table 10-1: Total tax allowance 2019-23 ($000s, $2018-19)**

| $000 $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Water | - | - | 340 | 387 | 727 |
| Sewerage | 234 | 231 | 265 | 282 | 1,011 |
| **Total** | **234** | **231** | **605** | **668** | **1,738** |

Source: Essential water analysis.

# 2 TOTAL TAX ALLOWANCE

IPART calculates the tax allowance for each year by applying a 30 per cent statutory corporate tax rate adjusted for franking credits to the business's (nominal) taxable income.[40] The adoption of a corporate tax rate of 30 per cent is consistent with the rate expected to be applicable in the upcoming regulatory period to the benchmark efficient entity that is applied in estimating the WACC and net tax liabilities (see Chapter 9 'Rate of return and forecast inflation'), being a firm operating in a competitive market and facing similar risks to the regulated business.

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 tax regulatory asset base (RAB).

The total tax allowance is calculated following the same methodology as used in the IPART 2014 determination for Essential Water as follows.

[40] Under IPART's post-tax framework, the value of franking credits (gamma) enters the regulatory decision directly only through the estimate of the tax liability.

Total tax allowance =

Regulatory notional revenue requirement (excluding tax liability)
− Operating expenditure
− Tax depreciation
− Interest expense
= Taxable income
− Accumulated tax losses
= Taxable income after tax losses
x Adjusted corporate tax rate[41]
= Tax before adjustment for franking credits
− Adjustment for franking credits
**= Total tax allowance**

Each of these inputs is determined as follows:

- the calculation of the notional revenue requirement is set out in Chapter 11 'Revenue requirement',
- cash and in-kind contributions, such as gifted assets and capital contributions are included in recognition of the tax liabilities associated with these items. Essential Water is not forecasting any cash or in-kind contributions,
- interest expenses are calculated by multiplying the RAB by the cost of debt, adjusted for the level of gearing (i.e. the share of debt funding) as discussed in Chapter 9 'Rate of return',
- the approach used for estimating operating expenses is discussed in Chapter 7 'Operating expenditure', and
- previous year losses are the accumulated tax losses from prior years. If the taxable profit calculated above (excluding previous yer losses) results in a loss, then these losses are carried forward and tracked over time.

The adjustment for gamma is discussed in section 2.2.

## 2.1 Tax on gifted assets

Gifted assets are assets that utilities receive for free, usually from developers. Gifted assets 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 gifted assets.[42] We are not forecasting any gifted assets from developers.

We do not believe that there will be any tax implications resulting from any gifted assets associated with the new Wentworth to Broken Hill pipeline.

## 2.2 Tax imputation credits

Under the Australian taxation system, tax credits (imputation credits) created by an Australian company may be redeemed by domestic shareholders. An imputation credit is created for each dollar of eligible tax paid by companies. Imputation credits are distributed to shareholders through the

[41] Calculated as Taxable Income x T / (1-T(1- $\gamma$)), where T is the corporate tax rate (0.30) and $\gamma$ is the value of franking credits(gamma, 0.25) .

[42] Section 21A, Income Tax Assessment Act 1936. See IPART, The incorporation of company tax in pricing determinations – Final Decision, December 2011, p 15.

payment of franked dividends. Imputation credits therefore represent a benefit to domestic shareholders for their investment in the company in addition to dividends.[43]

Investors should be prepared to accept a lower rate of return for an investment with imputation credits attached than if there were no imputation tax credits attached. If the benefit to domestic shareholders of imputation credits is not taken into account, the amount of revenue required to provide an appropriate return to investors would be overstated.

While Essential Water, as a publicly owned business, does not pay out franked dividends, an adjustment for the value of imputation credits is required to maintain consistency with the benchmark efficient entity approach (see Chapter 9 'Rate of return'). This is consistent with the 2014 IPART decision where an adjustment was made to the tax allowance for imputation credits.

IPART's February 2018 rate of return guideline[44] adopted a value of 0.25 for imputation credits.

**Value of imputation credits**

The regulatory approach generally used in Australia to account for imputation credits is to reduce the estimated amount of corporate tax by the value of imputation credits (represented by the Greek letter '$\gamma$', gamma).

Gamma is always less than one, reflecting the following factors:

- companies generally do not distribute all profits as dividends,
- foreign investors are not able to redeem imputation credits,
- some Australian investors cannot utilise imputation credits,
- shareholders entitled to utilise imputation credits do not always do so, and
- shareholders that do utilise imputation credits may not value them at the full face value.

Gamma is calculated as the distribution rate (the value of imputation credits distributed by a firm as a proportion of the value of imputation credits generated by it) multiplied by the utilisation rate, also referred to as 'theta' (the value of imputation credits distributed to investors as a proportion of their face value).

Essential Water proposes a **value of 0.25 for imputation credits**, consistent with IPART's stated approach, based on a distribution rate of 0.7 and a utilisation rate of 0.35.

## 2.3 Total tax allowance

The resulting net tax expenses used in calculating maximum allowed revenues are set out below. This calculates the taxable income after tax losses, multiplies the taxable income after tax losses by the adjusted corporate tax rate (described in Footnote 13) and adjusts the tax payable by the value of imputation credits. The total tax allowance is shown in the tables below.

[43] Imputation credits are of no value to foreign shareholders and not all credits distributed to domestic shareholders are redeemed.

[44] IPART's February 2018 Final Report titled *Review of our WACC Method*, page 76.

**Table 10-2: Taxable allowance for water ($000s, $nominal)**

| $000s, $Nominal | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Notional revenue requirement (excl. tax) | 17,772 | 17,707 | 18,446 | 19,600 | 73,525 |
| Less: | | | | | |
| Operating expenditure | 11,464 | 11,031 | 11,449 | 12,354 | 46,298 |
| Tax depreciation | 1,806 | 1,894 | 1,930 | 1,963 | 7,593 |
| Interest expense allowance | 3,126 | 3,461 | 3,654 | 3,812 | 14,053 |
| Taxable income | 1,376 | 1,321 | 1,414 | 1,470 | 5,581 |
| Less tax accumulated tax losses | 2,850 | 1,474 | 153 | 0 | 4,476 |
| Taxable income after tax losses | 0 | 0 | 1,261 | 1,470 | 2,731 |
| Tax before adjustment for franking credits | 0 | 0 | 488 | 569 | 1,057 |
| Less: Adjustment for franking credits | 0 | 0 | 122 | 142 | 264 |
| **Tax allowance** | **0** | **0** | **366** | **427** | **793** |

Source: Essential Water analysis

**Table 10-3: Tax allowance for sewerage ($000s, $nominal)**

| $000s, $Nominal | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Notional revenue requirement (excl. tax) | 6,824 | 7,143 | 8,178 | 9,135 | 31,280 |
| Less: | | | | | |
| Operating expenditure | 3,548 | 3,462 | 3,642 | 3,983 | 14,634 |
| Tax depreciation | 855 | 964 | 1,149 | 1,275 | 4,244 |
| Interest expense allowance | 1,596 | 1,880 | 2,404 | 2,807 | 8,688 |
| Taxable income | 825 | 837 | 982 | 1,071 | 3,714 |
| Less tax accumulated tax losses | 0 | 0 | 0 | 0 | - |
| Taxable income after tax losses | 825 | 837 | 982 | 1,071 | 3,714 |
| Tax before adjustment for franking credits | 319 | 324 | 380 | 415 | 1,438 |
| Less: Adjustment for franking credits | 80 | 81 | 95 | 104 | 359 |
| **Tax allowance** | **239** | **243** | **285** | **311** | **1,078** |

Source: Essential Water analysis

**Table 10-4: Total tax allowance summary ($000s, $nominal)**

| $000s, $Nominal | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Water | 0 | 0 | 366 | 427 | 793 |
| Sewerage | 239 | 243 | 285 | 311 | 1,078 |
| **Total** | **239** | **243** | **651** | **738** | **1,871** |

Source: Essential Water analysis

Converting the nominal tax allowances in Table 10-4 to real ($2018-19) dollars[45] results in the tax allowances provided in Table 10-5. These allowances are used in the build-up of our notional revenue requirements as outlined in Chapter 11 'Revenue requirements'.

**Table 10-5: Total tax allowance summary ($000s, $2018-19)**

| $000s, $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Water | 0 | 0 | 340 | 387 | 727 |
| Sewerage | 234 | 231 | 265 | 282 | 1,011 |
| **Total** | **234** | **231** | **605** | **668** | **1,738** |

Source: Essential water analysis.

[45] As notional revenue requirements are shown in dollars excluding inflation (i.e. real, $2018-19), the nominal figures in Table 10-5 need to be deflated using the year-on-year forecast change in inflation (assumed to be 2.5%).

# Chapter 11 - Revenue requirements

# 1 SUMMARY

This chapter sets out Essential Water's approach to calculating the notional revenue requirement. The resulting impact on our financial viability is also presented.

As outlined in Chapter 2 'Form of regulation', we propose the use of a building block approach to calculate Essential Water's notional revenue requirement in each year of the determination period, based on IPART's methodology from the 2014 determination. This represents our view of the total efficient costs over the determination period, including:

- the revenue required for operating expenditure,
- an allowance for a return on assets,
- an allowance for a return of assets,
- an allowance for meeting tax obligations, and
- an allowance for working capital.

Next, we propose the target revenue for each year – that is, the amount of revenue that price levels are set to generate. This revenue is not necessarily the same as the notional revenue requirement, as we sometimes target more or less than this revenue to achieve smoother pricing outcomes for our customers across the regulatory period.

Finally, we estimate the amount of revenue we expect Essential Water to generate from trade waste services and a range of other fees and charges. We subtract this amount from the target revenue so that prices for water and sewerage services only recover the costs of providing these services.

Chapter 6 'Capital expenditure', Chapter 7 'Operating expenditure', Chapter 8 'Regulatory asset base', Chapter 9 'Rate of return' and Chapter 10 'Corporate income tax' discuss in detail the components that comprise the notional revenue requirement.

**Box 11-1: Key points**

Essential Water's proposed notional and target revenue are shown in the table below:

**Proposed notional and target revenue requirement 2019-23 ($000s real 2018-19)**

| $000 $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Notional revenue requirement | 24,230 | 23,884 | 25,327 | 26,701 | 100,142 |
| Target revenue | 23,061 | 24,351 | 25,713 | 27,149 | 100,274 |

Source: IPART model as populated by Essential Water

# 2 NOTIONAL REVENUE REQUIREMENTS

## 2.1 Introduction

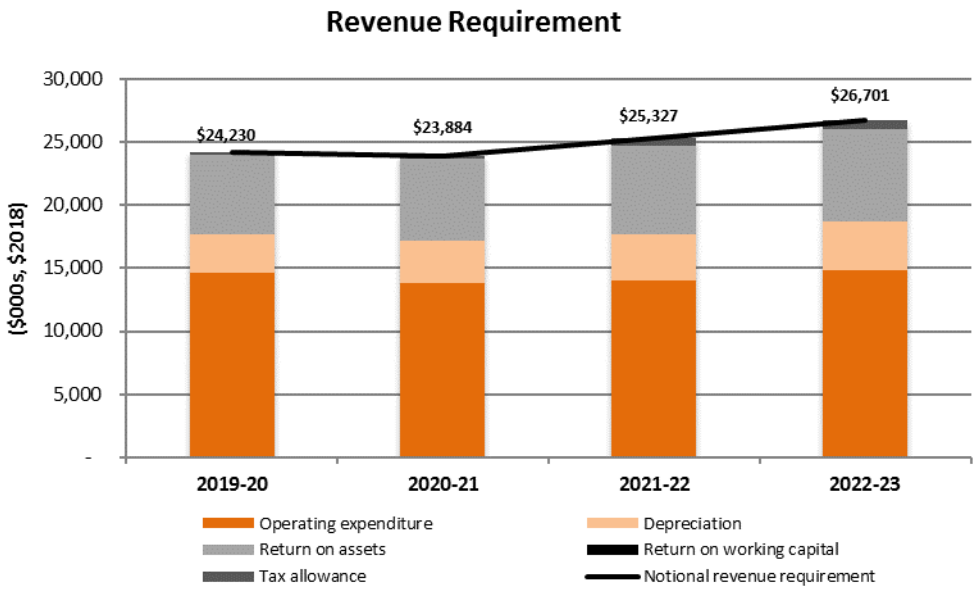
Table 11-1 summarises our proposed notional revenue requirement to recover Essential Water's total efficient costs over the 2019-23 determination period. It includes the following 'building blocks':

- an allowance to recover our operating expenditure,
- an allowance for a return on assets. This allows us to repay interest on our debt and provide a return to our shareholder,
- an allowance for a return of assets. This is the depreciation of our installed assets,
- an allowance for meeting tax obligations, and
- an allowance for working capital.

**Table 11-1: Notional revenue requirement ($000s real 2018-19)**

| $000 $2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | FY20-23 |
|---|---|---|---|---|---|
| Operating expenditure | 14,645 | 13,795 | 14,013 | 14,800 | 57,254 |
| Depreciation | 3,033 | 3,342 | 3,667 | 3,906 | 13,948 |
| Return on assets | 6,296 | 6,513 | 7,026 | 7,279 | 27,115 |
| Return on working capital | 22 | 2 | 16 | 48 | 87 |
| Tax allowance | 234 | 231 | 605 | 668 | 1,738 |
| **Notional revenue requirement** | **24,230** | **23,884** | **25,327** | **26,701** | **100,142** |

Source: IPART model as populated by Essential Water




Source: Essential Water internal analysis

# 3 TARGET REVENUE

Target revenue is the amount of money expected to be raised by Essential Water through the charges set by IPART. This may differ from the notional revenue. Where there are significant jumps or drops in the notional revenue requirement from one year to the next, we may propose an alternative path to minimise potential price or revenue shocks for customers and provide a smoother transition over the determination period.

Our target revenue includes revenue from:

- water and sewerage charges for all customers (including mines) to whom Essential Water delivers water and sewerage services,
- trade waste charges for those non-residential customers to whom Essential Water provides liquid trade waste services, and
- ancillary and miscellaneous charges on particular transactions.

Revenue from the mines, trade waste charges and ancillary and miscellaneous charges are subtracted from Essential Water's target revenue prior to setting all other water and sewerage charges. This is so that revenue received from other fees and charges is not double counted in our proposed water and sewerage prices.

Essential Water has adopted a net present value (NPV) neutral approach to setting prices, which means that our target revenue recovers the notional revenue requirement over the determination period in NPV terms.

Our proposed target revenue and a comparison to our proposed notional revenue requirement is shown in Table 11-2.

**Table 11-2: Proposed notional revenue requirement and target revenue ($000s real 2018-19)**

| $000s Real 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|
| Notional revenue requirement | 24,230 | 23,884 | 25,327 | 26,701 |
| Target revenue | 23,061 | 24,351 | 25,713 | 27,149 |
| Difference – target higher / (lower) ($) | (1,169) | 467 | 386 | 448 |
| Difference – target higher / (lower) (%) | -5% | 2% | 2% | 2% |

Source: IPART model as populated by Essential Water

## 3.1 Trade waste, miscellaneous and other charges

We derive the forecast revenue from trade waste, miscellaneous services and the mines from information supplied by Essential Energy, as well as our own calculations.

**Table 11-3: Proposed revenue from other fees and charges to be excluded from target revenue ($000s real 2018-19)**

| $000s Real 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|
| Revenue from trade waste charges | 2 | 2 | 2 | 3 |
| Revenue from miscellaneous charges | 119 | 126 | 134 | 142 |
| Total | 121 | 128 | 136 | 145 |

Source: Essential Water internal analysis

The following sections discuss our calculation and treatment of forecast trade waste and miscellaneous services revenue over the determination period.

### Trade waste charges

The revenue from trade waste charges to be deducted from the target revenue is shown in Table 11-3. Trade waste charges are set because trade waste customers impose costs on the sewerage system and they often have higher strength discharges. Our approach to trade waste charging is discussed in Chapter 12 'Tariff structures and price path' in Section 5.8.

We propose to increase our trade waste charges by the proposed X factor over the determination period in line with the IPART model calculation.

### Miscellaneous services

The revenue from miscellaneous charges to be deducted from the target revenue is shown in Table 11-3. Our approach to charging for miscellaneous charges is discussed in Chapter 12 'Tariff structures and price path' in Section 5.9.

We propose to increase our miscellaneous charges by the proposed X factor over the determination period in line with the IPART model calculation.

# 4 FINANCIAL VIABILITY

In setting prices, IPART aims to ensure that utilities are financially sustainable so that they can recover their efficient costs over the long term. Under IPART's building block model, IPART sets prices to recover the efficient costs of a benchmark business. This includes a market-based rate of return for equity and debt holders.

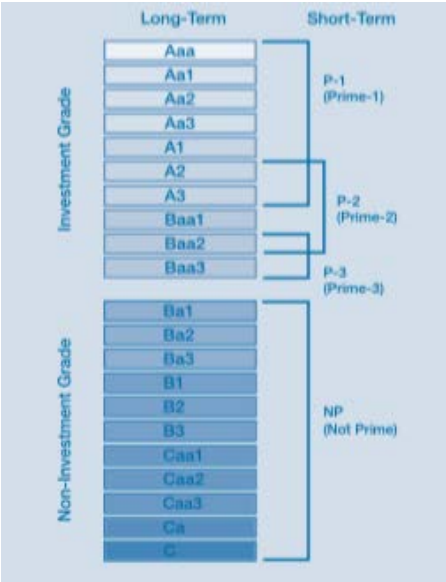
Robust financial health of utility businesses is generally considered to be in the best interests of customers. If a service provider is not financially viable, it may not be able to guarantee services to customers. Poor financial health may also lead to under-investment in assets and / or their maintenance, which could in turn lead to higher lifetime expenditure on assets (and consequently higher prices) and poorer quality services.

IPART's financeability test assesses the short-term financial sustainability of the utility – whether the utility will be able to raise the necessary debt financing, consistent with an investment grade-rated firm, during the regulatory period. IPART is currently reviewing its financeability test and we expect the outcomes of this review to be reflected in their financeability assessment of Essential Water in the draft determination.

In its 2013 decision on financeability, IPART stated that it will use the benchmark ratios of a 'Baa2' firm (using the methodology as published by Moody's rating agency) as a guide in assessing whether a utility is able to obtain finance, consistent with an investment grade firm.[46]

Based on the credit rating metrics calculated in IPART's water model (provided as an attachment to this submission), the revenues and prices proposed by Essential Water would result in an indicative credit rating in the Baa2 / Baa3 range. According to Moody's, a 'Baa' rating suggests moderate credit risk, with firms "considered medium-grade and as such may possess speculative characteristics"[47]. As outlined in Figure 1 below, a credit rating in this range is at the low end of what Moody's considers 'investment' grade.

**Figure 11-1: Moody's rating scale[48]**




Source: Moody's rating scale

Essential Water supports IPART's use of the financeability test and encourages IPART to ensure that its determination supports an indicative credit rating that is 'investment grade' of Baa2 or above.

[46] IPART Financeability tests in price regulation - Research — Final Decision, December 2013. Page 12.

[47] Moody's Rating Scale and definitions, https://www.moodys.com/sites/products/ProductAttachments/AP075378_1_1408_KI.pdf

[48] Ibid, page 1.

# Chapter 12 - Tariff structures and price path

# 1 SUMMARY

This chapter sets out Essential Water's proposed price path and tariff design. The proposal has been developed in accordance with the principle of pricing efficiency and shaped by community feedback through surveys and discussions with stakeholders.

Our approach to tariff structures seeks to improve economic efficiency without adversely impacting the combined water and sewerage bills of our smaller customers.

**Box 12-1: Key points**

Essential Water proposes to undertake the following for our tariff structures and proposed tariffs:

- retain the existing water tariff structure,
- increase our current water usage charge of $1.80 per kilolitre (kL) by the average increase each year,
- retain the existing sewerage tariff structure and increase sewerage charges by the average increase each year,
- maintain the approach to pricing for mining customers from the 2014 determination, and
- set water usage charges based on the principle of long run marginal cost (LRMC) as the starting point, then adjusted for environmental sustainability and customer preferences.

A typical residential customer consuming 200 kL of water per year would see an average annual increase in their combined water and sewerage bill of 9.1 per cent (6.4 per cent excluding inflation), or $127 per year.

A typical non-residential customer consuming 2,100 kL of water per year would see an average annual increase in their combined water and sewerage bill of 9.0 per cent (6.3 per cent excluding inflation), or $1,039 per year.

Forecast residential water tariffs and sewerage tariffs for each year of the 2019-23 regulatory period are set out in the following Table 12-1 and Table 12-2, respectively.

**Table 12-1: Forecast water tariffs**

| | Proposed | | | |
|---|---|---|---|---|
| **$ Nominal** | **2019-20** | **2020-21** | **2021-22** | **2022-23** |
| Service charge ($ per annum) | $358 | $393 | $430 | $472 |
| Usage charge ($ per kL) – treated water | $1.96 | $2.13 | $2.32 | $2.53 |

Notes: Nominal dollar terms, assuming 2.5 per cent forecast inflation and no pass-through adjustments.

**Table 12-2: Forecast sewerage tariffs**

| | Proposed | | | |
|---|---|---|---|---|
| **$ Nominal** | **2019-20** | **2020-21** | **2021-22** | **2022-23** |
| Service charge – residential ($ per annum) | $585 | $637 | $693 | $755 |
| Service charge – non-residential ($ per annum) X discharge factor^ | $836 | $910 | $991 | $1,078 |
| Usage charge ($ per kL) | $1.39 | $1.52 | $1.65 | $1.80 |

Notes: Nominal dollar terms, assuming 2.5 per cent forecast inflation and no pass-through adjustments.

^ Discharge factors individually assessed.

# 2 OUR CURRENT TARIFFS

## 2.1 What is tariff structure?

Tariff structure refers to the mix of charges Essential Water uses to recover the required revenue from water and sewerage customers. The tariff structure considers issues such as:

- how usage is charged to promote economic efficiency,
- the balance between fixed charges and usage charges, and
- whether tariffs should vary between different customer classes.

## 2.2 Our current tariff structure

Our current 2018-19 water tariffs for residential and commercial customers comprise:

- a fixed availability charge of $327.68 per annum, plus
- a flat water usage charge of $1.80 per kilolitre.

Our sewerage tariffs comprise:

- For residential customers:
- a fixed availability charge of $535.73 per annum.
- For non-residential customers:
- a fixed availability charge of $765 multiplied by a discharge factor calculated for each representative business type,[49] and
- a flat sewerage usage charge of $1.28 per kilolitre.

Essential Water's tariffs for 2018-19 have been locked in at 2017-18 levels (i.e. no change from last year's charges).

# 3 SETTING EFFICIENT PRICES

Considerable focus has been placed on tariff design by regulators, regulated businesses and customers in the utility sector in recent years as a mechanism to ensure that charges for the use of an infrastructure network provide efficient pricing signals.

## 3.1 What are efficient prices?

Efficient pricing is achieved when:

- usage charges are set equal to the marginal cost of providing the service, thereby promoting efficient usage, and
- residual charges, or those that are designed to recover the remaining cost of the service, are applied in a non-distortionary manner.

### Marginal costs

The concept of marginal cost is the foundation for pricing for utility services, with the starting point for efficient pricing being the setting of usage prices equal to marginal cost. When tariffs accurately reflect the marginal, or forward-looking, cost of increasing demand, consumers are able to make informed

[49] The residential sewerage availability charge for a 20 millimetre meter is $535.73, while the non residential sewerage availability charge is $765 x 70 per cent (assumed discount factor) = $535.50.

decisions about their water usage. Tariff reform seeks to promote investment in the network by businesses only when consumers value changes in demand more than the cost of delivering the changes in network capacity necessary to meet that demand.

Marginal cost can be estimated either in the short run or the long run. The fundamental distinction between short run and long run marginal cost is the period over which physical capacity can be altered to minimise cost. Specifically:

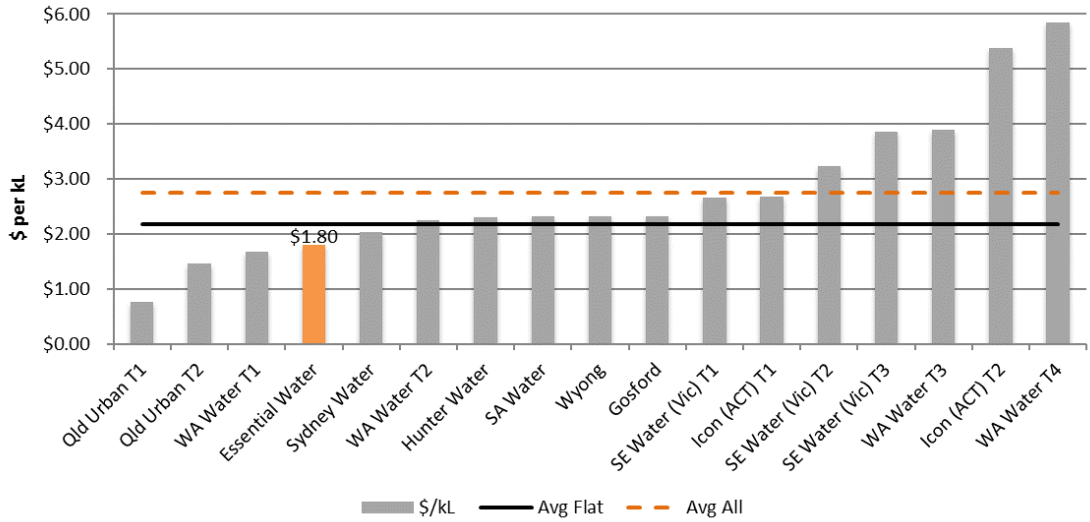
- short run marginal cost ('SRMC') is defined as the cost of an incremental change in demand, holding physical capacity constant, and
- long run marginal cost ('LRMC') relaxes the constraint of SRMC and is the cost of an incremental change in demand assuming physical capacity can be varied.

We have used LRMC as the basis for setting our Water usage charges. Further detail on this can be found in *Attachment 6: How our water charges are determined*.

## 3.2 Water usage charge benchmarking

The following figure outlines the current water usage charge for a sample of water utilities in NSW and Australia.

**Figure 12-2: 2017-18 water usage charges for Australian utilities**




Source: Internal analysis based on tariffs from company websites.

As illustrated above, the average water usage charge for businesses with a flat tariff is $2.18 per kilolitre, while the average of all usage charges (including all additional pricing tiers) is $2.75 per kilolitre. Essential Water's current water usage tariff of $1.80 is at the low end of the spectrum and, with the exception of Queensland Urban, is the lowest of any water network that does not offer an inclining block tariff (where the first block is often priced at a very low level).

### Environmental considerations

While not an economic principle, there are likely to be environmental benefits associated with higher, rather than lower, usage costs that would occur under current market conditions.

We note that in electricity, where the National Electricity Rules (NER) specify the use of LRMC as the basis for usage charges, the National Electricity Objective (NEO) is an economic objective that does not specifically include environmental considerations. Essential Water needs to consider a broader range of objectives, including environmental sustainability. This means that, irrespective of whether LRMC or SRMC is adopted as the starting point for usage charges, environmental sustainability factors indicate selecting a higher usage charge acts as a demand management initiative.

**Customer preference considerations**

When combined with customers' preferences for a reasonable proportion of usage charges so bills can be managed (see Chapter 4 'Customer and stakeholder engagement'), we suggest that the determined usage charges should be above the 'pure' usage charge as calculated through an LRMC or SRMC analysis. This reflects the views of our customers that having a proportion of usage charges generally consistent with the current 2/3 fixed:1/3 variable proportion of a residential bill allows usage decisions to be made that would lower bills. While not an economic consideration per se, customer preferences, such as the proportions of a bill that are based on fixed or variable charges, are an important consideration in the price setting process.

## 3.3 Our proposed water usage charge

We propose to increase our current water usage charge of $1.80 per kilolitre (2018-19) in each year of the upcoming regulatory period (2019-23) on the basis that:

- our current $1.80 per kilolitre is within the plausible LRMC range of $0.77 per kilolitre to $3.03 per kilolitre as outlined in Attachment 6 'How our water charges are determined'. This forms the starting point for setting the usage charge, which is proposed to be updated each year of the four-year regulatory period by the average change in price,
- based on our overarching objectives, a usage charge higher than the LRMC value selected as the starting point, i.e. at the upper end of the LRMC range or above, is an appropriate means to promote environmental sustainability,
- approximately 70 per cent of residential customers (66 per cent of business customers) surveyed would like the current fixed / variable proportion of their bills maintained. Approximately 23 per cent of residential customers (30 per cent of business customers) have told us that if the fixed to variable proportion of the bill were to change, that it should be weighted more towards variable (rather than fixed) charges. On this basis, we propose to increase the water (and sewerage) usage charges in line with our proposed X factors, and
- our water usage charges are at the low end of what other water Australian utilities charge their customers.

## 3.4 Residual costs

As discussed above, setting usage prices to reflect marginal costs promotes pricing efficiency. However, not all of Essential Water's costs are forward looking and responsive to changes in water usage demand. If network tariffs only reflected long run marginal cost, Essential Water would not recover all its costs. The costs that are not covered by marginal cost pricing are called 'residual costs'.

Residual costs refer to the total costs necessary to provide the service to customers, including allocated operating costs and a return on and of the regulated asset base, as allocated to the provision of the service to those customers, after the long run marginal costs are addressed through usage charges.

The principle of efficient pricing requires network tariffs to recover residual costs in a way that minimises distortions to the price signals for efficient usage that would result from tariffs reflecting only marginal costs.

The absence of substitutes for water supply means that a customer's decision to connect to Essential Water's network is highly price inelastic (i.e. the decision is largely not affected by changes in price).

Given that customers will tend to remain connected to the network, residual costs can generally be recovered via fixed charges. Because these charges are independent of a customer's usage decisions, they should have no effect on the price signals for efficient usage of the network service.

**Should there be a separate fixed availability charge for apartments?**

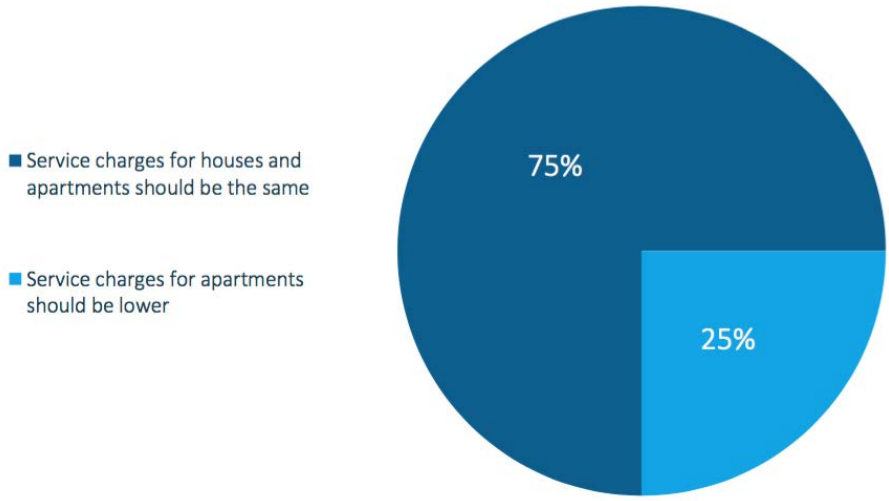
In its letter to Essential Water on 22 December 2017, IPART asked:

> *Is there merit in charging different residential service charges for apartments and houses (eg, based on meter size)? Does this represent a more cost-reflective price structure?*

*Should we continue deeming individual apartments to have a 20mm meter or should apartments revert to meter-based pricing based on their actual common meter size?*

As outlined in Chapter 4 'Customer and stakeholder engagement', Essential Water asked our customers if service availability charges for houses and apartments should be the same. The results from the survey are shown below:

**Figure 12-3 Service availability charges for houses and apartments**




Three in every four residents believe service charges for houses and apartments should be the same. This is consistent across age and gender. Given there is limited support (25 per cent) from customers for introducing a lower charge for apartments, we have not pursued this matter further.

We also consider that it is appropriate to continue to deem individual apartments to have a 20-millimetre meter. We think that the administrative complexities associated with reverting to meter-based pricing based on customers' actual common meter size would outweigh any marginal benefits that may accrue from the change.

# 4 SEWERAGE PRICING

We face different challenges with sewerage charges to those with water usage charges. While there is considerable infrastructure in place to support sewerage services globally, wastewater is universally not metered at customers' premises. The lack of metering has important considerations on the pricing framework and the role of pricing efficiency.

Installing sewerage metering for our residential and non-residential customers would be cost prohibitive and impractical, and is therefore not considered as part of this submission.

## 4.1 Usage charges for the sewerage network

In order to elicit any significant change in demand in response to a potential price signal, customers need to have the ability to make independent decisions on how much of a service they use. It is therefore important to determine whether:

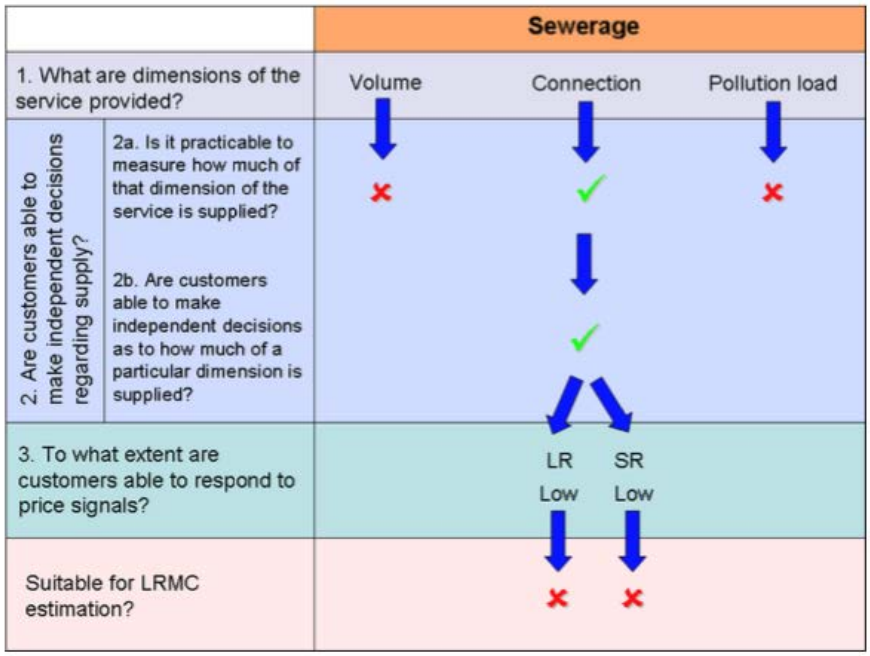
- it is practicable to measure how much of the service is consumed, and
- customers are able to make independent decisions as to how much of each service is consumed.

These two considerations represent the necessary choices that must be met for any service to have some price elasticity – that is, will there be an expected change in demand with a change in price.

If a service cannot be measured, or if customers are unable to alter their usage, then they are unlikely to respond to any price signals offered through marginal cost pricing. Sewerage pricing would appear to fit this category.

National Economic Consulting (NERA) provides a useful framework to assess whether a service is suitable for marginal cost pricing, as reproduced below.

**Figure 12-4 Sewerage service dimensions suitable for LRMC**




Source: NERA[50]

By contrast, water customers are able to measure the volume of water supplied through their meter. They are also able to make decisions as to how much water to consume, either explicitly (e.g. making the decision not to water the garden), or implicitly through investment in more water efficient appliances. While the volume of water supplied may be a suitable service for the purpose of marginal cost pricing, it is questionable whether sewerage pricing is suitable for marginal cost pricing.

The framework set out by National Economic Research Associates (NERA) in Figure 12-4 suggests that sewerage services may not be suitable for marginal cost pricing. Consistent with this framework, it is rare for a water utility to offer sewerage usage prices for residential customers. Essential Water does not charge sewerage usage to its residential customers and is not proposing to introduce sewerage usage charges for its residential customers.

Why then are sewerage usage charges common in some jurisdictions for sewerage pricing for non-residential customers in Australia?

The answer is not compelling and is likely addressed by a view that customers should have at least some incentive to reduce their sewerage usage in order to reduce the long term costs of the network. Leaving a tap running will result in increased water usage, but also increase wastewater – a sewerage usage charge would send some (albeit weak) signal to turn the tap off to reduce both water and sewerage volumes.

[50] See NERA Final Report - An Economic Framework for Estimating Long Run Marginal Costs in the Victorian Water Industry – 24 January 2012. Page 14.

Sewerage usage is likely to be highly inelastic (i.e. it's not largely influenced by price) and there is a tenuous link between sewerage usage charges and the benefits of using marginal costs as a basis of providing sewerage services.

On this basis, and the lack of visibility of sewerage volumes, it is arguable that sewerage usage charges should apply for non-residential customers at all.

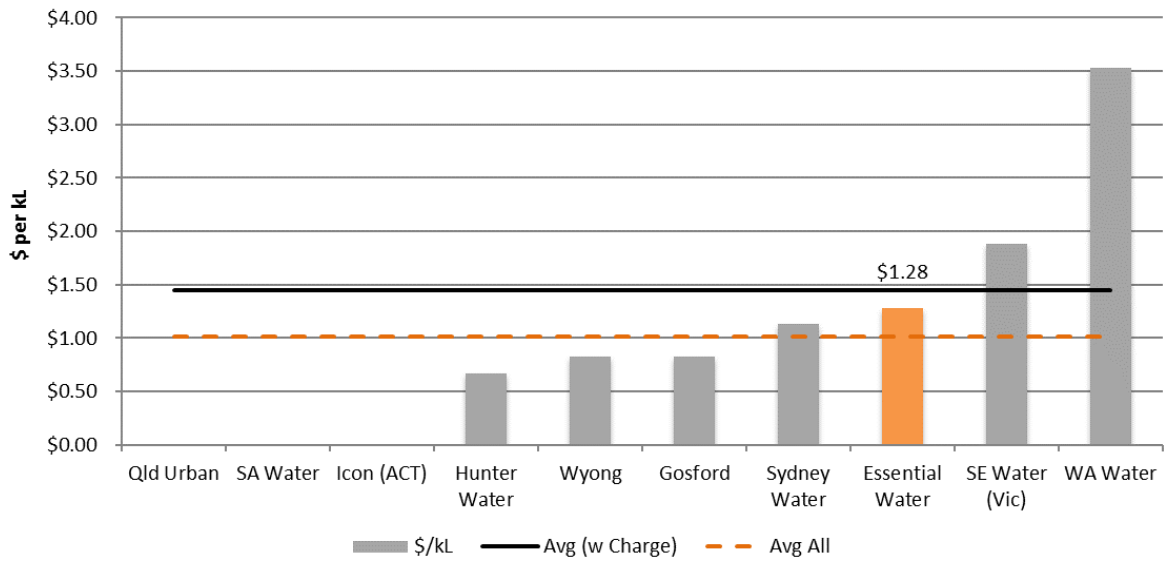
Like many water utilities, however, Essential Water does apply sewerage usage charges to non-residential customers in the Broken Hill region, as required by the 2014 IPART determination. The rationale for this is to provide an incentive to businesses to reduce their sewerage usage in order to reduce the long-term costs of the network. Our current sewerage charges for non-residential customers are based on the following parameters:

- a **fixed availability charge** of $765 multiplied by a discharge factor calculated for each representative business type:
  - e.g. a non-residential customer with a 20 millimetre connection would currently pay $765 times the relevant discharge factor,
  - the discharge factor is set for each business type and is based on the amount of water a business is expected to return to the sewerage network as a proportion of its water usage. This is discussed further in Section 4.5,
  - for a typical small business with a discharge factor of 70 per cent, its sewerage availability charge would be calculated as:
    - *$765 X 70 per cent = $535.73*, or roughly equal to the residential sewerage availability charge of $535.50, and
- a **flat sewerage usage charge** of $1.28 per kilolitre is applied to total amount of water supplied as measured by the water meter multiplied by the discharge factor.

## 4.2 Sewerage usage charge benchmarking

The following figure illustrates the current sewerage usage charge for a sample of water utilities in NSW and Australia.

**Figure 12-5: 2017-18 sewerage usage charges for Australian utilities**




Source: Internal analysis based on tariffs from company websites.

As illustrated above, the current sewerage usage charge for the Essential Water business is $1.28 per kilolitre, while the average of sewerage usage charges for water companies that charge a usage tariff is $1.45 per kilolitre. Essential Water's current sewerage usage tariff of $1.28 per kilolitre is around the median point, being slightly higher than other NSW water utilities regulated by IPART, but well below the charges levied by two of the interstate utilities. The interstate companies assessed from Queensland, South Australia and the ACT do not offer sewerage service charges.

## 4.3 Our proposed sewerage usage charge

Given that neither we nor the industry have undertaken sufficient research to justify a departure from applying sewerage usage charges (with the exception of the matters outlined in the following Section 4.4) and that the customer impacts of reforming the structure of sewerage tariffs have not been assessed, we do not propose a fundamental movement away from our current sewerage prices.

As a principle, Essential Water considers that LRMC is preferable to SRMC as the basis for infrastructure pricing, as outlined in section 3 above and in Attachment 6 'How our water charges are determined'.

However, the setting of sewerage pricing on the basis of LRMC or SRMC is largely academic and would require additional research and analysis on the role of marginal cost pricing for sewerage services that has not been undertaken by ourselves, industry or regulators to date.

Essential Water therefore considers that to provide certainty over pricing arrangements to our customers, we increase the current sewerage usage charge of **$1.28 per kilolitre** by the average change in prices in each year of the regulatory period commencing 1 July 2019.

## 4.4 Review of sewerage pricing for non-residential customers

In its 22 December 2017 letter and submission information package sent to Essential Energy's Chief Executive Officer, IPART indicated that it would review the structure of Essential Water's sewerage pricing as part of the upcoming review, stating:

Within sewerage services, non-residential customers with equivalent use to a residential customer pay more than their residential counterparts. This is because residential customers pay only a sewerage service charge and no explicit usage charge…

[This] indicates that residential customers either:

* *do not pay for the variable costs of transporting, treating and disposing of sewerage discharged into the system (ie, sewerage usage), or*

* pay a lower contribution to the fixed costs of the sewerage network (ie, if a usage component is assumed to be embedded in the current service charge).[51]

As discussed previously, sewerage bills are made up of two components: availability (also called 'service') charges, and usage charges. The issue raised by IPART relates to the fact that sewerage usage charges are only explicitly applied to non-residential customers, and without some further adjustment, the bills will be higher than those for residential customers for a service that is substantially the same.

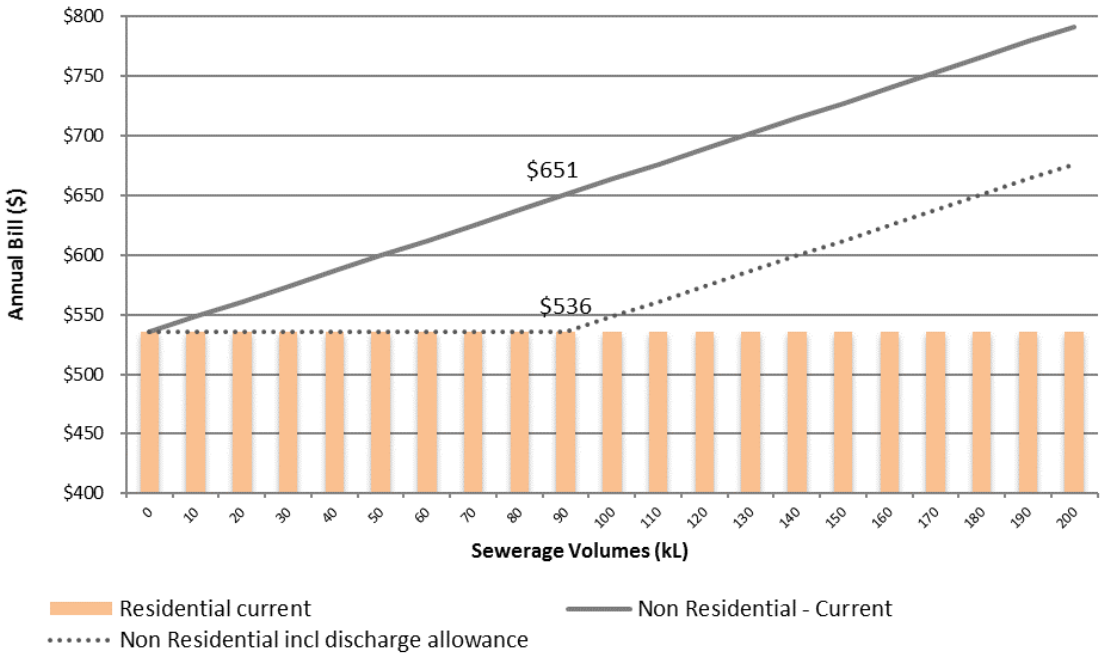
As illustrated in Figure 12-6, in all cases where there is water usage, the sewerage bill for a non-residential customer is higher than the sewerage bill for a residential customer.[52]

IPART has highlighted that there are potential equity and economic efficiency concerns with these sewerage pricing outcomes.

[51] IPART's Review of Essential Water Prices from 1 July 2019- Submission Information Package, Attachment B, Page 3.

[52] Assumes an average residential customer uses 130kL of water usage with a 70 per cent discount factor = 90kL of wastewater. Discount factors vary for non-residential customers by business type depending on their water usage characteristics. Analysis is based on prices assuming a 20mm meter.

**Figure 12-6: Sewerage bill comparison**




Source: Internal analysis.

As illustrated above, a residential customer discharging 90 kilolitres of wastewater annually, currently has a sewerage bill of $536, while a non-residential customer with the same usage has an annual sewerage bill of $651, or a bill that is $115 higher.[53]

The supply availability charge for residential and non-residential customers is virtually identical if a discount factor of 70 per cent is assumed for non-residential customers.[54] Therefore, the entire difference of $115 between the residential and non-residential bills of $536 and $651 as illustrated in Figure 12-6 (noting our use of a 70 per cent discharge factor) is due to the usage charge, which increases as volumes rise.[55] This is because the residential sewerage bill remains constant irrespective of wastewater usage (as there are no usage residential sewerage usage charges), whereas the non-residential bill increases with higher wastewater usage.

IPART has questioned whether maintaining higher bills for non-residential sewerage customers for a substantially similar service is appropriate.

There are a number of ways to address this bill difference, including adding a discharge allowance (as flagged by IPART and discussed below) and or adding a usage charge for residential customers

[53] The residential customer impact of introducing an explicit sewerage usage charge would mirror the 'Non Residential incl discharge allowance' dotted line in Figure 12-6. Essential Water is not proposing to introduce a sewerage usage charge for residential customers.

[54] The residential sewerage availability charge for a 20 millimetre meter is $535.73, while the non-residential sewerage availability charge is $765 x 70 per cent (assumed discount factor) = $535.50. Essential Water considers an implied 70 per cent discharge factor for residential customers for both usage and service is appropriate.

[55] The sewerage usage charge is calculated as water usage X discharge factor (70 per cent) X sewerage usage rate ($1.28/ kilolitre).

(which we do not propose). Alternatively, the appropriate outcome may be to preserve the current pricing arrangements.

**Deemed wastewater allowance**

As the starting point for assessing this matter, we assume that there is some level of wastewater usage in the average residential availability charge. In the current scenario, the residential availability charge of $536 would be comprised of 'deemed' wastewater usage of $115.

As non-residential customers pay the availability charge plus the sewerage usage charge, but do not receive the benefit of the $115 'deemed wastewater allowance' received by residential customers, their sewerage bills will be higher for essentially the same sewerage service.

The approach of applying a deemed wastewater allowance to non-residential customers is a mechanism to apply the same underlying assumption that wastewater usage is not charged for a specified base level of usage, called the 'deemed wastewater allowance'. Under this approach, all sewerage usage volumes above this allowance would continue to be charged at the sewerage usage rate for non-residential customers (residential customers would not pay directly for any water usage).

A deemed wastewater allowance is commonplace and is used by other water networks in NSW, including Sydney Water (150 kilolitres per year), Hunter Water (85 kilolitres per year), Gosford City Council (150 kilolitres per year) and Wyong Shire Council (150 kilolitres per year) and for WA Water (200 kilolitres per year).[56] Even though the residential sewerage bills are based entirely on fixed availability charges, the deemed wastewater allowance as calculated from residential sewerage usage is applied to non-residential customers' bills in order to achieve parity with residential customers' bills up to the deemed allowance for what is considered a substantially similar service.

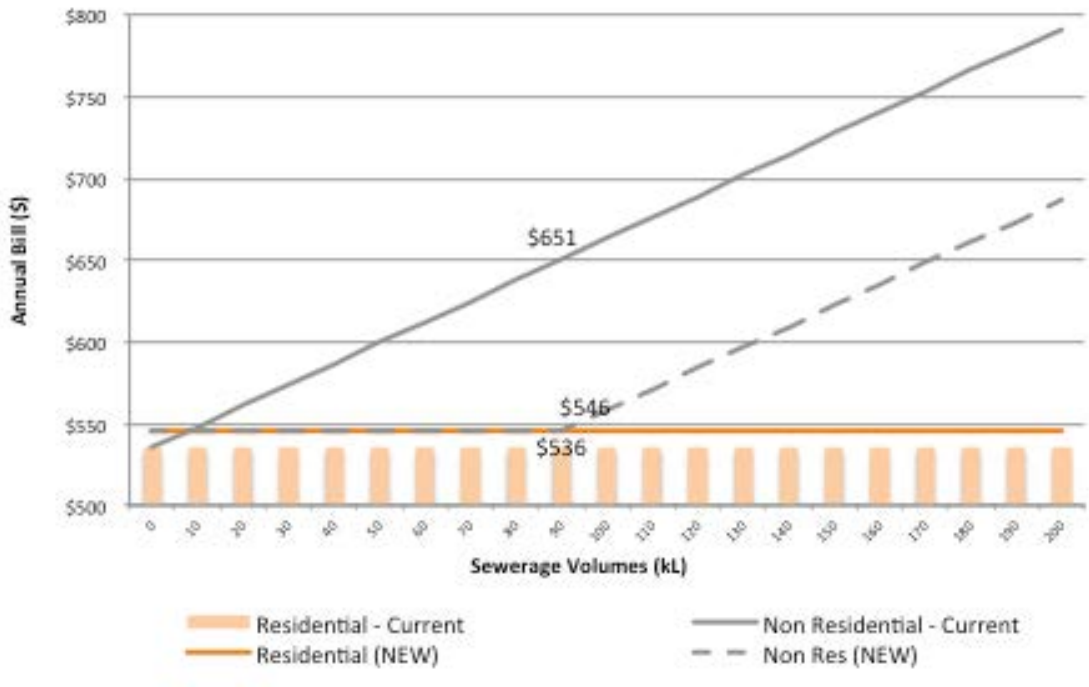
Unlike the other NSW water utilities regulated by IPART as noted above, Essential Water does not currently apply a deemed wastewater allowance and non-residential customers pay more for their sewerage service as a result.

A potential methodology to address this tariff imbalance may be to apply the deemed wastewater allowance to non-residential sewerage bills. However, this would necessarily require other charges to increase to address the revenue shortfall from the reduced non-residential charges.

Figure 12-7 illustrates how the proposed tariff reform would impact sewerage bills for customers.

[56] These are expressed in daily allowances in the following cases: Gosford City Council & Wyong Shire Council (0.41 kilolitres per day), Hunter Water (0.233 kilolitres per day) WA Water (0.547 kilolitres per day). These have been restated as annual allowances for comparison purposes.

**Figure 12-7 – Sewerage bill comparison with tariff reform**




Source: Internal analysis.

Figure 12-7 illustrates how the application of a deemed wastewater allowance and recalculating availability charges would effectively eliminate the bill differential for a non-residential customer with average sewerage usage up to the deemed wastewater allowance (assumed to be 90 kilolitres per year in the above example).

The non-residential sewerage bill would reduce by approximately $105 for a customer dispersing 90 kilolitres of wastewater, while the residential sewerage bill would increase by approximately $10 as the sewerage bills converge at approximately $546 per annum.

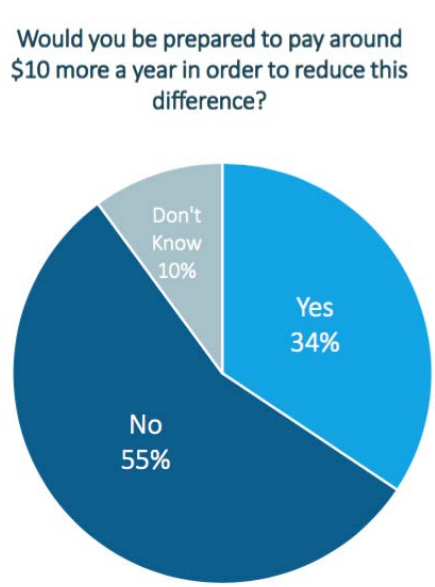
### Customer feedback

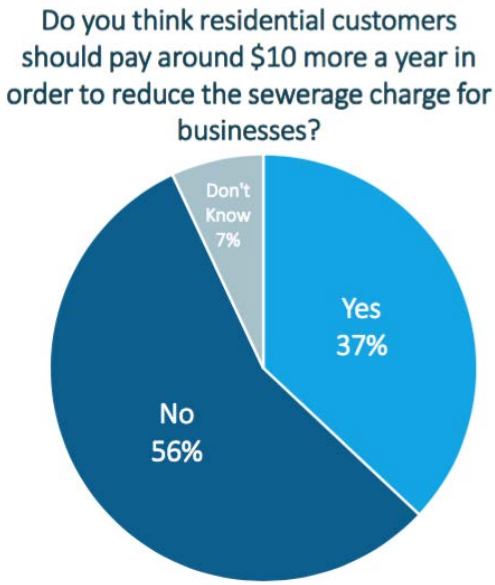
While we consider that introducing a deemed wastewater allowance may have some (albeit limited) merit from an economic perspective, we recognise that many residential customers in the community are experiencing hardship and may not be able to afford an increase of $10 to their bills. To help inform our position on whether to address this pricing imbalance, we engaged the community to seek their views. Chapter 4 ‘Customer and stakeholder engagement’ outlines our approach to engaging with customers during this review and discusses our quantitative survey undertaken in the region.

As noted in Chapter 4, customers surveyed were asked specifically if they felt that addressing this sewerage pricing imbalance was a priority and, if so, would residential customers be prepared to accept an increase in their sewerage bill of approximately $10 so that the costs of providing a similar service were more closely aligned.

The results are illustrated in Figure 12-8 and Figure 12-9.

**Figure 12-8: Residential customer sewerage survey Figure 12-9 Business customer sewerage survey**




While 60 per cent of residential customers indicated that all customers should pay the same for water and sewerage services, 55 per cent of residential customers would not be prepared to pay around $10 more in order to reduce the current sewerage pricing difference.

Perhaps more interesting is that, while 60 per cent of business owners also indicated that all customers should pay the same for water and sewerage services, only 37 per cent felt that residents should pay more to reduce sewerage charges for businesses.

As illustrated above, the majority of customers (residential customers and business owners) did not support increasing residential sewerage bills to bring the residential and non-residential sewerage bills closer together, even though 60 per cent of customers thought all customers should pay the same for water and sewerage services.

On the basis of what our customers have told us, we do not propose to restructure our sewerage charges to reduce the current pricing difference between residential and non-residential customers.

**Residential sewerage usage charges**

For completeness, eliminating the bill differential between non-residential and residential customers at all usage levels would require a usage charge for residential customers.

We are not proposing to introduce sewerage usage charges for residential customers.

As illustrated in Figure 12-5 and Figure 12-6, the gap in sewerage bills occurs at all volumes (not just at the assumed level of 90 kilolitres) could be eliminated through implementing usage charges for residential customers.

If metering for sewerage services was commonplace, introducing residential sewerage usage charges would potentially be a more equitable approach to pricing.

However, as discussed earlier, there is questionable economic rationale for pricing sewerage services on a marginal cost basis, and there would appear to be little, if any, economic benefit of introducing usage charges for residential customers. This is particularly the case when sewerage metering does not exist at residential (or non-residential) premises and is not likely to be introduced in the foreseeable future as the costs of the meters and the associated metering infrastructure would be prohibitive.

Without appropriate metering to signal sewerage volumes to customers (such as 'interval' or 'time-of-use' meters such as those used in electricity), we believe that introducing a residential sewerage usage charge would not increase the transparency of sewerage charging for the residential customer segment as customers would not have visibility of the sewerage volumes and therefore would not be expected to alter their usage in response to price signalling.

It should be noted that, while commercial sewerage usage charges are commonplace, it is rare to find a water network with residential sewerage usage charges. (We are not aware of any water network in Australia with residential sewerage usage charges.)

In summary, we are not proposing to introduce residential sewerage usage charges due to the negative impact on residential customers and the questionable economic benefits of doing so.

### 4.5 Sewerage discharge factors

A sewer discharge factor (SDF) is applied to both non-residential availability charges and non-residential sewer usage charges. The SDF is a number between 0.15 and 0.95, increasing in 0.05 increments, and dependent on the customer's business type.

The SDF is typically the ratio of the estimated volume discharged into the sewer system compared to the total water consumed by the customer – reflecting the impact of their water use on the sewerage system.

The *New South Wales Government Best Practice Water and Sewerage Guidelines* provide a list of recommended sewer discharge factors for different business types. In applying these guidelines, Essential Water has a designated employee who assesses each business to determine what category it belongs to and what SDF to apply. This is reviewed when the business changes ownership.

The customer's account will show the entire sewer availability and sewer usage charge. In the line under each of these separate charges there is a credit for the difference between the entire charge and the sewer discharge factor.

For example, a small retail shop with a SDF of 0.95 will be separately credited five per cent of the charges – this means the business only pays 95 per cent of each charge.

Individual SDFs are provided in a separate Attachment[57].

## 5 OUR PROPOSED TARIFFS

### 5.1 Comparison with other cities

As outlined in Chapter 1 'Context and background', Essential Water's bills are in the lowest third of a sample of 36 water utilities in NSW and Australia. In this benchmarking analysis, our customers' bills ranked the 11th lowest out of the companies sampled.

### 5.2 Water availability charge

The water availability charge is an annual charge, based on whether the customer's property has a metered water service or a pipeline service, or is vacant land. The level of the charge for metered and pipeline services also depends on whether the customer is categorised as 'residential' or 'non-residential'. The charge is determined by the size (diameter) of the water service from the main, as identified by the size of the meter. Charges are fixed for a financial year and charged on a per day basis.

[57] Sewerage discharge factors for non-residential customers are provided in our separately attached (and populated) IPART pricing model, in worksheet 'Pricing Assumptions', cells I663:I679.

The majority of residential customers have a standard 20 millimetre service and pay a uniform water availability charge. For non-residential customers, the water availability charge increases as the meter size increases. The schedule of water availability charges is the same across all of the water reticulation service areas. For vacant land adjacent to an available reticulation system main, the water availability charge is determined each year as a fixed amount.

A water availability charge is applied to all properties other than those identified as exempt under Schedule 4 of the *Water Management Act 2000*.

## 5.3 Water tariffs

Essential Water proposes the following charges for the 2019–23 regulatory period, set out in Table 12-3 for each water tariff component.

The precise method for calculating annual prices, including our proposed approach to cost pass through adjustments and demand volatility adjustments, is set out in Chapter 2: 'Form of regulation' and contained in confidential Attachment 8 'Metro Model - Revenue and Pricing Model'.

The proposed tariff components include an inflationary adjustment of 2.5 per cent per year and do not account for any cost pass through amounts or demand volatility adjustments.

**Table 12-3: Forecast water tariffs**

| | Proposed | | | |
|---|---|---|---|---|
| **$ Nominal** | **2019-20** | **2020-21** | **2021-22** | **2022-23** |
| Service charge ($ per annum) | $358 | $393 | $430 | $472 |
| Usage charge ($ per kL) – treated | $1.96 | $2.13 | $2.32 | $2.53 |
| Usage charge ($ per kL) – chlorinated | $1.26 | $1.37 | $1.50 | $1.63 |
| Usage charge ($ per kL) - untreated | $0.85 | $0.92 | $1.00 | $1.09 |

Notes: Nominal dollar terms, assuming 2.5 per cent forecast inflation and no pass-through adjustments.

## 5.4 Sewerage tariffs

Essential Water proposes to retain the current tariff structure. Our proposed price path for the 2019–23 regulatory period is set out in the Table 12-4 for each sewerage tariff component.

The proposed tariff components include an inflationary adjustment of 2.5 per cent per year and do not account for any cost pass through amounts or demand volatility adjustments.

Forecast sewerage service tariffs for each year of the 2019-23 regulatory period are set out below.

**Table 12-4: Forecast sewerage tariffs**

| | Proposed | | | |
|---|---|---|---|---|
| **$ Nominal** | **2019-20** | **2020-21** | **2021-22** | **2022-23** |
| Service charge – residential ($ per annum) | $585 | $637 | $693 | $755 |
| Service charge – non-residential ($ per annum) X discharge factor^ | $836 | $910 | $991 | $1,078 |
| Usage charge ($ per kL) – non-residential only | $1.39 | $1.52 | $1.65 | $1.80 |

Notes: Nominal dollar terms, assuming 2.5 per cent forecast inflation and no pass-through adjustments.

^ Discharge factors individually assessed.

## 5.5 Treatment of exempt customers

Under the *NSW Water Management Act 2000* (the Act), certain customers, such as some schools, hospitals, churches, and charitable organisations are exempt from paying access charges. This means we cannot charge these customers an access charge. As IPART includes exempt customer numbers when calculating our availability charges, and we are not able to charge exempt customers the availability charge, we are currently unable to recover our efficient costs while complying with the Act through our existing pricing arrangements.

The amounts are not trivial. We estimate that the foregone revenue as a result of IPART's approach to price setting for exempt customers is in the order of $0.4 million annually.

Up until 1 July 2014, we shared the revenue we would otherwise receive from exempt customers between all other customers to ensure we fully recovered the efficient costs of our operations. IPART did not support this approach in its last determination, stating that customers should not be cross-subsidising exempt properties through higher prices and that the funding for exempt properties is a matter for Essential Energy and the NSW Government.

While we have put forward pricing for 2019-23 that is consistent with IPART's 2014 decision, we do not support IPART's approach given the Act specifically exempts these customers from paying access charges. The community benefits from these organisations and a small increase in overall charges for other customers would ensure we are able to recover the efficient costs of our operations and continue to provide reliable water and sewer services to the community.

We do not think that the Act contemplates Essential Water bearing the costs of complying with the requirements for exempt customers. Nor do we consider that separate NSW Government funding for these costs is appropriate, when a pricing mechanism is available to ensure we are able to recover our efficient costs while complying with our legal obligations.

We seek the opportunity to work with IPART to resolve this matter through the existing pricing arrangements or through the introduction of cost-reflective tariffs for exempt customers.

## 5.6 Indicative bill impacts for residential customers

Broken Hill and its surrounding areas face problems similar to other country towns in NSW, where the cost of maintaining service levels has to be borne by a declining population.

The impact of pricing on residential customers will vary, depending on factors such as their water usage, water service, and meter size. To illustrate the likely impact, Table 12-5 compares the current annual water and sewerage bill for an average customer with the annual bill they would receive under the proposed pricing.

It shows that the annual bill for customers who use 200 kilolitres per year would increase by a total of $508 over the four-year determination period. This represents an average increase of 9.1 per cent per year (in nominal terms).

Forecast impacts on water and sewerage bills for average residential customers are set out below.

**Table 12-5: Impact of proposed prices on the annual water and sewerage bill for average residential customers supplied with treated water ($nominal)**

| | Current | Proposed | | | | |
|---|---|---|---|---|---|---|
| $ Nominal | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Total increase |
| Residential non-pensioner | | | | | | |
| 200kL | $1,223 | $1,335 | $1,456 | $1,588 | $1,732 | |
| Year on year increase | | $112 | $121 | $132 | $144 | $508 |
| Change in bill (per cent) | | 9.2 % | 9.1 % | 9.1 % | 9.1 % | |
| Residential pensioner* | | | | | | |
| 200kL | $1,048 | $1,160 | $1,281 | $1,413 | $1,557 | |
| Year on year increase | | $112 | $121 | $132 | $144 | $508 |
| Change in bill (per cent) | | 10.7% | 10.4% | 10.3% | 10.2% | |

*The residential annual bill amounts for pensioners are the same as for residential non-pensioners *less* the $175 rebate from the government. As a result, the price increases in dollar terms match those of a residential non-pensioner.

Table 12-6 shows the impact of the proposed pricing arrangements on the annual water bills of residential customers who are supplied with chlorinated water and pipeline customers supplied with untreated water. It shows that the annual water bill for a residential customer who uses 200 kilolitres of chlorinated water a year will increase by a total of $238 over the proposed four-year period, or by an average of 9.3 per cent per year.

The annual bill for a pipeline customer who uses the same volume of untreated water will increase by a total of $207 or an average or 9.3 per cent per year.

**Table 12-6: Impact of proposed prices on annual water bills for average residential non-pensioner customers supplied with chlorinated water and for pipeline customers supplied with untreated water ($nominal)**

| | Current | Proposed | | | | |
|---|---|---|---|---|---|---|
| $ Nominal | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Total increase |
| Residential chlorinated water | | | | | | |
| 200kL | $560 | $611 | $667 | $730 | $797 | |
| Year on year increase | | $51 | $57 | $62 | $68 | $238 |
| Pipeline, untreated water | | | | | | |
| 200kL | $484 | $528 | $577 | $631 | $691 | |
| Year on year increase | | $44 | $49 | $54 | $59 | $207 |

## 5.7 Indicative bill impacts for non-residential customers

The impact of the proposed prices on non-residential customers will also vary depending on factors such as the individual customer's water usage, water service, sewerage discharge factor (if receiving sewerage services) and meter size.

Table 12-7 below shows the annual water and sewerage bill for an average non-residential customer using 2,100 kL of treated water per year. It shows that the total bill will increase by $4,157 over the four-year determination period, or an average of $1,039 or 9.0 per cent per year (in nominal terms).

**Table 12-7: Forecast non-residential bill impact**

| Nominal $ | Proposed | | | | |
|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 | 2023 |
| Non-residential customer using 2100kL per year | | | | | |
| Combined water and sewerage bill ($ per annum) | $10,149 | $11,065 | $12,054 | $13,132 | $14,306 |
| Change in bill ($) | | $916 | $989 | $1,078 | $1,174 |
| Change in bill (%) | | 9.0% | 8.9% | 8.9% | 8.9% |

Notes: Nominal dollar terms, assuming 2.5 per cent forecast inflation and no pass-through adjustments.

^ Assumes Discharge Factors of 70 per cent.

Table 12-8 below shows the annual water and sewerage bill for an average pipeline customer using 1,000 kL of treated water per year. It shows that the total bill will increase by $540 over the four-year determination period, or an average of $135 or 9.1 per cent per year (in nominal terms).

**Table 12-8: Pipeline customer bill impacts**

| | Current | Proposed | | | | |
|---|---|---|---|---|---|---|
| $ Nominal | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Total increase |
| 1,000kL - 25mm meter | 1,291 | 1,407 | 1,536 | 1,677 | 1,831 | |
| Year on year increase | | $116 | $129 | $141 | $154 | $540 |
| Change in bill (%) | | 9.0% | 9.2% | 9.2% | 9.2% | |

## 5.8 Trade waste charges

Essential Water has a range of charges relating to the provision of trade waste services as described in Chapter 3 ‘Service standards’.

The cost to water utilities of handling trade waste is usually higher than the cost of handling domestic sewage. Trade wastes typically involve much higher strength discharges than domestic sewage and consequently can impact on downstream infrastructure. The presence of higher strength substances can adversely affect the biological processes within a sewerage treatment plant and present a significant safety risk for sewerage system operations and maintenance personnel.

The costs associated with trade waste services include:

- the cost of transporting and treating the trade waste and maintaining the infrastructure involved,
- the costs associated with monitoring trade waste discharges, such as site inspections, and
- administration costs associated with issuing and ensuring compliance with licence agreements (which specify the allowable contents and volume of the trade waste the customer is permitted to discharge).

In setting trade waste prices, Essential Water has aimed to ensure that these prices reflect the efficient costs of providing trade waste services. This required the consideration of several options for setting prices. The options included increasing current trade waste charges:

- by the annual change in CPI over the determination period. This is the simplest method,

- by the average annual increase in all water and sewerage charges under this determination. This option has the disadvantage that it is difficult to ascertain whether trade waste costs will increase at the same rate as overall costs,
- by the annual increase in sewerage prices under this determination. This option takes account of the fact that trade waste is disposed of via the sewerage system and therefore contributes to many of the same costs, and
- by the annual increase in the operating expenditure cost block of the revenue requirement. This option takes account of the fact that trade waste costs generally reflect operating rather than capital costs.

Essential Water proposes to increase the current level of trade waste charges by the change in the annual revenue over the determination period in line with IPART's model. This simple approach assumes that the costs of providing trade waste services will change in line with other water and sewer services.

## 5.9 Miscellaneous charges

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 and are charged on an as incurred basis.

Essential Water proposes to increase the current level of each charge by the change in the annual revenue over the determination period in line with IPART's model. This simple approach assumes that the costs of providing miscellaneous services will change in line with other water and sewer services.

## 5.10 Mines pricing

At the 2014 determination, and given the lapse of the NSW Mines agreement, individual cost-reflective prices for water usage were approved by IPART for pricing for the mines. This method takes into account the assets utilised by the mines and other customers, historical funding and the maintenance costs associated with these assets. In addition, depreciation expense and return of capital is taken into account. This means that all customers will be paying prices that are cost reflective, with no subsidy between small customers and the mines.

Mines prices for the 2014 determination were developed in conjunction with the NSW Department of Public Works and consultation was held with the mines.

As the proportion of water used by the mines in relation to total water used in Broken Hill has not changed significantly, we propose to maintain the approach to mines pricing from the 2014 determination and to increase mines' charges by the average increase (X factor) each year. We maintain this is the most appropriate method of providing cost reflective prices for the mines and that it is not appropriate to place the mines on meter-based charges like smaller customers.

In the event a new mine should commence operations, we will provide a price that is calculated along the same lines as the current mine prices.

The charges Perilya Limited pays for sewerage services to the houses and other buildings located within the Perilya lease area form (a confidential) part of this submission. The same sewerage usage tariffs have been adopted for Perilya as have been applied to other residential and non-residential properties serviced by Essential Water.

# 6 HOW WE'VE RESPONDED TO COMMUNITY FEEDBACK

Our tariff proposal has been shaped to a large degree by community feedback. As outlined in Chapter 4 'Customer and Stakeholder Engagement', we have obtained qualitative and quantitative data on several key areas that directly impacted our tariff structure proposals. In particular:

| Topic | What we asked and what we heard from customers |
|---|---|
| Fixed Charge vs variable percentage  | We asked our customers for their preferences for the appropriate percentage of a bill that is comprised of charges that are fixed (thereby providing certainty) versus variable (where customers can take action to lower their bills). As around 70 per cent of customers were satisfied with the current fixed and variable proportions of the bill (with 23 per cent to 30 per cent of customers wanting higher usage charges if any change was to occur), this has been reflected in the level of our proposed water and sewerage usage charges. |
| Sewerage charges  | We canvassed views on whether the current difference in sewerage bills for a non-residential customer compared with a residential customer that receives a similar service (arising from non-residential customers paying sewerage usage charges where residential customers don't) should be addressed. We asked whether there was support for increasing residential customers' bills by approximately $10 to bring down non-residential bills by $105 in order to better align the bill outcomes. This was reflected in our decision to maintain the current pricing structure as there was not strong support from residential customers or business owners to increase residential sewerage charges. |
| Changes to current bills  | We sought views on whether any changes to current bills should be sourced from all customers or whether charges for residential customers should be increased at a lower rate that non-residential customers due to capacity to pay concerns.<br>This was considered in our proposal and is reflected in our approach to apply any future price changes in substantially the same proportions to residential and non-residential customers. This reflects feedback that affordability pressures are similarly experienced by our commercial customers in the region. |
| Fixed availability charges  | We asked customers for their views on whether the same fixed availability charge should apply to houses as apartments. The limited support to introduce separate fixed availability charges for apartments was considered in our view to keep availability charges the same for houses and apartments due to administrative concerns of implementing the change and the impact of unwinding the current price structures in light of increasing average prices. |
| Affordability  | We sought the community's views on affordability. While this did not alter our proposed pricing structures, it has been reflected in terms of our focus on efficiency and keeping costs down to keep downward pressure on prices. |

# 7 RECYCLED WATER PRICING

Essential Water currently supplies treated effluent from its two waste water treatment plants to a number of external customers in Broken Hill.

Treated effluent is water that has been collected from Essential Water's sewer reticulation network, and has undergone primary, secondary and tertiary treatment at one of the wastewater treatment plants before being supplied to a range of external customers. The supply of treated effluent aligns with Essential Water's Environmental Protection Licences for the operation of the wastewater treatment plants as administered by the NSW Environment Protection Authority.

Essential Water supplies treated effluent to the following customers:

- Cristal Mining – for use in mineral processing operations and irrigation of trees & shrubs.
- Broken Hill City Council – for use in dust suppression and vermiculture operations at local landfill site.
- Broken Hill Racecourse – for use in irrigation of turf.
- Broken Hill Golf & Country Club – for use in irrigation of greens.
- Perilya Broken Hill Mining Operations – for use in irrigation of parks and ovals.
- Private customer – for use in irrigation of turf.
- Private customer – for use in creation of an artificial wetland.
- Private Customer – for use in irrigation of plant nursery.

## 7.1 Approach for pricing of recycled water schemes

In the 2014 determination, IPART decided that Essential Water should treat effluent water as an unregulated income source and share this income equally between Essential Water and its customers. IPART considered this was reasonable, as effluent water is not a monopoly service.

IPART's general approach to unregulated income is to share it equally between the business and its customers on the basis that the regulated business is earning income from assets included in the RAB, which are funded through the prices set by IPART. Therefore, IPART determined that customers should benefit from the income generated from the regulated assets and allowing Essential Water to retain 50 per cent of the revenue provides an incentive for it to optimise earnings from its regulated assets.

While Essential Water notes that customers are not liable for ongoing operation, performance and compliance and pay for water and sewerage services provided by Essential Water, and arguably should not be entitled to revenue sharing arrangements, we nevertheless propose to continue IPART's current regulatory practice of treating effluent water as an unregulated income source with revenue shared 50:50 between Essential Water and customers.

# Abbreviations and acronyms

| | |
|---|---|
| ABS | Australian Bureau of Statistics |
| ACT | Australian Capital Territory |
| AEMC | Australian Energy Market Commission |
| AER | Australian Energy Regulator |
| AIC | Average incremental cost approach to calculate LRMC |
| AIR | Annual Information Return |
| ATO | Australian Taxation Office |
| BOM | Australian Bureau of Meteorology |
| CAPM | Capital asset pricing model |
| CPI | Consumer price index |
| CSO | Community service obligation |
| DN | Nominal diameter of pipe |
| DSC | NSW Dam Safety Committee |
| DVAA | Demand volatility adjustment amount |
| EBSS | Efficiency Benefit Sharing Scheme |
| EC | Electrical Conductivity is a measure of salinity. Electricity is conducted with increased ease as the concentration of dissolved salt in the water increases. Therefore, a high electrical conductivity indicates a high concentration of salt. It is measured in microSiemens per centimetre (µS/cm) |
| ECM | Efficiency carryover mechanism |
| ESC | Essential Services Commission |
| ESCV | Essential Services Commission, Victoria |
| ESCOSA | Essential Services Commission of South Australia |
| ICRC | Independent Competition and Regulatory Commission (ACT) |
| GAMMA | Value of imputation credits |
| GL | Gigalitre – Equivalent to one thousand megalitres or one billion litres |
| HDPE | High density polyethylene |
| HU | Hazen Unit - a measure of true colour. An important aesthetic characteristic for customer acceptance. Treatment processes can be optimised to remove colour. The aesthetic guideline for true colour is <15 HU. |
| IPART | Independent Pricing and Regulatory Tribunal |
| IWCM | Integrated water cycle management plan |
| kL | Kilolitre – equivalent to one thousand litres |
| µS | microSiemens |
| LRMC | Long run marginal cost |
| MRP | Market risk premium |
| MSCL | Mild steel cement lined pipeline |
| mL | Millilitre – one thousandth of a litre |

| | |
|---|---|
| ML | Megalitre – equivalent to one million litres |
| mg | Milligram |
| NTU | Nephelometric Turbidity Unit a measure of turbidity. 5 NTU is just noticeable in a glass. <0.2 NTU is the target for effective filtration of Cryptosporidium and Giardia. <1 NTU is the target for effective disinfection. The aesthetic guideline for turbidity is <5 NTU. |
| pH | A measure of the acidity or basicity of an aqueous solution. Solutions with a pH less than 7 are said to be acidic and solutions with a pH greater than 7 are basic or alkaline. Pure water has a pH very close to 7. |
| PVC | A measure of the acidity or basicity of an aqueous solution. Solutions with a pH less than 7 are said to be acidic and solutions with a pH greater than 7 are basic or alkaline. Pure water has a pH very close to 7. |
| RAB | Regulatory asset base |
| RBA | Reserve Bank of Australia |
| S | Siemens - the unit of electric conductance and electric admittance. |
| SBP | Strategic business plan |
| SEIFA | Socio-Economic Indexes for Areas |
| SIR | Special Information Return |
| SRMC | Short run marginal cost |
| TAB | Tax asset base |
| THETA | Value of imputation credits distributed to investors as a proportion of their face value |
| WACC | Weighted average cost of capital |
| WAMP | Water asset management plan |
| WTP | Water treatment plant |
| WWTP | Wastewater treatment plant |
| Turvey method | The perturbation method used to calculate LRMC |

# Appendix 1 – Wentworth to Broken Hill pipeline

Figure 2-6: Summary of the Preferred Option


Source: NSW Public Works Department

**New infrastructure key details**

- Single 270km long pipeline
- Pipeline daily raw water transfer capacity of 37.4ML
- Sources water from Wentworth on the River Murray, NSW
- The bulk water source at Wentworth, has an average salinity level of 261EC[5]
- Predominantly below ground construction
- Design includes three pumping stations
- The majority of the route follows the Silver City Highway, utilising existing road easement and the route used by the National Broadband Network (NBN)
- Utilises existing power supply infrastructure

**Existing water system key changes**

- Broken Hill's water supply is decoupled from the Menindee Lakes system; however Menindee and Sunset Strip will retain Menindee Lakes supply as its primary source. Menindee and Sunset Strip will also retain use of the Menindee Common bore field as a supplementary source
- Ability to supply Sunset Strip and Menindee by gravity fed raw water from Stephens Creek, via existing pipeline, if required
- Uses Stephens Creek Reservoir as a raw water balancing storage facility
- Minor upgrades to the existing Menindee to Stephens Creek pipeline
- Mica Street WTP continues its current operations

# Appendix 2 – Brief history of Broken Hill water

The following brief history of the water supply arrangements in Broken Hill should be read in conjunction with section 3.1 above.

**Darling River**

The Darling River off-take at the Menindee Lakes Scheme has to date been the main source of water for Essential Water. The river is partly regulated through release of water from Lake Wetherell, part of the Menindee Lakes Scheme. Essential Water uses an intake structure in the river at Menindee and a pump station to pump water to Broken Hill. The licensed entitlement is 9.975 gigalitres (GL) per year of high security water. Essential Water also has a licence for 29 ML per year for raw water for Menindee. The water has to be pumped to a height of 287 metres over a distance of 116 kilometres from its source at the Darling River to the Stephens Creek reservoir.

During drought (when the total storage in the scheme falls below 480 GL and until it returns to 640 GL), the management of the Menindee Lakes Scheme, in terms of making available Essential Water's licence entitlement, rests with the NSW Department of Water and Energy through WaterNSW. At all other times, the management of the lakes scheme rests with the Murray Darling Basin Commission.

**Stephens Creek**

Stephens Creek Reservoir is a 19,000 ML reservoir with a large surface area and a shallow depth, resulting in historically high evaporative losses and low reservoir efficiency. A levy was placed in the reservoir in 2003, which has significantly reduced the evaporative losses when inflow occurs. Stephens Creek reservoir receives water from its own catchment as well as water pumped from the Darling River. The quality of water in this reservoir tends to be controlled by the quality of the water transferred to it from the Darling River.

**Umberumberka**

Umberumberka is a 7,800 ML reservoir located 28 kilometres northwest of Broken Hill on Umberumberka Creek. Water is pumped to Blue Anchor tank using diesel pumps, and then gravity fed to Broken Hill, supplying Silverton as it passes by. The quality of water from this source is generally very good and tends to be the best of all the available sources. Umberumberka Dam is a deep, efficient storage, but its catchment is unreliable as a sustainable water source – filling only once every 15 years.

**Imperial Lake**

Imperial Lake is a small, 670 ML reservoir that collects water from its own small catchment, which includes part of the Broken Hill urban area. Water can be transferred to Imperial Lake from Stephens Creek and Umberumberka via the Mica Street water treatment plant. The lake is used as emergency storage only. The quality of water from this source is highly variable, not only because of its urban catchment, but also due to the fact that, as it is only used in emergency situations, the salt, organic and metals concentrations of the stored water can be high.

Essential Water is planning to decommission the Imperial Lake reservoir during the upcoming determination period as it is uneconomic to undertake the required dam safety rectifications to ensure its ongoing safe operation.

# Appendix 3 – Demand volatility adjustment mechanism formulas

We propose that the following test is applied to assess whether the materiality test for the demand volatility adjustment mechanism has been triggered. The proposed trigger mechanism test is applied to the difference between actual and IPART-allowed revenues – rather than actual and IPART-allowed volumes – in recognition that some volume variations have a more material impact on the business or its customers than other volume variations.

For example, sewerage usage charges do not apply to residential customers. Setting a demand volatility adjustment mechanism based on residential sewerage volumes may erroneously lead to the mechanism being triggered.

Our proposed approach first calculates a 'deadband', which represents the range of revenues for 'business as usual' activities and for which there are no adjustment payments required. We then assess whether actual revenues are outside of the deadband and, if such revenues exist, we calculate the adjustment amount required to notional revenue requirements for the following determination.

**Step 1: Calculate demand volatility adjustment mechanism deadband**

The first step in assessing whether the demand volatility adjustment mechanism has been triggered is the calculation of the deadband. The upper and lower limits of the proposed deadband are calculated in the formulas below:

*Formula 1: Deadband upper limit*

Deadband upper limit = Allowed revenue $Yr_1$ to $Yr_4$ x (1+ Materiality Threshold)

*Formula 2: Deadband lower limit*

Deadband lower limit = Allowed revenue $Yr_1$ to $Yr_4$ x (1 – Materiality Threshold)

As an example, if the total allowed revenues from the IPART determination equal **$1,000** ($2018-19) and the materiality threshold is **± 5 per cent**, the deadband would be calculated as follows:

Upper limit = $1,000 x (1+0.05)
=$1,000 x 1.05
=$1,050

Lower limit = $1,000 x (1-0.05)
=$1,000 x 0.95
=$950

The deadband in this example is the revenue range from **$950 to $1,050** inclusive.

The following step then assesses whether actual revenues are inside, or outside, of the deadband (i.e. we calculate whether the materiality threshold has been triggered). If actual revenues are outside of the deadband, adjustment payments would then be calculated. If actual revenues are within the deadband, the mechanism has not been triggered and no further action is required.

**Step 2: Assess whether actual revenues are outside of the deadband**

This step compares the allowed revenues to the deadband to assess whether the materiality threshold has been triggered.

The following examples are based on the above scenario of a deadband that ranges from $950 to $1050 based on IPART-allowed revenues of $1,000 over the four-year period and a materiality threshold of plus / minus 5 per cent. The examples identify whether actual revenues are outside of the deadband and, if so, the amount of the adjustment required at the following determination.

*Example 1*

Actual revenues over the four-year regulatory period total $920.

In this example, as actual revenues are less than allowed revenues, actual revenues are compared to the lower limit of the deadband as follows:

| | |
|---|---|
| Actual revenues | $920 |
| Deadband lower limit | $950 |
| Are actual revenues outside of deadband? | Yes |
| Adjustment amount | $30 |

As actual revenues of $920 in this example are below the lower limit of the deadband, the demand volatility adjustment mechanism **has been triggered**. The adjustment amount at the subsequent determination would be a **$30 increase** to the notional revenue requirement.

*Example 2*

Actual revenues over the four-year regulatory period total $1,040.

In this example, as actual revenues are greater than allowed revenues, actual revenues are compared to the upper limit of the deadband as follows:

| | |
|---|---|
| Actual revenues | $1,040 |
| Deadband upper limit | $1,050 |
| Are actual revenues outside of deadband? | No |
| Adjustment amount | N/A |

As actual revenues of $1,040 in this example are within the deadband, the demand volatility adjustment mechanism **has not been triggered**. Therefore, there is no adjustment amount required to the notional revenue requirement at the subsequent determination.

*Example 3*

Actual revenues over the four-year regulatory period total $1,090.

In this example, as actual revenues are greater than allowed revenues, actual revenues are compared to the upper limit of the deadband as follows:

| | |
|---|---|
| Actual revenues | $1,090 |
| Deadband upper limit | $1,050 |
| Are actual revenues outside of deadband? | Yes |
| Adjustment amount | $40 |

As actual revenues of $1,090 in this example are above the upper limit of the deadband, the demand volatility adjustment mechanism **has been triggered**. The adjustment amount at the subsequent determination would be a **$40 decrease** to the notional revenue requirement.

Essential Water notes the implementation of the demand volatility adjustment mechanism as outlined above requires four-years of revenue information available to the business and IPART. This would not normally exist due to the timing of the submission process, where only three years of revenue information would be available prior to IPART's final determination (assuming a four-year determination period), and only a forecast of the third and fourth years would be available to the business for inclusion in its regulatory proposal.

This can, however, be addressed through including a forecast for the third and/or fourth years in the regulatory proposal and a subsequent 'true-up' implemented at the following determination.

Essential Water looks forward to discussing our proposed approach to the demand volatility adjustment mechanism with IPART in the lead-up to the draft determination.

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# Appendix 4 – Cost pass through events

Essential Water proposes that IPART adopts a cost pass through framework that draws from elements in the National Electricity Market (NEM), incorporating:

- a regulatory change event,
- a drought relief event,
- a Wentworth to Broken Hill pipeline event, and
- a consequential works event.

Definitions for the above events are provided below and are adapted from the definitions in the National Electricity Rules (Chapter 10) for general pass through events and Essential Water's considerations for nominated pass through events for the Broken Hill region.[58]

*Regulatory change event*

1. *A change in a regulatory obligation or requirement that:*
    a) *falls within no other category of pass through event; and*
    b) *occurs during the course of a regulatory control period; and*
    c) *substantially affects the manner in which Essential Water provides regulated water or wastewater services (as the case requires); and*
    d) *materially increases or materially decreases the costs of providing those services.*

*and or*

2. *A legislative or administrative act or decision that:*
    a) *has the effect of:*
        i. *substantially varying, during the course of a regulatory period, the manner in which Essential Water is required to provide a regulated service; or*
        ii. *imposing, removing or varying, during the course of a regulatory control period, minimum service standards applicable to regulated water or wastewater services; or*
        iii. *altering, during the course of a regulatory control period, the nature or scope of regulated water or wastewater services provided by Essential Water; and*
    b) *materially increases or materially decreases the costs to Essential Water provider of providing regulated water or wastewater services.*

    *and or*

3. *A tax change event occurs if:*
    a) *any of the following occurs during the course of a regulatory period for Essential Water:*
        i. *a change in a relevant tax, in the application or official interpretation of a relevant tax, in the rate of a relevant tax, or in the way a relevant tax is calculated;*
        ii. *the removal of a relevant tax;*

[58] AER FINAL DECISION Essential Energy distribution Determination 2015−16 to 2018−19 Attachment 15 – Pass through Events, April 2015. Page 15-6.

*iii. the imposition of a relevant tax; and*

*b) in consequence, the costs to Essential Water of providing regulated water or wastewater services are materially increased or decreased.*

**Drought relief event**

A drought relief event occurs if:

5. Essential Water is directed by Government to undertake capital investment to ensure availability of water supply to customers in the Broken Hill region as a result of drought relief measures, and/or
6. Essential Water is directed by Government to undertake maintenance activities to ensure availability of water supply to customers in the Broken Hill region as a result of drought relief measures, and
7. Essential Water incurs costs beyond those costs (if any) allowed by IPART for drought relief in the 2019-23 determination allowed, and
8. the costs beyond the allowances contained in the 2019-23 IPART determination materially increase the costs to Essential Water in providing regulated services.

**Wentworth to Broken Hill Pipeline event**

A Wentworth to Broken Hill Pipeline event occurs if:

9. 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 (if any) in the Essential Water determination,
10. 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 for electricity, chemicals and or providing emergency water supply in the event of the operation of the Wentworth to Broken Hill pipeline,
11. 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 Wentworth to Broken Hill pipeline, or
12. 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.

**Consequential works event**

A consequential works event occurs if:

13. Essential Water does not obtain Government funding for some or all of the projects identified as ‘consequential works’,
14. in Essential Water’s reasonable assessment, the works are required to ensure the availability of water supply to customers and to maintain current service standards in the Broken Hill region, and
15. Essential Water has used reasonable endeavours to access any other funding sources for the required consequential works, including through direct negotiation with affected customers as practicable, but have been successful in negotiating such funding over an acceptable period (i.e. three months).

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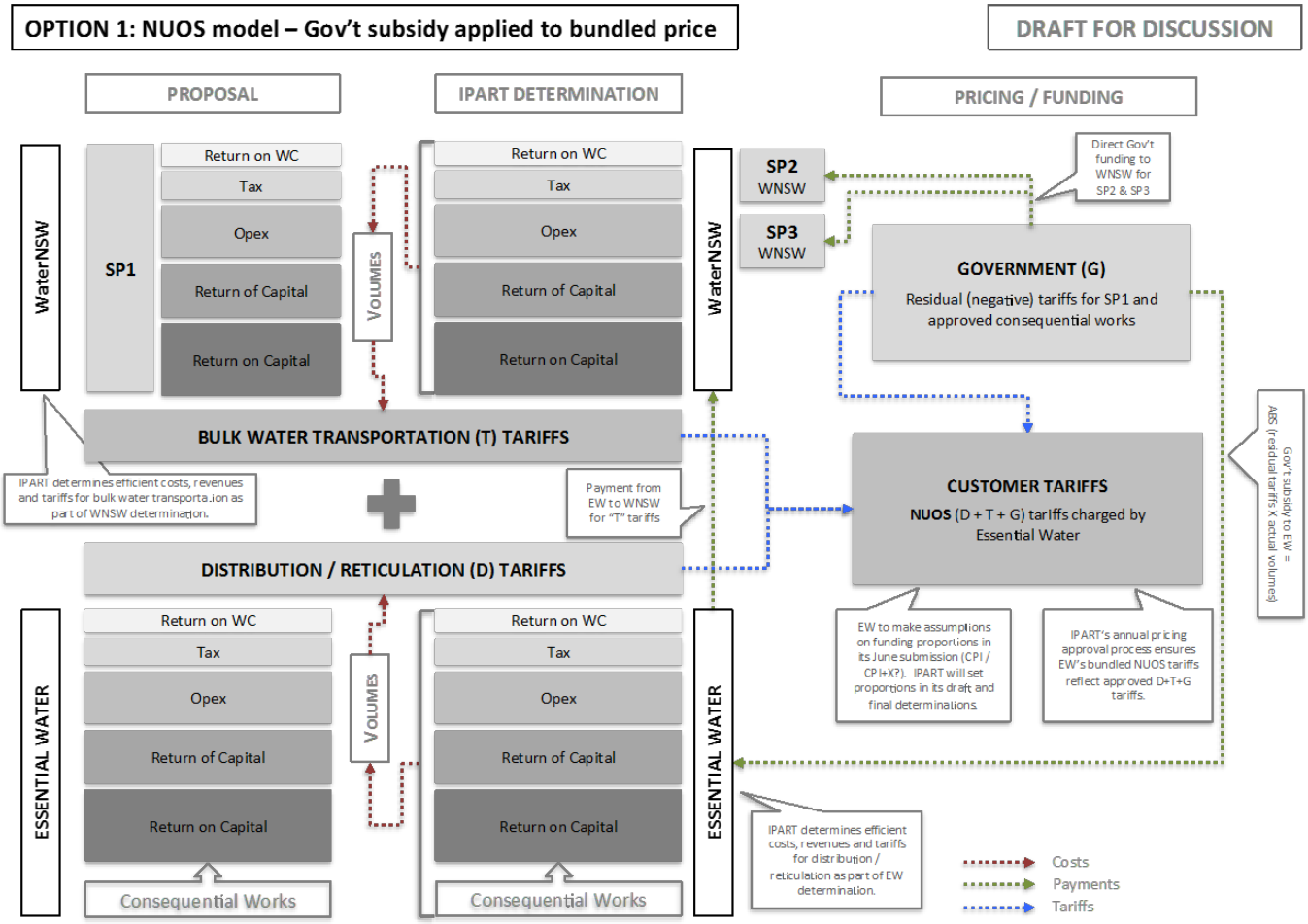
# Appendix 5 – Cost, tariff and funding flows for the new supply arrangements



# Appendix 6 - Outstanding issues from 2014 Determination

| Item | Description of outstanding issue | How issue is addressed |
|---|---|---|
| 1 | **Asset management**<br><br>*We consider that improved asset management and options analysis is particularly likely to yield savings in this context, where the forecast capital expenditure program is large and diverse relative to previous years. Improved asset management and options analysis is also particularly important when considering a large capital expenditure program in an area where population numbers have been declining, as has been occurring in Broken Hill*. **(IPART 2014 Determination, Page 5**)<br><br>*SKM further comments that Essential Energy recognises the need for an 'asset management improvement journey' and has identified this as a key strategic objective in its WAMP.*<br><br>*SKM also found that an equivalent Sewer Asset Management Plan is not yet prepared, but Essential Energy intends to develop and include one in its WAMP.* **(IPART 2014 Determination, Page *79)*** | Essential Water has continued to improve and enhance its approach to asset management as set out in:<br><br>* Chapter 6 'Capital expenditure',<br>* Confidential Attachment 4 'Water Strategic Plan', and<br>* Confidential Attachment 5 'Water Asset Management Plan' (discussed in detail in Section 3 'Asset management framework').<br><br>Attachment 5 'Water Asset Management Plan' has been updated to include sewerage assets in the Water Asset Management Plan as suggested by IPART's consultant from 2014 (SKM) (see Section 4.8 'Phased sewerage investments', Section 8.3.3.8 'Reticulation components breakdown and Section 8.3.3.9 'Treatment Plants'). |
| 2 | **Demand volatility adjustment mechanism**<br><br>*We also note that in our next price review, we will consider how to address any variations between forecast and actual water usage revenue over the 2014 determination period (see Section 3.7).* **(IPART 2014 Determination, Page 42**)<br><br>*At the next determination of Essential Energy's prices, IPART will consider an adjustment to the revenue requirement and prices to mitigate any over or under-recovery of revenue over this determination period due to material differences between the level of water sales over the determination period and the forecast water sales used in making this determination.* **(IPART 2014 Determination, Recommendation 6, Page 15**) | Essential Water's approach to addressing variations between forecast and actual water usage over the 2014 determination period is discussed in Chapter 2 'Form of regulation' (Section 3.2.1)<br><br>While it appears that there may be a significant shortfall in revenues due to lower volumes than allowed by IPART in 2014, Essential Water is not seeking the demand volatility adjustment mechanism for the 2014 period to |

| Item | Description of outstanding issue | How issue is addressed |
|---|---|---|
| | | be triggered at this time in recognition of affordability concerns for customers in the region. |
| 3 | **Efficiency initiatives**<br><br>*Essential Energy reported that it will continue to pursue its efficiency measures into the next regulatory period. It indicated that some of the efficiency initiatives that have led to a reduction in overhead costs include a reduction in staff numbers through a hiring freeze and natural attrition, and reductions in overtime, agency staff, fleet, marketing and travel costs.* **(IPART 2014 Determination, Page 57**) | Essential Water has continued to pursue efficiency initiatives in order to keep downward pressure on water and sewerage prices. Essential Water's approach to efficiency initiatives is discussed in:<br><br>* our 'plain English' Overview, and<br>* Chapter 7 'Operating expenditures' (Section 7.6). |
| 4 | **Wills Street waste water treatment plant**<br><br>*Capital expenditure on Wills Street sewerage treatment plant was reduced and deprioritised until a decision was made on the future of the plant. Originally, Essential Energy was planning to refurbish the plant but, following a review by the NSW Department of Public Works, it is now considering replacing the plant in its entirety.* **(Essential Water submission to 2014 Determination, Page 75)** | The largest and most significant project in our proposed capital program is the $34 million Wills Street wastewater treatment plant. Built in the 1930s, the plant is nearing the end of its useful life and needs to be replaced to ensure we can comply with our environmental obligations.<br><br>The Wills Street wastewater treatment plant is discussed in the following locations:<br><br>* our 'plain English' Overview,<br>* Chapter 6 'Capital expenditures' (Section 2.5 and 2.6),<br>* Confidential Attachment 4 'Water Strategic Plan' (discussed in Section 12, Project 13), and<br>* Confidential Attachment 5 'Water Asset Management Plan' (discussed in Section 8.3.3.9 'Sewerage treatment plants'). |
| 5 | **Rocky Hill service reservoir**<br><br>*Therefore, we did not allow the majority of expenditure* | Essential Water proposes to |

| Item | Description of outstanding issue | How issue is addressed |
|---|---|---|
| | *for the Rocky Hill Service Reservoir project as subsequent advice from SKM indicated that there is a case for delaying the Rocky Hill Service Reservoir project until the next determination period (ie, from 2018/19).* **(IPART 2014 Determination, Page 86**) | install an additional smaller water service reservoir at Rocky Hill to allow the existing service reservoir to be taken off-line and re-lined during low demand periods. This project is discussed in the following locations:<br><br>* Chapter 6 'Capital expenditures' (Section 2.6.2),<br>* Confidential Attachment 4 'Water Strategic Plan' (discussed in Section 12, Project 5), and<br>* Confidential Attachment 5 'Water Asset Management Plan' (discussed in Section 8.3.3.5 'Tanks'). |
| **6** | **Exempt customers**<br><br>*We have accepted Essential Energy's forecast customer numbers. We considered them to be reasonable as they are supported by information from the ABS and NIEIR. However, in modelling prices, we have added* ***exempt property numbers*** *to the forecast property numbers initially supplied by Essential Energy.* [Emphasis added.] **(IPART 2014 Determination, Page 106)**. | Under the NSW Water Management Act 2000 (the Act), certain customers, such as some schools, hospitals, churches, and charitable organisations are exempt from paying access charges. This means we cannot charge these customers an access charge. As IPART includes exempt customer numbers when calculating our availability charges, and we are not able to charge exempt customers the availability charge, we are currently unable to recover our efficient costs while complying with the Act without seeking separate Government funding or setting separate cost-reflective tariffs for exempt customers.<br><br>This matter is discussed in the following locations:<br><br>* Our 'plain English' Overview,<br>* Chapter 2 'Form of regulation' (Section 7.2), and<br>* Chapter 12 'Tariff structures and price path' (Section 5.5). |
| **7** | **Cost pass through – reverse osmosis plant** | |

| Item | Description of outstanding issue | How issue is addressed |
|---|---|---|
| | However, for this determination, we decided not to introduce a cost pass- through (or price adjustment) mechanism for increases in marginal costs as a result of the reverse osmosis plant's operation. This is because experience suggests the plant will be used very infrequently, if at all, over the determination. Our analysis shows that the water usage prices we have set should, on average, cover the marginal cost of water supply over the determination period.<br><br>However, in the event that Essential Energy is required to use its reverse osmosis plant in accordance with its rules for operation, and this has a material adverse impact on its financial position, then we would consider the case for an early review and determination. **(IPART 2014 Determination, Page 114).** | Essential Water's approach to cost pass through events is discussed in the following locations:<br><br>* Our 'plain English' Overview,<br>* Chapter 2 'Form of regulation' (discussed in detail in Section 5.5), and<br>* Appendix 4 'Pass through events'<br><br>Essential Water has not sought (and is not seeking) an early review and determination due to the operation of the reverse osmosis plant. |
| **8** | **Financeability**<br><br>*In order to achieve and maintain a gearing level of 55%, Essential Water would need to receive an initial equity injection at the start of the regulatory period to bring the gearing level down to 55% and then maintain this gearing level over the regulatory period.*<br><br>*In summary, Essential Water would not face financeability issues during the upcoming regulatory period if it managed its capital structure as would be appropriate for a similar commercial business. We recommend that Essential Water's management and shareholders consider this issue.* **(IPART 2014 Determination, Page 13**).<br><br>*Below we provide an indicative analysis setting Essential Water's actual gearing at the more appropriate gearing level of 55% (our benchmark used in the determination). We found that under these assumptions, Essential Water would be financeable over the regulatory period – as its indicative financial ratios would meet our Baa2 benchmark floor. In order to achieve and maintain a gearing level of 55%, Essential Water's shareholders would need to provide an initial equity injection at the start of the regulatory period to bring the gearing level down to 55%, and then maintain this gearing level over the regulatory period.* **(IPART 2014 Determination, Page 142).** | Essential Water has addressed issues of financeability in the following sections of our submission:<br><br>* Our 'plain English' Overview,<br>* Chapter 11 'Revenue requirement' (discussed in Section 4), and<br>* Confidential Attachment 8 'Metro model – revenue and pricing model' (Worksheet 'RegFin - Table 3' and Worksheet 'Scenario').<br><br>Based on the credit rating metrics calculated in Attachment 8 in the locations set out above, the revenues and prices proposed by Essential Water would result in an indicative credit rating in the Baa2 / Baa3 range.<br><br>Essential Water supports IPART's use of the financeability test and encourages IPART to ensure that its determination supports an indicative credit rating that is 'investment grade' of Baa2 or above. |

# List of Attachments

| Attachment # | Attachment Name | Confidential (Yes / No) |
|---|---|---|
| Attachment 1 | Stakeholder Engagement Framework | No |
| Attachment 2 | Community Feedback Report | No |
| Attachment 3 | Essential Water Survey Report – Woolcott | No |
| Attachment 4 | Essential Water Strategic Plan_CONFIDENTIAL | Yes – contains sensitive employee and cost information |
| Attachment 5 | Essential Water Asset Management Plan_CONFIDENTIAL | Yes – contains sensitive cost information |
| Attachment 6 | How our Water Prices are Determined | No |
| Attachment 7 | Annual Information Return (AIR) / Special information Return (SIR) _CONFIDENTIAL | Yes – contains sensitive mines data |
| Attachment 8 | Metro Model – Revenue and Pricing Model_CONFIDENTIAL | Yes – contains sensitive mines data |
| Attachment 9 | Completed IPART Submission Checklist | No |