IPART
Independent Pricing and Regulatory Tribunal
New South Wales

REVIEW OF PRICES FOR
SYDNEY WATER
from 1 July 2020

Draft Report

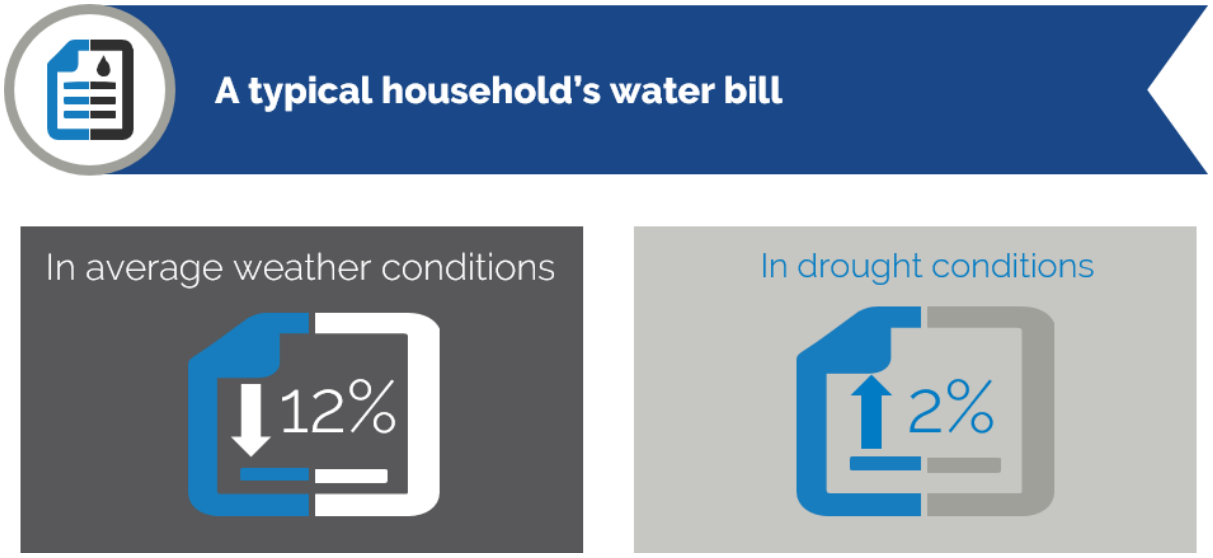
IPART has set draft prices for Sydney Water's customers from 1 July 2020

Sydney's population is growing, increasing our need for water.

Until recently, the region was facing severe drought, with dam levels falling at an unprecedented rate.

While recent rain has taken the immediate pressure off the system, it has shown how variable our climate has become.

We propose more flexible prices so customers have **more control** over their bills, allowing Sydney Water to deliver **record investment**, and ensuring households benefit from **lower bills** in these uncertain times.



This overview sets out our draft decisions on prices and underlying efficient costs, as well as:

- What our decisions mean for residential and non-residential customers
- How our decisions vary from what Sydney Water proposed
- How you can provide feedback on our draft decisions

IPART's role

We set the maximum prices that Sydney Water can charge for its water, wastewater and stormwater services. We also set maximum charges for its trade waste services, and a range of ancillary and miscellaneous services.

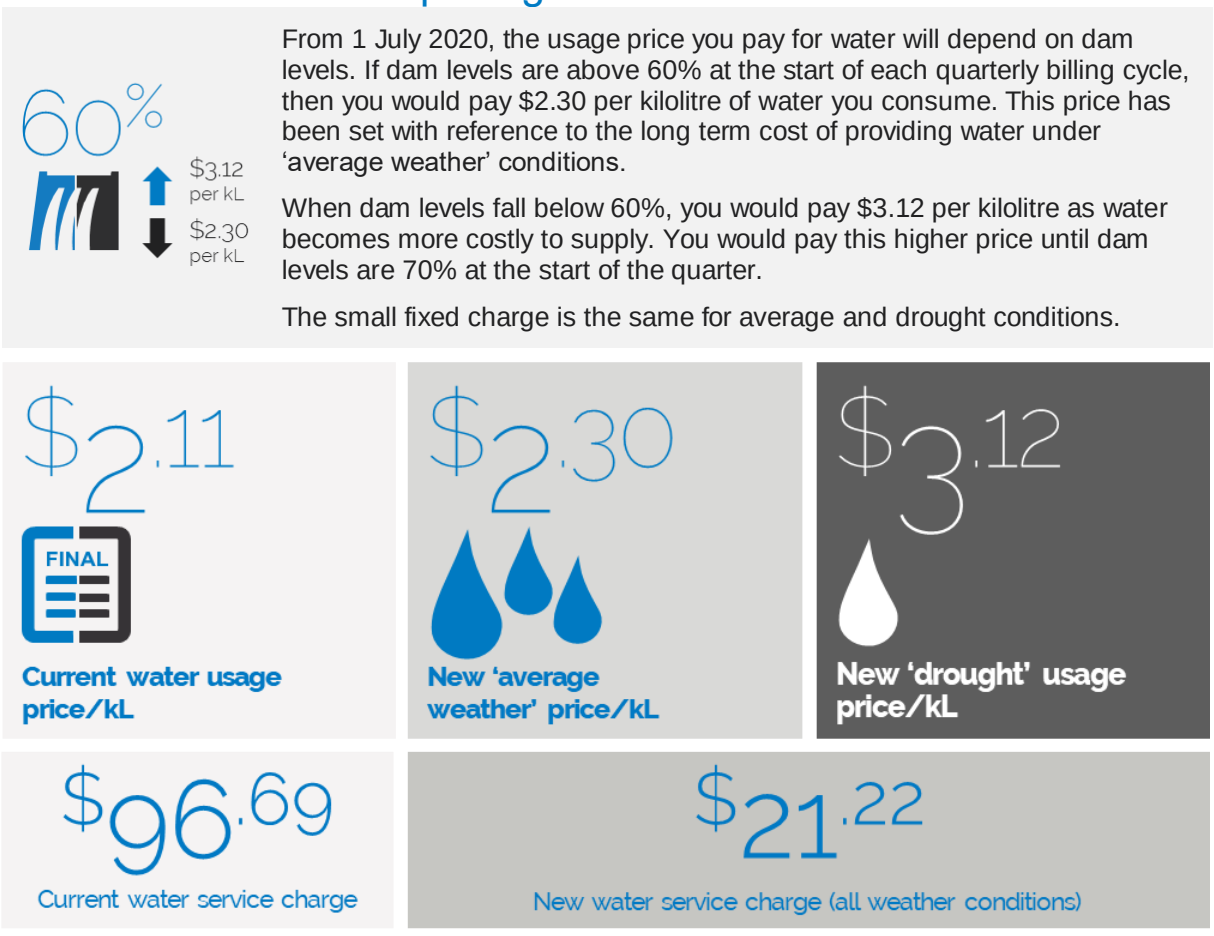
We are implementing flexible pricing

Households pay a water usage charge, and a fixed charge for water and wastewater services, and in some cases a stormwater charge. Some non-residential customers also pay a usage charge for wastewater, and trade waste prices.

In light of recent drought conditions, our draft decision is to implement flexible water usage pricing. With dam levels currently plentiful, bills would fall for almost all customers from 1 July. But if drought conditions return, the water usage price would be higher. This allows Sydney Water to recover increased costs in drought, and enables customers to manage these costs by adjusting their consumption. But it does not lock in higher prices when dams are full.

At the same time, we are reducing the service charge for water, meaning customers can save money during these uncertain times. Our draft decision is to:

How does our flexible pricing work?



The table below summarises our draft prices for 2020-2024. The water and wastewater service charges for non-residential customers are a multiple of the residential charges in the table, and vary based on the size of your meter.

Current and proposed prices

	Current price	Sydney Water proposed price	IPART draft decision
Water usage charge ($/kL)	2.11	2.11	2.30 (average weather)
			3.12 (drought)
Water service charge ($/year)	96.69	97.54	21.22
Wastewater usage charge ($/kL)	1.17	0.61	1.17
Wastewater service charge ($/kL)	614.85	562.75	516.03

Your bill

The decrease in service charges and increase in the water usage charge means your bill is in your hands – if you reduce your water use, you reduce your bill.

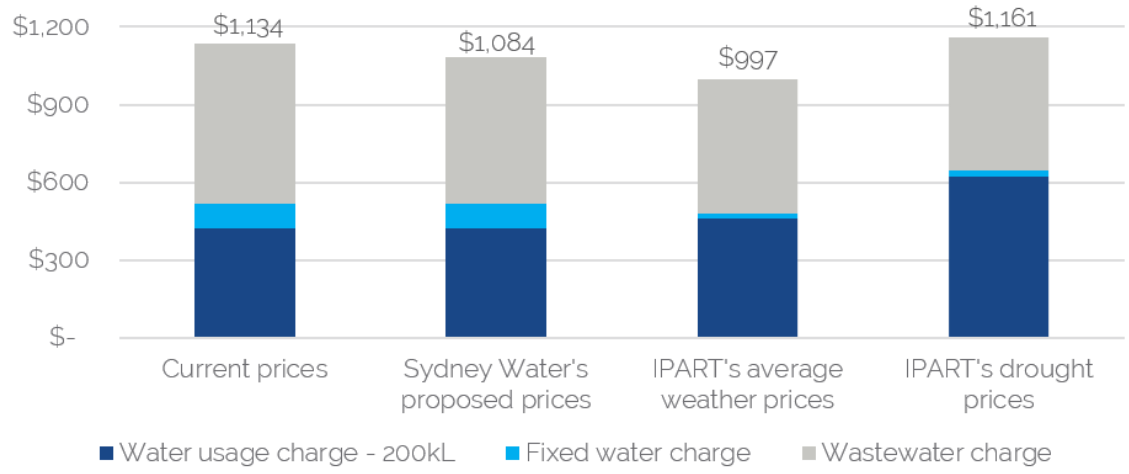
A household using 200kL of water per year would see a decrease in their bill of around 12% during normal weather periods.

In drought, prices would be about 2% higher than they are currently. This household could avoid a bill increase by reducing its water use by 4%.

The decrease in bills in normal weather periods is driven by a combination of lower interest rates and our decisions on Sydney Water's expenditure.

To see the impact for your bill, check out our bill calculator.

A typical household bill under our draft decision...



Promoting resilience through record capital and contingent expenditure

In light of Sydney's increasingly variable climate and growing population, our draft decision allocates record capital expenditure to Sydney Water. We recognise the need for Sydney Water to invest in its network to keep levels of service high and build resilience to drought, as well as meet its environmental obligations. At the same time, we did not find that all of Sydney Water's proposal expenditure is efficient. We propose to allocate the following:

$4.2bn

Base capital expenditure for 2020-2024

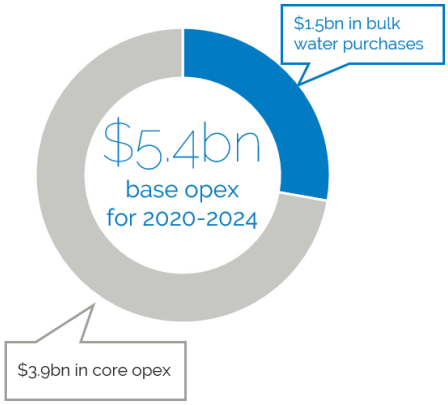
This is 18.4% lower than Sydney Water's proposal

$436m

Cost pass through allowance

This is to cover costs associated with upgrading the network if the Sydney Desalination Plant is expanded

Sydney Water's efficient operating expenditure has risen with population and drought. Our draft decision is to allow:



This is **3.9%** less than proposed by Sydney Water.

We found that Sydney Water's proposed spending increase to maintain water and wastewater pipes was partly due to insufficient maintenance in the previous four years.

We have allowed for additional opex of $80 million per year in drought periods.

Our expenditure decisions include a *continued efficiency factor* of 0.8% per annum, to ensure that Sydney Water continues to drive for efficiencies.

Sydney Water would recover $10bn of revenue from customers over the 2020 period.

$10bn

Efficient costs to be recovered by prices

Getting value for everyone by holding Sydney Water to account

We considered how to encourage Sydney Water to continually improve its performance, and publish better information to facilitate planning and encourage competition in the long-term interests of customers.

Understanding the long-run costs of providing water

We recommend Sydney Water collaborate more closely with stakeholders to better understand the long-run costs of providing water. A better understanding of how these costs are influenced by the option of using purified recycled water for drinking would signal the potential value of recycled water to the market.

Publishing estimates of wastewater costs by area

We have published estimates of Sydney Water's long-run costs of providing wastewater services by area, and have asked Sydney Water to improve on these estimates. This information can help to signal where it is most beneficial to invest in recycled water schemes and facilitate the efficient entry of private sector water providers into the market.

Comprehensive water conservation reporting

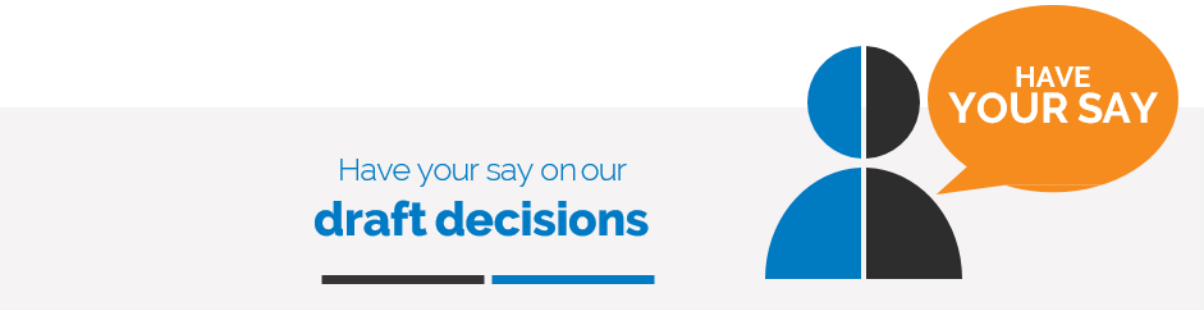
We are consulting on more frequent and comprehensive reporting by Sydney Water on its water conservation targets. We want Sydney Water to meet its targets for leakage, demand management and water recycling, particularly during drought.

Additional spending to improve environmental outcomes

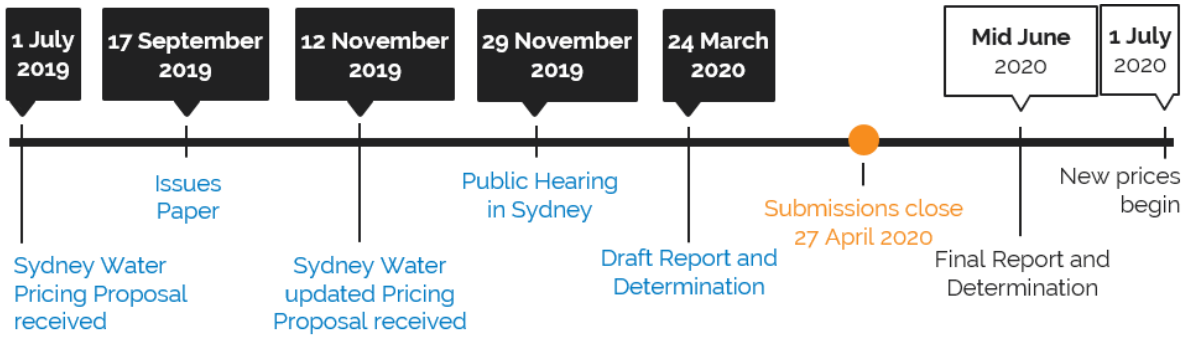
We have approved almost $80 million in discretionary spending to allow Sydney Water to improve waterway health. But Sydney Water could do more to understand what its customers are willing to pay for improved environmental outcomes.

Thanks to recent rainfall, Sydney is no longer in immediate need of additional water sources. **But now is not the time for complacency.** We would like to collaborate with Sydney Water, NSW Government, and other stakeholders to better understand the long-term costs of providing water. In particular, we will work to refine cost estimates associated with different augmentation options, and further develop our framework for valuing water.

We are seeking feedback



We invite submissions from all interested parties, which we will consider before making our final decisions and releasing our Final Report and Final Determination in June 2020.



Contents

2 Our draft decisions

In this review we are setting the maximum prices Sydney Water can charge its customers for water, wastewater, stormwater and other miscellaneous and ancillary services.[1] These prices allow Sydney Water to meet the service standards prescribed in its operating licence and other regulatory requirements (such as those imposed by the Environment Protection Authority). They may also allow Sydney Water to meet service standards above those imposed by regulatory requirements, through 'discretionary' expenditure, if there is sufficient evidence that Sydney Water's customers are willing to pay for these outcomes.

Further detail on our role and our review process is included in Appendix C.

This chapter outlines:

- The key themes influencing this review, and
- Our key draft decisions.

A complete list of our draft decisions is included in the final section of this chapter.

2.1 The key themes influencing this price review

For this review, five key themes have affected our draft decisions:

1. The need for flexible water usage prices in 'average weather' and drought conditions.
2. Sydney Water's operating environment and cost drivers.
3. The costs of servicing new development and the low interest rate environment.
4. The need for better information on long term costs of providing water and wastewater.
5. How we can set prices to encourage Sydney Water to better understand its customers' preferences.

Flexible water usage prices for 'average weather' and drought conditions

In its November 2019 update to its pricing proposal, Sydney Water put forward information on how its business is affected by drought and proposed cost pass-throughs to manage drought. The significant rainfall event in February 2020 has meant that we are no longer in drought, with dam levels currently over 80%.[2] However, the variability in the weather conditions experienced within the space of 3 months has highlighted the need to consider flexible water pricing.

1 These are monopoly services that we review under Section 11 of the Independent Pricing and Regulatory Tribunal Act 1992 (NSW) (the IPART Act).
2 WaterNSW, Regional water availability report, Weekly edition, 19 March 2020, p.3.

Our draft decision is to set a water usage price based on average weather conditions, in light of the recent rise in dam levels. We have then set a drought usage price, which is triggered when dam levels fall below 60%.

In drought, the usage price would increase to reflect the costs of managing drought, which include short-term investments to conserve water and reduce leakage as dam levels fall. Our draft decision sends a stronger signal to customers to conserve water in periods of scarcity, without locking in higher prices when dams are full.

Our draft decisions on water usage prices are detailed in Chapter 6.

Sydney Water's operating environment and cost drivers

For this determination period, Sydney Water has proposed a 103.7%, or $2.8 billion, increase in its capital expenditure, above the amount allowed in IPART's 2016 determination period ($2.7 billion).[3] Sydney Water has also proposed a 3.8%, or $200 million, increase in its operating expenditure over that allowed under the previous determination ($5.3 billion).[4] The request for greater expenditure is driven by the extra costs of providing services to Sydney's growing population, as well as a change towards a more proactive asset-management strategy, partly driven by a need to address recent deterioration in the environmental performance of Sydney Water's wastewater network.

We engaged expert consultants Atkins Cardno (Atkins) to review Sydney Water's historical capital expenditure, its proposed operating and capital expenditure, and assess whether Sydney Water's proposed expenditure is efficient. Our findings and draft decisions regarding Sydney Water's capital and operating expenditure for the determination period are outlined in Chapters 3 and 4.

The costs of servicing new development and low interest rates

A key driver of Sydney Water's proposed increase in investment is to meet the costs that it incurs to service new developments as Sydney's population expands. For many water utilities, a 'developer charge' is levied on a developer, to provide a signal to the developer about the costs of servicing new properties. In contrast, because developer charges are set to zero for Sydney Water, these costs are instead added to Sydney Water's Regulatory Asset Base (RAB) and gradually recovered from the broader customer base. This means that over time the costs of servicing new growth accumulate and place upward pressure on prices for all customers, potentially reducing the affordability of bills.

In the short-term, the current low interest-rate environment has meant Sydney Water has been able to propose a small bill reduction for the 2020-24 determination period, even as it proposes large increases in capital and operating expenditure. However, over the medium to long term, if interest rates stop falling or begin rising, continued high expenditure could cause prices to rise and customer bills to increase.

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3 Sydney Water, Keeping Sydney liveable, productive and thriving for a sustainable future: Update to 1 July Price Proposal, 12 November 2019, p.6, footnote 4; IPART calculations.

4 Sydney Water, Keeping Sydney liveable, productive and thriving for a sustainable future: Update to 1 July Price Proposal, 12 November 2019, p.7, footnote 5; IPART calculations.

The need for better long term price signals

We have set water usage prices with reference to the long-run marginal cost (LRMC) of providing water. LRMC signals the costs of supplying water to meet demand over the long term. It provides customers a signal about the long-term costs of consuming water.

We set the water usage price with reference to LRMC, using information provided by Sydney Water on the future costs of water supply augmentations. However, our analysis of Sydney Water's LRMC modelling identified a number of limitations, and we consider Sydney Water should work more closely with relevant stakeholders, including IPART and the Department of Planning, Industry and Environment, to develop robust, long-term supply options that inform its LRMC estimates, under a range of scenarios. This is detailed further in Chapter 6.

Our view is that the wastewater usage price should also be set with reference to LRMC. Setting wastewater prices with reference to the long-run costs of supplying wastewater services can signal where it is most efficient to invest in water recycling schemes.

In this review, we have estimated Sydney Water's LRMC of providing wastewater services by area. However, as our estimates were based on limited information, we have decided to maintain the wastewater usage price at its current level ($1.17/kL) for the time being. Instead, we have asked Sydney Water to work on improving these estimates, which would allow the wastewater usage price to be set with reference to LRMC in future. This is detailed further in Chapter 7.

Understanding customer preferences

Prior to submitting its pricing proposal to IPART, Sydney Water conducted a customer engagement program to understand the preferences of its customers, undertaking a range of different customer engagement techniques such as willingness to-pay surveys, online choice surveys, discussion and forum groups. Sydney Water used this process to identify two projects where it proposed additional investments to deliver environmental outcomes above current licence and environmental obligations. These "discretionary" projects, and our draft decisions on these projects, are discussed in Chapter 9.

In our view, the customer engagement process undertaken by Sydney Water as part of this pricing review is a significant improvement compared with its 2015 pricing proposal.

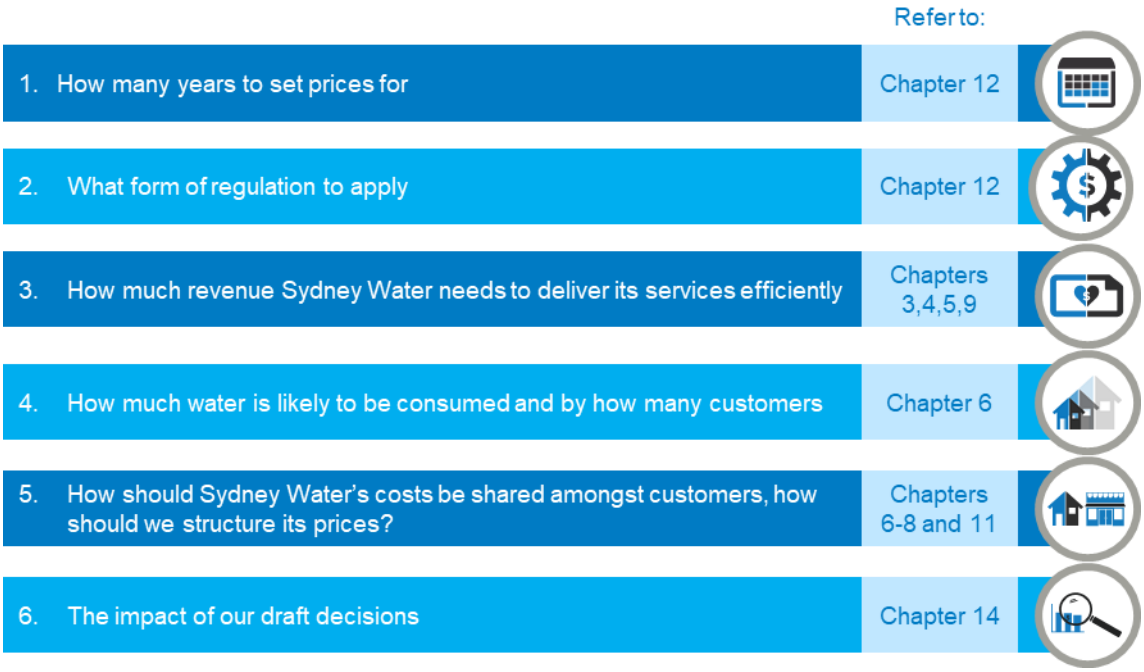
Although generally positive, Sydney Water should continue to do more to better understand its customers' preferences for different levels of service quality and prices, as well as improving its customers' awareness of the impact of Sydney Water's activities on environmental outcomes.

We acknowledge Sydney Water's response to our Issues Paper, where it expressed a willingness to work with IPART, stakeholders and customers to move towards a more outcomes-based, customer driven regulatory framework. To that end, we will commence a public review of how our regulatory framework for water utilities can be refined, following the completion of our Final Report for this pricing review.

2.2 Our key decisions

The key decisions we made in our review, including where you can find them in this report, are outlined in the following figure.

Figure 2.1 Key decisions in this price review



2.3 Draft decisions

Our draft decisions on key issues are outlined below.

Table 2.1 Draft decision on revenue requirement issues

Topic	IPART's Decision	Rationale
Capital expenditure - historical	Set efficient expenditure at $3.2 billion between 2016-17 and 2019-20.	Our view is that Sydney Water's historical capital expenditure was, for the most part, efficient.
Capital expenditure - forecast	Efficient expenditure is $4.2 billion over the 2020 determination period. A reduction of Sydney Water's proposed capital expenditure by $0.9 billion.	We reduced Sydney Water's proposed expenditure allowance by $935 million, taking into account the advice of our expert consultants. We applied a continuing efficiency factor of 0.8% per annum, reducing capital expenditure by an additional $83 million over the 2020 determination period.
Operating expenditure	Set efficient operating expenditure over the 2020 determination period at $5.4 billion. A reduction of Sydney Water's proposed expenditure of $0.2 billion.	Minor adjustments to some operating expenditure items. Apply a continuing efficiency factor of 0.8% per annum, broadly consistent with Sydney Water's efficiency challenge.

Cost pass through	Include additional operating expenditure, of about $80 million per year, as a drought pass-through. Include an adjustment for the impact of water restrictions on demand, during drought. Accept Sydney Water's proposed network expansion costs if SDP is expanded.	Our drought water usage price would recover the efficient operating costs, and the impact of water restrictions on demand, during drought. We would include Sydney Water's network expansion costs as an uplift to the water service charge, if the Government decides to expand SDP.
Return on assets	We have set the WACC at 3.2%.	We calculated the WACC using our standard methodology, applying updated market information.
Output measures	We have set output measures to: ▼ Track the progress of discretionary expenditure and ensure Sydney Water's customers are informed on discretionary expenditure. ▼ Monitor Sydney Water's performance on leakage and water conservation. We have rationalised existing output measures.	This will hold Sydney Water accountable on the progress of its discretionary expenditure and ensure it collects relevant information to inform our next review. Our increased monitoring of leakage and water conservation should encourage better performance by Sydney Water on these measures.

Table 2.2 Draft decision on pricing issues

Topic	IPART's Decision	Rationale
Prices – Water usage price	Set a base usage price of $2.30/kL during average weather conditions, and apply an uplift during times of drought (when dam storages are 60% or below). The drought usage price is $3.12/kL.	Base water usage price is set with reference to Sydney Water's estimate of LRMC. The drought price reflects additional expenditure from drought and sends a price signal to customers on the increased value of water during periods of scarcity.
Water service price	Set a water service charge of $21.22 ($2019-20) for residential/ non-residential customers on 20mm meters.	Service charge is calculated as a residual after the revenue raised from the usage charge.
Prices – Wastewater services	Maintain the usage price of $1.17/kL ($2019-20) for non-residential customers, and a base service charge of $454.05. Remove previous discharge allowance component from service charge for non-residential customers.	This reflects our preference to set the wastewater usage price with reference to LRMC in the future. Improved transparency, simplicity and cost-reflectivity of non-residential service charges by removing the discharge allowance.
Prices – Stormwater services	Maintain the way we set stormwater prices, and set prices using our draft expenditure allowances and WACC.	The current method of setting prices is appropriate.
Trade waste charges	Largely accept Sydney Water's restructured trade waste prices.	Sydney Water reviewed its prices in line with our recommendations in the last review.
Miscellaneous charges	Accept Sydney Water's proposed miscellaneous prices. Recommend Sydney Water review its Sydney Water Developer Direct (SWDD) prices.	Our consultants identified a number of incidental errors in the way SWDD calculates its prices, which has resulted in prices being too low for SWDD to generate a commercial rate of return.

Table 2.3 Draft decisions on other proposals

Topic	IPART's Decision	Rationale
Demand volatility	We will maintain the demand volatility adjustment mechanism (DVAM) for the 2020 determination period.	The DVAM provides an appropriate mechanism to manage uncertainty.
Efficiency carryover mechanism (ECM)	To maintain an ECM for controllable operating expenditure, and not extend it capital expenditure in this review.	This removes an incentive for the utilities to delay efficiency gains for operating expenditure. However, we have not identified a suitable incentive mechanism to apply to capital expenditure.
Unregulated pricing agreements	Maintain the option to enter into unregulated pricing and service level arrangements with large customers, and seek comment on how the term 'large customer' should be applied.	There has been no uptake of these agreements, but we do see a benefit to retaining the option of having them. There may be some confusion around the definition of a 'large customer'.
Discretionary projects	We have developed a discretionary expenditure framework. We have allowed Sydney Water to recover the costs of its proposed projects from residential customers.	Our framework will allow utilities to be responsive to customers' preferences while providing accountability for the delivery of proposed projects.
Drought cost pass-through mechanism	To reflect the increased costs in providing water during drought through an increase in the water usage price.	As above, recovering the costs of drought by increasing the water usage price signals to customers the increased value of water during periods of scarcity.
Recycled water	To continue to defer setting prices for these schemes.	Sydney Water's proposed prices are reasonable, as they are consistent with the pricing principles we developed in our 2019 Recycled Water review.[5]

2.4 Our draft decisions

[5] IPART 2019, *Review of pricing arrangements for recycled water and related services.*

52 To set a 4-year determination period. 116

53 To set a maximum price cap. 117

54 To maintain the efficiency carry-over mechanism for operating expenditure for the 2020 determination period. 117

55 To maintain an option to enter unregulated pricing agreements with large non-residential customers (defined as those with annual water consumption greater than 7.3 ML). 120

13 Output measures 122

56 To apply the output measures on discretionary and drought-related capital projects detailed in Table 13.1, for reporting to IPART in the pricing proposal for the next Determination. 122

57 To apply the output measures on water conservation, leakage and water recycling detailed in Table 13.2, for quarterly reporting to IPART. 122

2.5 Our recommendations

1 That Sydney Water: 115

- Review the Engineering Competency Requirements and require SWDD to meet the same standards as WSCs 115
- Review its quality management system and provide evidence that it satisfies the same criteria applied to prospective WSCs through the tender process. 115
- Revisit its assumptions for the allocation of staff time to SWDD activities and increase the utilisation rate it applies to the cost build-up. 115
- Formalise a level of service agreement between itself and SWDD for the provision of the SWDD software. 115
- Adjust the SWDD pricing model to base pricing on a rolling average number of applications as opposed to an anticipated flat rate. 115

2.6 Questions where we seek feedback

1 Do you agree with our draft decision to continue to exempt Kellyville Village customers from Rouse Hill stormwater drainage and land drainage charges? 84

2 Should the definition of large non-residential customers, who are eligible to enter into an unregulated pricing agreement with Sydney Water, be expanded to included customers whose water usage from multiple properties exceeds 7.3ML annually? What are the benefits and risks? 121

3 Should Sydney Water be made, through its Reporting Manual, to report publicly on a quarterly basis on the focus areas of leakage performance and water conservation? 131

3 Capital expenditure

This chapter sets out our assessment of Sydney Water's efficient level of capital expenditure. It discusses:

- Sydney Water's actual capital expenditure during the 2016 determination period.
- Sydney Water's proposed capital expenditure for the 2020 determination period.
- Our draft decisions on Sydney Water's proposals.

Under the building block method, capital costs are not recovered as they are expended. Instead, efficient capital expenditure is added to the Regulatory Asset Base (RAB) and recovered over time through allowances for a return on assets and regulatory depreciation (discussed in Appendix B).

As with operating expenditure, we engaged Atkins to review Sydney Water's historical and forecast capital expenditure and recommended the efficient amount to include in the RAB.

Our draft decision on the asset lives to apply to Sydney Water's existing and new assets is also outlined in this chapter.

3.1 Our draft decisions

We made draft decisions:

1 To adopt the values in Table 3.1 to set Sydney Water's efficient level of past capital expenditure to be included in the Regulatory Asset Base (RAB) for the 2016 determination period.

2 To adopt the values in Table 3.2 to set Sydney Water's efficient level of base capital expenditure to be included in the Regulatory Asset Base (RAB) for the 2020 determination period.

3 To accept Sydney Water's proposed contingent capital expenditure on network upgrades, to be recovered from prices, if a Government decision is made to expand the Sydney Desalination Plant (SDP).

Our draft decisions on Sydney Water's capital expenditure are to include:

- An efficient **historical capital expenditure allowance of $3,223 million for the 2016 determination period**. This is a 0.8% - or $27.1 million – reduction on Sydney Water's actual capital expenditure over the period, to reflect small scope adjustments consistent with our view of the level of efficient historical capital expenditure.

- A **base allowance of $4,151.8 million for the 2020 determination period**. This is a $935.4 million (18%) reduction from Sydney Water's proposal of $5,087.2 million.[6] As discussed further in Appendix E, this includes a continuing efficiency adjustment of 0.8% per annum across Sydney Water's capital program.
- A **cost pass-through allowance of up to $368 million for the 2020 determination period and $68 million for the 2016 determination period**. We have accepted Sydney Water's proposal for $436 million for network upgrades in response to the possible expansion of the Sydney Desalination Plant (SDP). As discussed in Chapter 6, this expenditure would only be recovered from prices if a NSW Government decision is made to expand SDP.

Table 3.1 Our draft decision on Sydney Water's efficient capital expenditure for the 2016 determination ($2019-20, $million)

	2016-17	2017-18	2018-19	2019-20	Total
Base capital expenditure					
Sydney Water's proposal	638.6	826.3	853.8	931.2	3,249.8
Scope adjustment	*(9.3)*	*(6.7)*	*(5.7)*	*(5.3)*	*(27.1)*
Total efficient capex	**629.3**	**819.5**	**848.1**	**925.9**	**3,222.8**
% Variance	*(1.5)*	*(0.8)*	*(0.7)*	*(0.6)*	*(0.8)*
Cost pass-through expenditure					
Sydney Water's proposal	0	0	0	68.0	68.0
Scope adjustment	*0*	*0*	*0*	*0*	*0*
Total efficient cost pass-through capital expenditure	**0**	**0**	**0**	**68.0**	**68.0**

Note: Totals may not add due to rounding.

Source: Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, Table 6-33 to Table 6-36, p 258; IPART Analysis.

Table 3.2 Our draft decision on Sydney Water's efficient capital expenditure for the 2020 determination period ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Base capital expenditure					
Sydney Water's proposal	1,532.7	1,200.9	1,204.7	1,148.9	5,087.2
Scope adjustment	*(409.7)*	*(112.7)*	*(163.8)*	*(166.3)*	*(852.6)*
Continuing efficiency	*(9.0)*	*(17.4)*	*(25.0)*	*(31.4)*	*(82.8)*
Total efficient base capital expenditure	**1,114.0**	**1,070.8**	**1,015.9**	**951.1**	**4,151.8**
Cost pass-through expenditure					
Sydney Water's proposal	220.8	147.2	0.0	0.0	368.0
Scope adjustment	*0*	*0*	*0*	*0*	*0*
Continuing efficiency	*0*	*0*	*0*	*0*	*0*
Total efficient cost pass-through capital expenditure	**220.8**	**147.2**	**0.0**	**0.0**	**368.0**

Note: Totals may not add due to rounding.

Source: Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2; Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, Table 8-2.

6 Nearly half, or $422 million of the reduction of $935.4 million, relates to the efficiency of constructing the Prospect to Macarthur Link, in light of the recent rainfall. This is discussed in Box 3.1.

3.2 Reasons for our draft decisions

Sydney Water proposed base capital expenditure of $5,087.2 million over the 2020 determination period.[7]

In making our draft decisions, we reviewed Sydney Water's historical capital expenditure and the savings it achieved over the 2016 determination period. We then considered the capital programs Sydney Water proposed for the 2020 period including whether the proposed expenditure is fully justified; and any potential further savings it could achieve through greater efficiencies in delivering its capital program.

We commissioned Atkins to assist us in our review. Atkins also undertook a strategic review of Sydney Water's long-term investment planning, asset management systems and processes, and demand forecasts. Our draft decisions on Sydney Water's capital expenditure reflect Atkins recommendations.

Actual capital expenditure over the 2016 determination period

We have accepted Atkins' recommendation to set Sydney Water's efficient level of capital expenditure over the 2016 determination period at $3,223 million. Our draft decisions and Atkins findings are explained in further detail in Appendix F.

Overall, Atkins found Sydney Water's capital expenditure in the 2016 determination period to be prudent, with two minor adjustments outlined further in Appendix F.[8]

7 Sydney Water update to 1 July Price Proposal, 12 November 2019, p 15.

8 The two adjustments are for a $14.6 million write-off to historical IT expenditure reflecting changes to the program of expenditure over the 2016 period, and a $9 million reduction to the historical waterway health expenditure to reflect actual expenditure, correcting a small error in Sydney Water's proposal. See Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 220 and 232.

Atkins considered the prudence of capital investments during the 2016-20 period, based on the information available at that time and how the investment was executed.

During the current determination period, 2016-20, Sydney Water has delivered a significantly larger capital expenditure program ($882 million p.a.) relative to the 2012-16 determination period ($772 million p.a.).

The most significant increases have been seen in water and wastewater services, with the primary drivers being 'Existing Mandatory Standards' and 'Growth'.

Water

- **Existing Mandatory Standards –** Critical water mains renewals and reticulation water main renewal are the two largest programs in the current determination period.
- **Growth –** rates of new development in the 2016-20 period were at unprecedented levels and this resulted in additional expenditure in the current period, relative to our 2016 allowance.

Wastewater

- **Existing Mandatory Standards –** expenditure on reticulation sewers has increased in 2017-18 and 2018-19, in response to Sydney Water's reclassification of all sewers that may overflow to waterways as critical.
- **Growth –** Similar to water, additional development has seen an increase in growth expenditure to service new properties. Over 2016-20, this line item represented $127 million.

Other

- **IT –** Additional IT expenditure on the 'Customer experience' platform also increased relative to 2016 estimates.

Proposed capital expenditure for the 2020 determination period

We have **set an allowance of $4,151.8 million** for Sydney Water's proposed base capital expenditure over the 2020 determination period, based on the analysis of Atkins'. The reasons for our allowance are explained in further detail in Appendix F.

Atkins recommend capital expenditure of $1,038 million p.a. over 2020-24 period. This is 18% lower than Sydney Water's proposal of $1,272 million but 29% higher than Sydney Water's spend over 2016-20.

Atkins considered that Sydney Water's approach to program development in applying adjustments and efficiency challenges top-down demonstrates increased maturity and willingness to respond to its regulatory environment. However, Sydney Water's proposal includes some scope for further efficiency.

Atkins found Sydney Water capital expenditure program over the 2020-24 period is generally based on bottom up evaluation of needs as documented in planning documents or analysis specific to the particular asset class and is documented in a series of 'Program Business Cases'. Sydney Water then subjected this bottom-up program to top-down adjustments, efficiency challenges and rephrasing to reach its proposed capital expenditure program.

Atkins identified scope for efficiency savings of $935.4 million over four years, the most significant of which are:

- **The need for the Prospect to Macarthur link (-$422.2 million):** In light of the recent significant rainfall, continuing with the Prospect to Macarthur link would not be prudent. This is discussed in further detail in Box 1.
- **General growth adjustment (-$236.1 million):** Sydney Water is projecting a similar average number of new connections in the 2020-24 period compared with the current period. Given this, Atkins consider it reasonable that water and wastewater growth capex should be set at the average expenditure level over the 2016 period. They have made a general adjustment to the proposed expenditure, as they have not been given a compelling justification for the scale of increase requested by Sydney Water.

  Sydney Water have stated the increase in growth expenditure partly reflects that growth is increasingly taking place in "greenfield areas", and the cost of servicing properties in these areas is higher than compared to infill development. In providing feedback to our draft decisions, we ask Sydney Water provide quantitative information to support these statements.
- **Reduced levels of applied efficiency (-$173 million):** Sydney Water did not subject two programs to the efficiency challenge (18% average level) it applied to the remainder of its asset renewals program.
  - Critical sewers and non-critical mains renewals (-$133 million)
  - Wet weather overflow abatement program (-$40 million)
- **Continuing efficiencies (-$82.8 million):** this reflects an efficiency factor of 0.8% p.a. and the scope for further efficiencies in the future period from new technology and innovation. This is discussed further in Appendix E.
- **Prudency of renewals (-$65.6 million):** improved evidence between asset condition and performance levels would better justify or strengthen the need for the proposed expenditure.

Atkins have also recommended increasing expenditure in some areas where it is required to maintain service levels, including:

- **Upper South Creek expenditure ($75.9 million):** reprofiling Sydney Water expenditure from 2019-20 to 2020-21 to reflect land purchase costs expected in 2021 in preparation to construct a wastewater treatment plant to service the South West and Western Sydney Aerotropolis Growth Area.
- **Wastewater pumping station (WWPS) civil works ($20 million):** increase in expenditure due to the need to undertake Level 2 inspections, following the failure of the North mead WWPS.

The impact of recent rainfall on proposed capital expenditure

We considered the impact of recent rainfall on the need for the drought capital investment projects detailed in Sydney Water's update to its 1 July 2019 price proposal (the update), submitted on 12 November 2019. The update proposed an additional $525 million of capital expenditure for two water supply system resilience and drought response schemes, namely:

- The Prospect to Macarthur Link (ProMac), and
- The Blue Mountains Cascade Supply Scheme.

We asked Atkins to provide advice on the need for this capital investment. Atkins submitted an addendum to its final report (see Appendix F) detailing its recommendations on the prudency of each drought scheme. Box 3.1 provides a summary of Atkins' recommendations, which we have made a draft decision to accept.

Box 3.1 The impact of recent rainfall on the need for drought capital investment

Recent weather events have highlighted the importance and challenge of sound water supply planning in the face of a variable and unpredictable climate. Good planning requires good information, and for all options to be on the table and costed.

In this context, we asked our consultants to review their recommendations on Sydney Water's proposed drought capital projects included in its baseline pricing proposal. These are:

- The Prospect to Macarthur Link, and
- The Blue Mountains Cascade Supply scheme.

With dam levels now at 80%[9], there is an opportunity for a comprehensive drought resilience study to be undertaken and costed to prepare for future drought events.

Atkins undertook a review of the projects in light of the recent change in conditions and recommended:

- All future expenditure on the Prospect to Macarthur Link (that is, all forecast expenditure for the 2020 period) should be deferred, because:
  - Dam storages are significantly in excess of (more than double) the construction trigger set out in the drought options study.
  - Deferring this scheme allows time for a comprehensive drought response and long term supply-demand plan to be developed.
  - There are benefits, in present value terms, of deferring this expenditure.
- All expenditure for the Blue Mountains scheme remains efficient, because it significantly increases the resilience of a part of Sydney Water's network, and the options study undertaken was robust.

Our draft decision is to accept Atkins' recommendations.

Table 3.3 Our draft decision on the Prospect to Macarthur Link ($2019-20, $million)

	2019-20	2020-21	2021-22	2022-23	2023-24
Sydney Water proposal	76.7	399.5	22.8	62.0	0.0
Our draft decision	76.7	0.0	0.0	0.0	0.0

Source: Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, p 7.

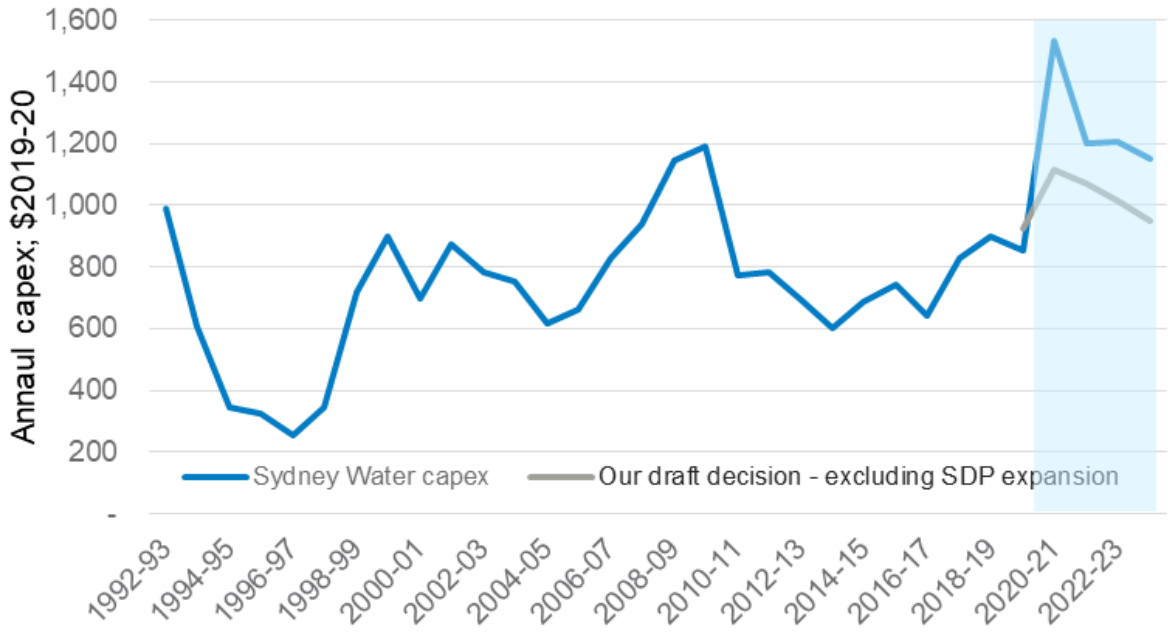
9 https://www.waternsw.com.au/supply/Greater-Sydney/greater-sydneys-dam-levels, 19 March 2020.

3.3 How do our draft decisions differ from Sydney Water's proposals?

Sydney Water's capital expenditure for the 2016 determination period was $3,250.1 million, which exceeded the IPART allowance of $2,695 million by $555 million (20%)[10]. Atkins considers Sydney Water's efficient level of capital expenditure is $3,223 million.

Our draft decision on capital expenditure for Sydney Water over the 2020 period is significantly higher than average expenditure since 1992, and is broadly consistent with the peak of expenditure over the millennium drought between 2006 and 2010, as illustrated in Figure 3.1.

Figure 3.1 Sydney Water capital expenditure profile over a 30 year timeline

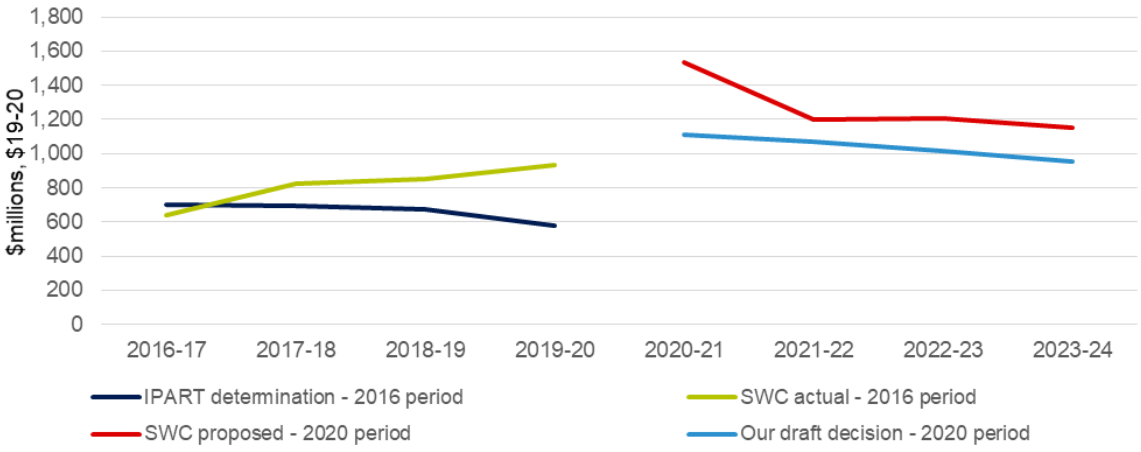


Source: IPART analysis; Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2

Further, our draft decisions on capital expenditure over the 2020 determination period are significantly higher than the capital expenditure Sydney Water spent over the 2016 period, as illustrated in Figure 3.2.

10 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 21.

Figure 3.2 Sydney Water capital expenditure profile – 2016 to 2024



Note: Expenditure for the 2020 period excludes expenditure on SDP upgrades.
Source: Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2; IPART analysis

3.4 We broadly accepted Sydney Water's proposed asset lives

We made a draft decision:

4 To adopt the asset life values in Table F.5, of Appendix F, when including capital expenditure in the RAB.

Our draft decision is to agree with Sydney Water's proposal that we continue to use the 2016 determination expected asset lives for new assets. To incorporate the finance lease capital expenditure into the water RAB, our draft decision is to calculate a weighted average expected life for water assets that includes finance lease assets (weighted by forecast capital expenditure).

Our remaining asset lives are very similar to those proposed by Sydney Water. Further information is provided in Appendix F.

4 Operating expenditure allowance

This chapter sets out our draft decisions on the efficient level of operating costs Sydney Water needs to provide its services over the 2020 determination period. These costs include Sydney Water's **core operating expenditure** on day-to-day items (such as labour, energy, materials, operating contracts, contractors) and **bulk water purchases** from SDP and WaterNSW (see Box 4.1 below for more information). It also includes our draft decisions on any additional expenditure that customers would pay to recover Sydney Water's costs of managing **drought**.

We engaged Atkins to review the efficiency of Sydney Water's proposed operating expenditure and recommend any efficiency savings that it considered that Sydney Water should achieve. Atkins has reviewed Sydney Water's July 2019 submission and its November 2019 update to its submission. With the extraordinary increase in dam levels in February 2019, Atkins has subsequently provided an addendum to its expenditure review final report and this has been reflected in our draft decisions.

We also considered the level of ongoing efficiency improvements that water utilities, including Sydney Water, should be able to make over the next four years.

Box 4.1 Sydney Water purchases 'bulk water' to supply its customers

To supply water to households and businesses, Sydney Water purchases 'bulk water' from WaterNSW and the Sydney Desalination Plant (SDP), before it transports treated water to a customer's tap.

Around 30%[a] of Sydney Water's proposed operating costs are for bulk water. Sydney Water does not own or operate the assets that produce bulk water, such as dams and desalination plants.

Concurrent to setting Sydney Water's prices to its customers, we are reviewing and setting the prices that WaterNSW charges Sydney Water for its bulk water costs. For more information, please see our Draft Report on our Review of prices for WaterNSW Greater Sydney from 1 July 2020. In 2017, we set the charges that SDP charges Sydney Water for the water it provides to Sydney Water.

a Sydney Water, Annual Information Return, 12 November 2019

4.1 Operating expenditure

We made draft decisions:

5 To set the efficient level of Sydney Water's baseline operating expenditure as shown in Table 4.1.

6 To set the efficient level of Sydney Water's cost pass through operating expenditure as shown in Table 4.1.

Our draft decision is to set Sydney Water's allowance for total base operating expenditure at $5,336.6 million over the 2020 determination period. This is made up of $3,889.2 million of core operating expenditure and $1,447.4 million in bulk water purchases from WaterNSW and

SDP. We have also included an allowance of up to $323.7 million per year, to recover Sydney Water's costs of managing drought. This drought cost pass-through is discussed further in this chapter.

As part of the Sydney Water price review, we have made efficiency and scope adjustments to Sydney Water's core and drought operating expenditures. Bulk water purchases are taken from our parallel IPART draft decisions on WaterNSW and SDP, which will incorporate efficiency adjustments recommended via those reviews.

Our core operating expenditure is $157.6 million (or 3.9%) lower than Sydney Water's November update to its submission.

Table 4.1 Draft decision on Sydney Water's efficient operating expenditure ($millions, $2019-20)

Item	2020-21	2021-22	2022-23	2023-24	Total
Core opex					
Water	469.8	472.3	468.0	463.1	1,873.2
Wastewater	470.8	467.8	448.7	442.7	1,830.0
Stormwater	14.4	14.6	14.6	14.8	58.4
Recycled water	32.7	32.3	31.3	31.2	127.6
Total core opex	987.6	987.0	962.7	951.8	3,889.2
Bulk water					
Water NSW	189.1	189.5	189.9	190.5	759.0
SDP	152.0	178.8	178.8	178.8	688.5
Total bulk water	341.1	368.3	368.7	369.3	1,447.4
Total base opex	**1,328.7**	**1,355.4**	**1,331.4**	**1,321.1**	**5,336.6**
Drought cost pass-throughs					
Total pass-throughs	**81.9**	**81.2**	**80.6**	**79.9**	**323.7**

Note 1: Operating expenditure associated with Sydney Water's BOOT contracts at its water filtration plants has been included in water services rather than bulk water purchases

Note 2: Operating costs exclude ring-fenced recycled water costs, including corporate overheads allocated to recycled water. Totals may not add due to rounding

Note 3: See Table 4.7 for further information for a break-down of cost pass-through expenditure

Note 4: SDP bulk water payment in 2020-21 includes an adjustment of $28.6 million in 2019-20.

Source: IPART analysis

Our draft decisions reflect our assessment of the level of operating expenditure an efficient utility would incur in delivering services to Sydney Water's customers. In making our decision, we considered:

- Sydney Water's operating expenditure over the 2016 determination period.
- The level of operating expenditure Sydney Water forecast over the 2020 determination period.
- Efficiency savings we consider Sydney Water could make over the four years of the 2020 determination period.

We have accepted Atkins' recommendations on adjustments to operating expenditure for specific items and applied an ongoing efficiency factor (0.8% per annum)[11]. As shown in Table 4.2, Sydney Water proposed an $88.9 million efficiency challenge in its November 2019 pricing proposal update. In applying our efficiency factor, we have netted out – effectively replacing – Sydney Water's efficiency challenge with our (similarly sized) efficiency factor. Sydney Water proposed a single efficiency challenge to its operating expenditures only; instead, we consider applying a consistent ongoing efficiency factor to both operating and capital expenditure is more appropriate.

We present detailed analysis of efficiency factors in Appendix F.

Table 4.2 Draft decision compared to Sydney Water's proposed core operating expenditure for the 2020 determination period ($ million, $2019-20)

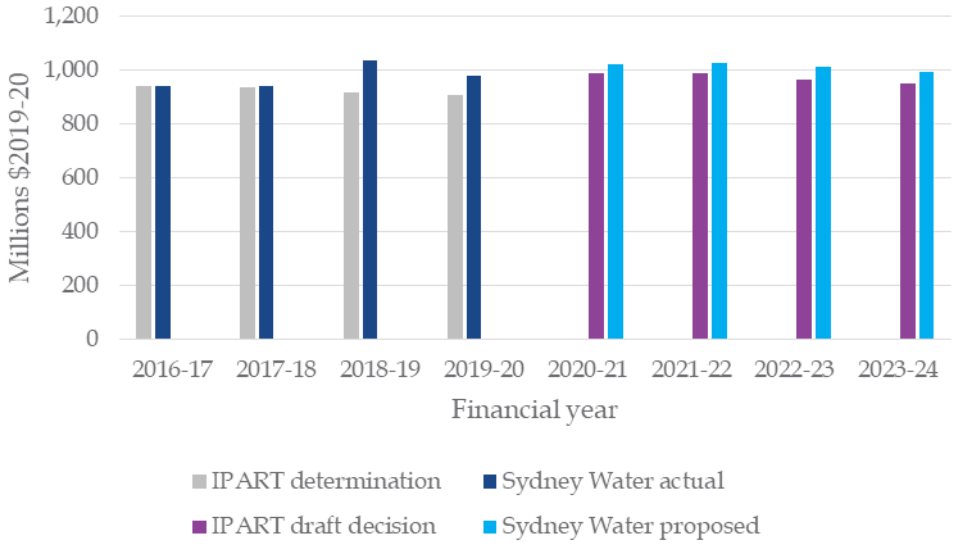
	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's July proposal	**972.3**	**976.4**	**979.5**	**983.3**	**3,911.4**
Sydney Water's additions to proposal (Nov update)					
Additional drought opex, IT forecast update, BOOT plant changes	51.5	65.6	56.3	50.8	224.2
Business wide efficiency challenge (proposed by Sydney Water)	-5.1	-15.7	-26.1	-42.0	-88.9
Sydney Water's Nov update	**1,018.7**	**1,026.3**	**1,009.7**	**992.1**	**4,046.7**
IPART draft decision on adjustments					
Scope adjustments	-28.0	-38.6	-48.6	-49.7	-164.9
Add Sydney Water's proposed business wide efficiency challenge	5.1	15.7	26.1	42.0	88.9
IPART 0.8% continuing efficiency adjustment	-8.1	-16.3	-24.4	-32.6	-81.5
IPART Draft decision	**987.6**	**987.0**	**962.7**	**951.8**	**3,889.2**
Difference	**-31.1**	**-39.2**	**-47.0**	**-40.3**	**-157.6**
Difference (%)	**-3.0%**	**-3.8%**	**-4.7%**	**-4.1%**	**-3.9%**

Source: Sydney Water's update to 1 July Price Proposal, 12 November 2019, Table 2-4, p19; IPART analysis

Figure 4.1 and Table 4.3 compare our draft decisions on Sydney Water's efficient operating expenditure over the 2020 determination period to Sydney Water's proposal. Our draft decision is the same as Atkins' recommended levels of efficient expenditure. It also shows Sydney Water's actual operating expenditure over the 2016 determination period and the level of operating expenditure we used to set prices in 2016. Sydney Water's performance over the 2016 period is summarised in Box 4.2.

11 We have excluded Sydney Water's proposed $88.9 million efficiency challenge and instead applied Atkins' recommended 0.8% efficiency adjustment of $81.5 million.

Figure 4.1 IPART's draft decision compared to Sydney Water's historical and proposed core operating expenditure ($millions, $2019-20)



Note: Year 2019-20 represents Sydney Water's forecast of its operating expenditure. Years 2016-17 to 2018-19 are actuals.
Data source: Sydney Water, Annual Information Return, 12 November 2019; IPART calculations

Table 4.3 Comparison of Sydney Water's operating expenditure over the 2016 and 2020 determination period ($ million, $2019-20)

	2016 determination period		2020 determination period	
	IPART determination	Sydney Water actual	IPART draft decision	Sydney Water proposed
Core opex	3,692.0	3,895.0	3,889.2	4,046.7
Bulk water	1,700.4	1,706.6	1,447.4	1,473.7
Total opex	5,392.4	5,601.6	5,336.6	5,520.5

Note: Sydney Water actual for the 2016 determination period includes forecast for year 2019-20
Source: Sydney Water, Annual Information Return, 12 November 2019; IPART calculations

Box 4.2 Sydney Water's operating expenditure over the 2016 period

Over the 2016 determination period, Sydney Water's total actual operating expenditure was $5,601.6 million. This was $209.3 million (or 3.9%) higher than the expenditure allowance we used to set prices in 2016. This is set out in Table 4.4.

Table 4.4 Sydney Water's operating expenditure over the 2016 determination period ($ million, $2019-20)

	2016-17	2017-18	2018-19	2019-20	Total
Determination	1,359.6	1,354.7	1,341.5	1,336.6	**5,392.4**
Actual/forecast[a]	1,361.6	1,339.0	1,461.1	1,439.9	**5,601.6**
Difference	2.0	-15.7	119.6	103.3	**209.3**
Difference (%)	0.1%	-1.2%	8.9%	7.7%	**3.9%**

a Figure for 2019-20 is a forecast.

Source: Sydney Water, Annual Information Return, 12 November 2019; IPART analysis

The difference between the allowance for operating expenditure in the current determination period and the amount Sydney Water spent helps inform our decision on the efficient level of operating expenditure over the 2020 determination period.

Sydney Water's higher expenditure was in large part driven by:

- Drought conditions - prolonged dry weather and higher than anticipated growth has resulted in greater demand and declining service performance.
- Increased preventative and reactive maintenance works on wastewater and water assets.
- Other cost increases including higher electricity prices, higher-than-expected IT expenditure, costs related to city planning, unanticipated land tax costs.

The higher expenditure was partially offset by savings from BOOT (Build Own Operate and Transfer) water filtration costs and efficiency gains that Sydney Water was able to realise over the period.

4.2 Core operating expenditure for the 2020 determination period

In its November 2019 update to its submission, Sydney Water proposed core operating expenditure of $4,047 million over the four year 2020 determination period. This was $135.4 million higher than its July 2019 proposal, which was based on average weather conditions.

This is shown in Table 4.5 below.

Table 4.5 Draft core operating expenditure ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water proposed	1,018.7	1,026.3	1,009.7	992.1	4,046.7
IPART draft decision	987.6	987.0	962.7	951.8	3,889.2
Difference	-31.1	-39.2	-47.0	-40.3	-157.6
Difference %	-3.0%	-3.8%	-4.7%	-4.1%	-3.9%

Source: Sydney Water, Annual Information Return, 12 November 2019; IPART calculations

We have reduced Sydney Water's core operating expenditure by 3.9%

As part of the expenditure review, Atkins found there is some scope to reduce core operating expenditure below what Sydney Water has proposed. Atkins recommended reducing Sydney Water's proposed operating costs by $157.6 million over the four years, once the efficiency adjustments are netted out. We have accepted Atkins' recommendations.

The reasons for our draft scope adjustments are discussed below.

Table 4.6 Draft adjustments to core opex ($ million, $2019-20)

Draft decision adjustments	2020-21	2021-22	2022-23	2023-24	Total
Prospect Macarthur pipeline	0.00	-10.00	-14.00	-15.00	-39.0
Water reactive - inefficient leakage expenditure	-10.00	-10.00	-10.00	-10.00	-40.0
Wastewater reactive/ environmental program	-7.50	-7.50	-7.50	-7.50	-30.0
BOOT water treatment - volume	-0.24	-0.27	-0.29	-0.31	-1.1
BOOT water treatment - treatment	-3.30	-3.30	0.00	0.00	-6.6
Electricity	0.00	-0.52	-1.86	-1.86	-4.2
City Planning	0.00	0.00	-8.00	-8.00	-16.0
Water conservation	-5.00	-5.00	-5.00	-5.00	-20.0
Infrastructure resilience	-2.00	-2.00	-2.00	-2.00	-8.0
Total scope adjustments	**-28.0**	**-38.6**	**-48.6**	**-49.7**	**-164.9**
Continuing efficiency adjustment	-8.13	-16.35	-24.45	-32.62	-81.5
Add - Sydney Water's proposed efficiency challenge	5.1	15.7	26.1	42.0	88.9
Total adjustments	**-31.1**	**-39.2**	**-47.0**	**-40.3**	**-157.6**

Note: The continuing efficiency adjustment nets off with Sydney Water's proposed $88.9 million

Source: Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, p12; Sydney Water's update to 1 July Price Proposal, 12 November 2019, p19.

Drought resilience project – Prospect Macarthur pipeline

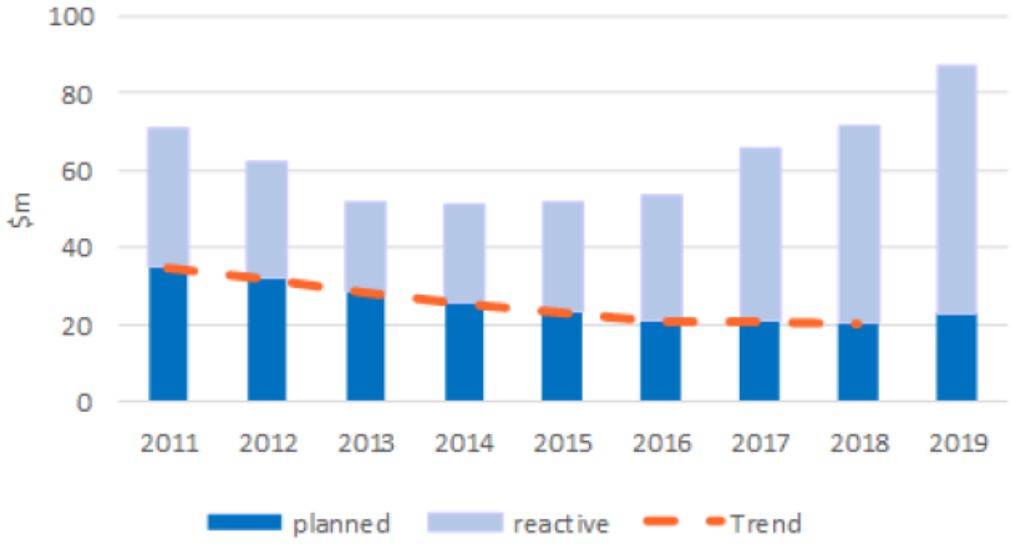
Sydney Water proposed $39.0 million in operating expenditure for the Prospect Macarthur pipeline. We agree with Atkins' revised assessment that, following the recent increase in dam levels in February 2019, it is now prudent to do more thorough planning before proceeding with this project over the 2020 determination period. Therefore, we have reduced operating expenditure to nil (see Chapter 3 and Appendix F for more detail on this project).

Water reactive maintenance

In its November update, Sydney Water proposed an additional $98 million over the four year period for 'reactive' maintenance to repair leaks.[12] The increased water maintenance expenditure by Sydney Water is to repair leaks and return leakage to its economic level.

Atkins found that Sydney Water's increased reactive maintenance is partly due to previous inefficient leakage management over the 2016 determination period. In particular, it found that Sydney Water's spending on planned, or proactive, maintenance fell over the 2012 and 2016 determination periods, and that this reduction is likely to have impacted of the extent of reactive maintenance needed over the 2020 period (see Figure 4.2). That is, "the increase in reactive maintenance could have been reduced through a continued level of planned maintenance through the 2012 and 2016 Determination periods".[13]

Figure 4.2 Sydney Water's expenditure on planned and reactive maintenance for its water network



Data source: Sydney Water document 265.1; Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p118

Furthermore, Atkins considered that Sydney Water was not able to respond to increasing leakage as it didn't have flow monitoring and leakage detection systems, which resulted in delays in locating leakage at an early stage – resulting in total leakage well above the economic level.

> Sydney Water was not able to respond to increasing leakage because it did not have the flow monitoring and leakage detection systems that most other frontier companies normally use. This results in delays in locating leakage at an early stage [and]…resulted in total leakage being well above the economic level.[14]

12 Proactive maintenance is expenditure that focuses on anticipating and managing failures as they occur, whereas reactive maintenance is expenditure that focuses on repairing, or replacing equipment after its performance has failed.

13 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water; p118.

14 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 157

Atkins concluded that the reactive leakage activity is required to return leakage to its mean economic level as soon as practical. However, it found that the water lost from the system above the economic level of leakage reflects inefficiency in Sydney Water's operations, which should not be recovered from prices in the 2020 determination period.

Importantly, we do not question the work that should be completed by Sydney Water in terms of reactive maintenance to reduce leakage. In fact, we consider it vital that Sydney Water reduces its level of leakage to the economic level. However, we agree with Atkins' recommendation that customers in the 2020 determination period should not be paying for inefficient maintenance decisions taken by Sydney Water over the 2016 determination period.

Our draft decision is to reduce operating expenditure by $40 million to reflect the value of water lost to an inefficiently high level of leakage.

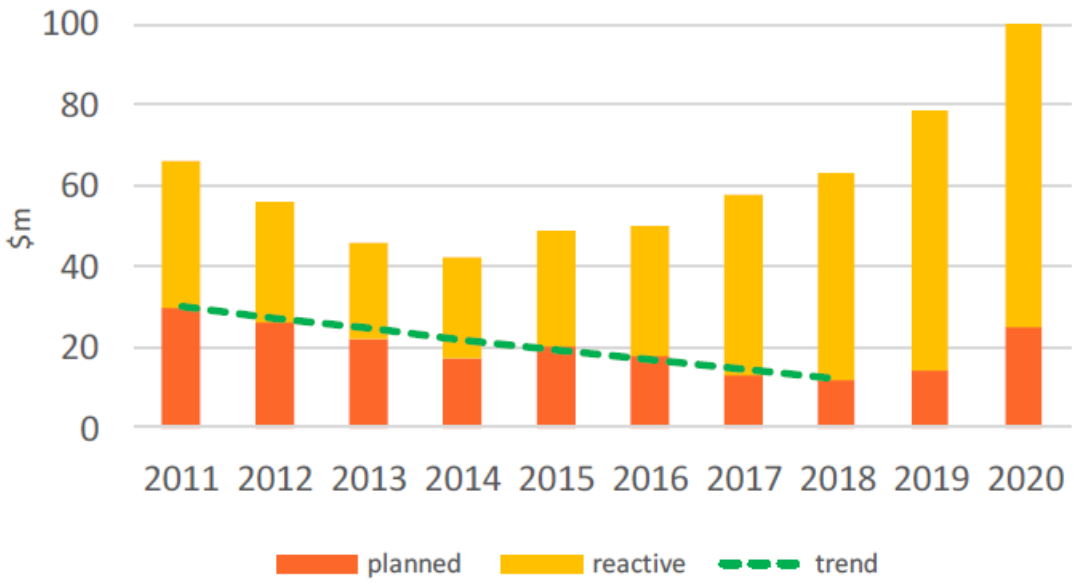
Further information on Sydney Water's performance on leakage can be found in Chapter 13.

Wastewater reactive maintenance

Sydney Water has proposed $273.2 million over the four year period on 'reactive' maintenance of its wastewater network (an increase of about $60 million from the 2016 period). This is to reduce dry weather wastewater overflows by repairing chokes and blockages in its wastewater pipes, often caused by tree roots. Sydney Water states this amount is required to meet minimum requirement in its Environment Protection Licences, and an increase is partly required due to dry weather conditions in recent years.

As with Sydney Water's water network maintenance, Atkins found that Sydney Water has reduced its spending on planned, or proactive, maintenance for its wastewater pipes over the 2012 and 2016 determination periods (see Figure 4.3).

Figure 4.3 Sydney Water's expenditure on planned and reactive maintenance for its wastewater network



Data source: Sydney Water document 265.1; Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p119

Atkins' view is that some of the increase in reactive expenditure could have been avoided by more effective asset management and greater proactive maintenance (eg, CCTV inspections) during the 2016 determination period. Atkins notes that, as with water reactive maintenance, customers should not be paying for inefficient maintenance decisions taken by Sydney Water over the 2016 period.

We do not question the importance of this work, and agree that this expenditure needs to be done to meet environmental obligations and community expectations. However, we also agree with Atkins' view that customers should not be paying for asset maintenance expenditure to address previously inefficient decisions taken by the business.

We have therefore reduced Sydney Water's operating expenditure allowance by $30 million.

Other minor adjustments

BOOT water treatment – water quality and volume

Sydney Water has Build Own Operate and Transfer (BOOT) agreements for water filtration services at its four largest water filtration plants (WFPs) – Prospect, Woronora, Illawarra and Macarthur. Sydney Water has proposed $407 million over the four year period on water treatment costs at these plants, an increase of $21 million (or 5.4%) from what we set for the 2016 determination period.

Sydney Water's rationale for this additional expenditure is that it anticipates lower water quality in the next period, requiring higher treatment costs.

Atkins' found that Sydney Water took a low risk approach in estimating future costs, which will likely overstate the increase in treatment works costs required. Atkins' view is this risk should be shared between Sydney Water and its customers.

We agree with Atkins' reasoning, and have therefore reduced our operating expenditure allowance by $7.7 million.

Electricity

Sydney Water has proposed $158.4 million in electricity costs over the four year 2020 determination period. According to Sydney Water, its forecast electricity expenditure incorporates a portfolio-wide optimisation of energy costs, including where renewable energy is an efficient investment.

Atkins found that Sydney Water did not achieve its renewables target over the 2016 determination period, and the target that Sydney Water has set for the 2020 determination period only catches up to what was meant to be achieved by year 2020 and not beyond.[15]

In particular, previous research suggests wastewater treatment plants in Australia are generally less energy efficient compared to European (particularly German) plants.[16] As

15 For the 2020 determination period, Sydney Water is proposing to add a further 10 GWh renewables by 2024 which achieves the target it was set for 2020 and not beyond. Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p121.

16 See, for example: D. De Hass, et al (2018), 'Benchmarking energy use for wastewater treatment plants', Water e-Journal Vol 3 No 1; and D. De Hass, et al. (2015), 'Benchmarking wastewater treatment plant energy use in Australia', findings presented at the 2015 Ozwater Conference.

technology improves in wastewater treatment plants, there may be more opportunities to improve energy efficiency, for example, through co-generation.

We have accepted Atkins' recommendation of a phased stretched renewables target of 2% of grid supplies by 2024 and have accordingly reduced Sydney Water's operating expenditure allowance by $4.2 million. We agree with Atkins that this is a modest adjustment. We would be keen to understand more from Sydney Water on what it is doing to lift its energy efficiency.

City planning

Sydney Water proposed $32 million over the four year period to support the Department of Planning, Industry and the Environment (DPIE) in strategic management and planning for the Western Parkway City.

Atkins considered it reasonable for this support to carry for the first two years of the determination period, however, the city planning work may transition into a separate planning authority. Consequently, Atkins recommended not extending this additional expenditure past 2021-22.

We agree with Atkins' rationale, and have reduced our operating expenditure allowance by $16 million.

Water conservation - advertising

Sydney Water has proposed $40 million – of base operating expenditure – on advertising to promote water conservation. We have reduced this by $20 million in the baseline operating expenditure allowance, as the advertising costs of water conservation are primarily driven by drought conditions. Instead, we have included the remaining $20 million as a cost pass through, which is triggered when dam levels fall below 60% (see cost pass through section below).

Infrastructure resilience

Sydney Water has proposed $8 million over the four year period to undertake additional investigations into the resilience of its infrastructure in response to drought conditions. No information from Sydney Water was provided to support the proposal.

We have reduced Sydney Water's operating expenditure allowance by $8 million as we agree with Atkins' view that this a business-as-usual activity that should already be recovered as part of Sydney Water's existing base operating expenditure.

Environmental licensing requirements

Atkins found that the most likely future material changes to Sydney Water's Environment Protection Licences (EPL) at the next IPART price review will be the EPA's proposed Hawkesbury Nepean Offset Scheme (HNOS) and the introduction of bubble licensing to the Hawkesbury-Nepean River to manage nitrogen loads and improve the health of the waterway.

Bubble licensing will enable polluters, including Sydney Water, to pursue a range of measures to contain nutrient loads such as increased treatment, recycling, and the trading credits for pollution abatement, so that lowest cost abatements can be promoted.[17]

Sydney Water proposed operating expenditure of $13 million on research and development to prepare for the EPA's proposed HNOS.[18] Work in quantifying the cost implications of the HNOS are only preliminary at this stage.

Atkins have confirmed that Sydney Water has commenced planning for the introduction of this licensing approach and has accepted Sydney Water's proposed costs.

Our draft decision is to accept Sydney Water's proposed expenditure, consistent with Atkins' recommendation.

4.3 Bulk water costs

Sydney Water purchases most of the bulk water it needs to supply its customers from WaterNSW. It also purchases bulk water from the SDP when this plant is operating, and pays a fixed charge when the SDP is in water security shut down mode. Therefore, its bulk water costs depend on a range of factors, including:

- The volume of water it needs to purchase to meet its customers' demand
- WaterNSW's and SDP's prices, which are regulated by IPART, and
- SDP's mode of operation, which is governed by the operating rules set out in the Metropolitan Water Plan.

Our draft decision on Sydney Water's bulk water costs is shown in Table 4.7 below. The difference between our draft decision and Sydney Water's forecast is from our draft decision on WaterNSW's bulk water prices, which is based on our assessment on the efficient level of WaterNSW's expenditure, found in our Draft Report on our parallel WaterNSW pricing review.

17 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 266.

18 Further detail on the EPA's proposed HNOS and its purpose can be found on pages 66 - 68 of our Issues Paper: IPART, *Review of prices for Sydney Water Corporation services from 1 July 2020* – Issues Paper, September 2019, pp 66-68.

Table 4.7 Draft decision on Sydney Water's bulk water costs ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposed					
WaterNSW	189.2	193.7	199.6	202.8	785.3
SDP	152.0	178.8	178.8	178.8	688.5
Total	341.2	372.5	378.4	381.6	1,473.7
IPART draft decision					
WaterNSW	189.1	189.5	189.9	190.5	759.0
SDP	152.0	178.8	178.8	178.8	688.5
Total	341.1	368.3	368.7	369.3	1,447.4
Difference	**-0.1**	**-4.2**	**-9.6**	**-12.3**	**-26.3**
Difference %	-0.03%	-1.13%	-2.55%	-3.23%	-1.78%

Note: SDP bulk water payment in 2020-21 includes an adjustment of $28.6 million in 2019-20.

Source: Sydney Water, Pricing Proposal 2020-24, July 2019; and IPART calculations

Our base expenditure allowance for SDP costs assumes that SDP is not operational, and does not include any costs if a Government decision is made to expand SDP.

As discussed in Chapter 6, our draft decision is to include an uplift to the water usage price in drought conditions, to recover the forecast costs of operating SDP. And, to the extent that SDP's actual operating costs are different to our forecasts, these would be recovered from our existing cost pass-through formula.[19] This cost pass-through would also recover any capital costs that Sydney Water is asked to pay SDP over the 2020 determination period, if a Government decisions is made to expand SDP.

4.4 Cost pass-through operating expenditure

In its November 2019 update to its pricing proposal, Sydney Water proposed an additional $347.8 million in operating expenditure via cost pass-throughs, which would be recovered from prices if drought conditions persist. These cost pass-throughs would be triggered at various dam levels below 60%.

In this section we outline our draft decision on the efficient level of cost pass-through operating expenditure, while Chapter 6 outlines how these costs would be recovered from customers in drought conditions.

Atkins assessed Sydney Water's proposed expenditure. Atkins recommended:

- A small reduction to Sydney Water's water conservation expenditure from 2021-22. Atkins found that the costs and benefits of Sydney Water's additional water conservation activities, beyond the expenditure level in the first year of the determination, were not robust.

19 The SDP cost pass-through mechanism would adjust Sydney Water's water service price annually if SDP's charges to Sydney Water vary during the determination. If the Government decided to expand SDP during the 2020 determination period, Sydney Water may face higher charges from SDP. The existing cost pass through mechanism would pass through these costs into Sydney Water's water service charges to its customers.

- Reallocating $20 million of water restriction advertising as a cost pass-through (as explained above).
- Applying a 0.8% efficiency adjustment.

We have agreed with Atkins' recommendations. Our draft decision is to set the operating expenditure for cost pass through as shown in Table 4.8 below. As discussed in Chapter 6, the trigger for the expenditure in Table 4.8 to be passed through to prices is dam levels falling below 60%.

Table 4.8 Draft decision on cost pass through for operating expenditure ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposal (Nov 2019)	77.6	90.1	90.1	90.1	347.8
IPART adjustments					-
SDP network expansion	-	*-0.5*	*-0.5*	*-0.5*	*-1.5*
Water conservation	-	*-12.0*	*-12.0*	*-12.0*	*-36.0*
Water restrictions advertising	*5.0*	*5.0*	*5.0*	*5.0*	*20.0*
Efficiency adjustment	*-0.7*	*-1.3*	*-2.0*	*-2.6*	*-6.6*
Total adjustment	4.3	-8.8	-9.5	-10.1	-24.1
IPART draft decision on cost pass through	**81.9**	**81.2**	**80.6**	**79.9**	**323.7**

Note: Totals may not add due to rounding
Source: Sydney Water, Annual Information Return, 12 November 2019; IPART calculations

Atkins also recommended a $53 million reduction in cost pass-through operating expenditure to reflect reduced treatment costs at the Prospect Water Treatment Plant when SDP is operational. Our existing SDP cost pass-through formula automatically accounts for this reduction in water treatment costs, and our draft decision is to reflect these avoided costs using the existing cost pass-through formula.[20]

As discussed in Chapter 6, we have re-allocated Sydney Water's proposed $1.5 million of operating expenditure for the SDP network expansion to a separate cost pass-through, which recovers Sydney Water's network expansion costs. This is because the trigger for this expenditure is a Government decision to expand SDP, rather than dam levels falling below a certain level.

20 Officers at Sydney Water have agreed that the cost pass-through formula should account for the reduction in water treatment costs when SDP is operational, and have provided updated estimates of variable treatment costs to IPART.

5 Notional revenue requirement

To set prices, we first determine the efficient costs that Sydney Water would require to deliver its services. This chapter presents our approach and decisions on the notional revenue requirement (NRR), which is the sum of the efficient costs of providing Sydney Water's regulated services in each year of the determination period. We then set water, wastewater and stormwater prices to recover this amount of revenue.

As discussed in Chapter 3, we have made a draft decision to include additional drought costs, as a cost pass-through. Therefore, we have prepared an NRR that would apply in average weather conditions, and an NRR for drought conditions which includes the efficient operating expenditure that Sydney Water would incur in drought. Chapter 6 explains how the drought NRR would be reflected in our proposed uplift to the water usage price.

5.1 How do we assess the notional revenue requirement?

We used the 'building block' approach to calculate the NRR. In this approach, we break down Sydney Water's costs into five components (or building blocks), namely the:

- **Operating cost allowance,** to cover costs such as maintenance and administration costs.
- **Capital cost allowance**, comprised of:
  - **return on** the assets that Sydney Water uses to provide its services
  - **regulatory depreciation** (or a **return of** the assets that Sydney Water uses to provide its services), which involves deciding on the appropriate asset lives and depreciation method.
- **Tax allowance**, which approximates the tax liability for a comparable commercial business.
- **Working capital allowance,** which represents the holding cost of net current assets.

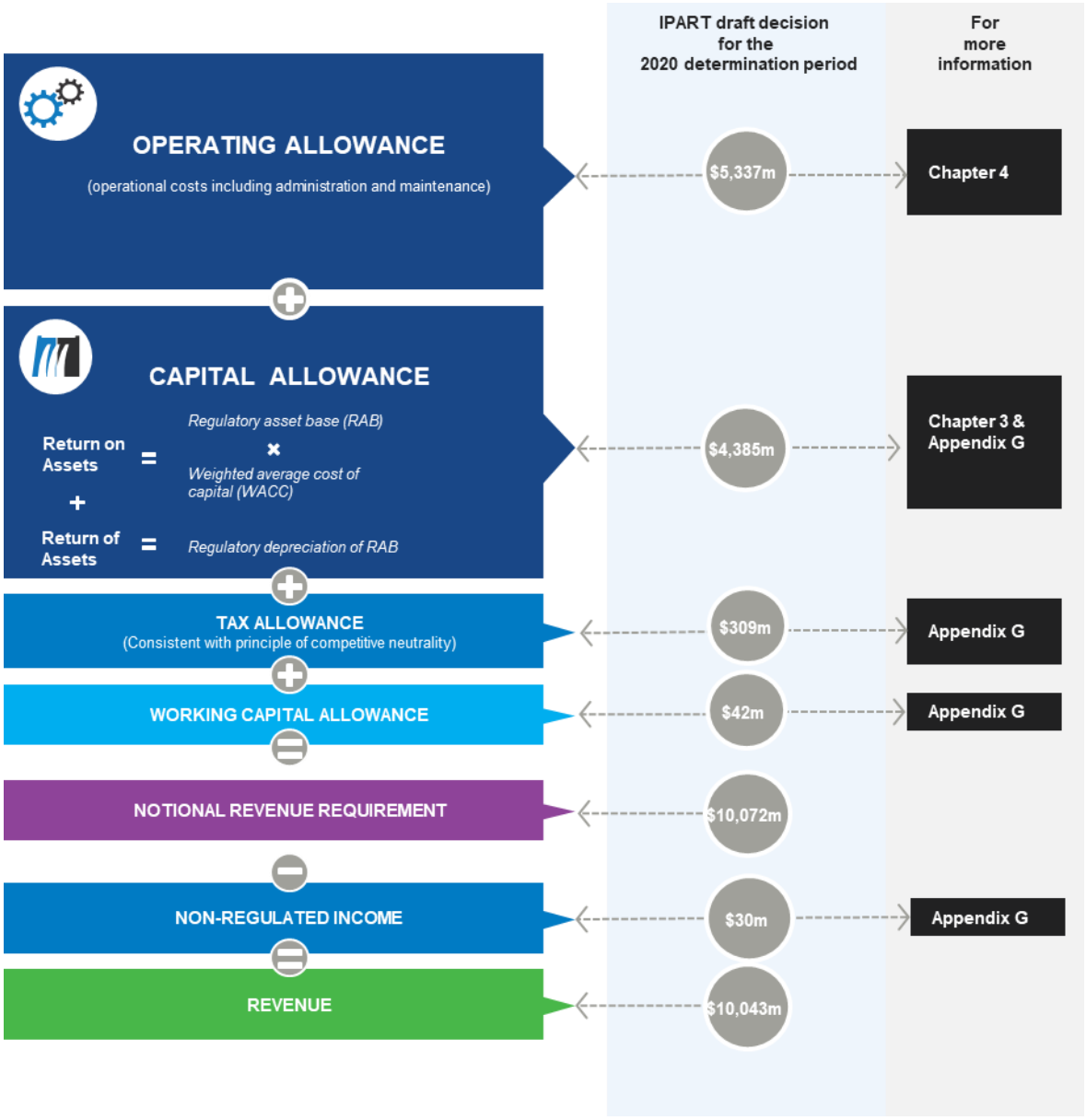
The annual sum of these building block items is the NRR, and represents our assessment of the total efficient costs Sydney Water should incur in delivering its services. Once we calculated Sydney Water's NRR, we took account of any adjustments to accommodate revenue that Sydney Water will receive from other sources.

We have set an NRR that would apply in average conditions, and a separate NRR that would apply in drought conditions.

We then decided on the approach we would use to allow Sydney Water to recover the NRR via its prices. This involved setting the **target NRR** for each year – that is, the actual revenue we expect Sydney Water to generate from prices for that year. We smoothed the revenue requirement across the determination period to make prices constant in real terms over the four years. In making this decision on target revenue, we consider a range of factors, including implications on price levels, the rate they would change, and any impacts on Sydney Water and its customers.

Figure 5.1 illustrates our approach to calculating the NRR and how we set prices.

Figure 5.1 The building block model



Note: Numbers may not add due to rounding.
Source: IPART analysis

A full discussion of our approach to calculating the NRR and how we set prices is set out in Appendix G.

5.2 Our draft NRR for the 2020 period

We made draft decisions:

7 To set the "average weather" Notional Revenue Requirement (NRR) of $10.1 billion as shown in Table 5.1.

8 To set the "drought" NRR of $10.7 billion as shown in Table 5.2.

The draft NRR in average weather conditions is $10.1 billion over four years, as set out in Table 5.1. This is $630.5 million (5.9%) less than Sydney Water's proposal over the four years of the 2020 determination period. We present our decisions related to each of the building blocks in the table below. Further information is presented in Appendix G.

Table 5.1 Draft decision on "average weather" NRR and comparison to Sydney Water's proposal ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Operating expenditure	1,328.7	1,355.4	1,331.4	1,321.1	5,336.6
Return on assets	619.0	642.1	662.7	679.8	2,603.6
Depreciation	402.3	434.4	462.6	481.2	1,780.5
Tax allowance	85.3	68.2	73.1	83.1	309.7
Return on working capital	9.3	10.3	10.8	11.4	41.8
Total NRR	**2,444.5**	**2,510.5**	**2,540.7**	**2,576.6**	**10,072.2**
Sydney Water's proposal	2,559.6	2,661.1	2,713.2	2,768.6	10,702.5
Difference ($)	(115.1)	(150.7)	(172.6)	(192.1)	(630.5)
Difference (%)	(4.5)	(5.7)	(6.4)	(6.9)	(5.9)

Note: Totals may not add due to rounding. The notional revenue requirement is our assessment of the efficient economic costs of delivering services. Before setting prices, we make other adjustments such as subtracting a share of non-regulated income.

Source: Sydney Water update to 1 July Price Proposal, 12 November 2019, p 60; IPART calculations

In drought, the NRR would rise to $10.7 billion, as shown in Table 5.2.[21] Chapter 6 explains how this increase would be reflected as an uplift to the water usage price.

Table 5.2 Draft decision on "drought" NRR and comparison to Sydney Water's proposal ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Operating expenditure	1,470.7	1,495.7	1,471.1	1,460.2	5,897.7
Return on assets	619.0	642.1	662.7	679.8	2,603.6
Depreciation	402.3	434.4	462.6	481.2	1,780.5
Tax allowance	85.4	68.4	73.2	83.3	310.3
Return on working capital	10.2	11.3	11.7	12.3	45.5
Total NRR	**2,587.6**	**2,651.8**	**2,681.4**	**2,716.8**	**10,637.6**
Sydney Water's proposal	2,723.1	2,826.0	2,880.0	2,936.1	11,365.2
Difference ($)	(135.5)	(174.2)	(198.6)	(219.3)	(727.6)
Difference (%)	(5.0)	(6.2)	(6.9)	(7.5)	(6.4)

Note: Totals may not add due to rounding. The notional revenue requirement is our assessment of the efficient economic costs of delivering services. Before setting prices, we make other adjustments such as subtracting a share of non-regulated income.

Source: Sydney Water update to 1 July Price Proposal, 12 November 2019, p 60 & 67; IPART calculations

As at March 2020, dam levels are around 80% and the NRR for normal weather conditions would apply. In the following sections, unless specified as "drought NRR", we compare the

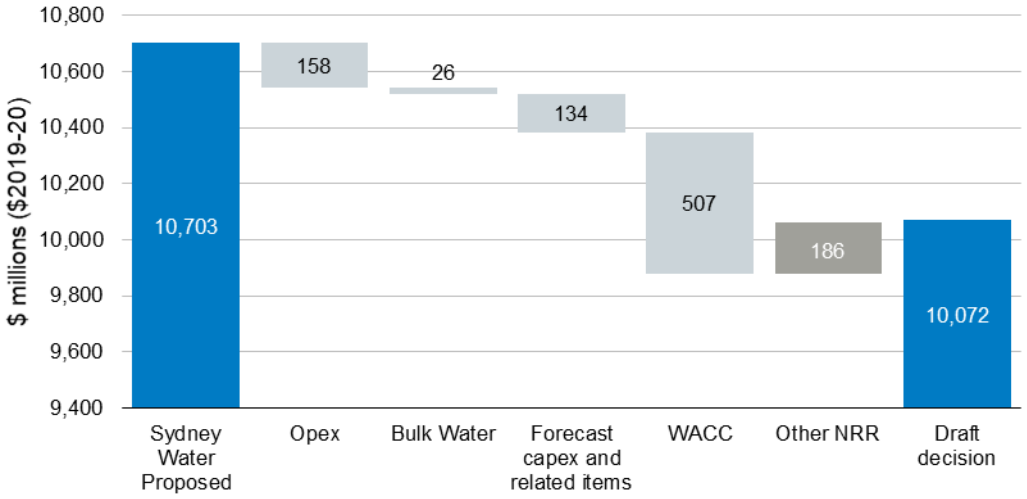
21 The increase in the NRR largely reflects an increase in operating expenditure, due to Sydney Water's proposed drought cost pass-throughs which we have accepted, and additional bulk water costs incurred by Sydney Water from the operation of SDP and forecast Shoalhaven pumping costs.

"average weather" NRR against the NRR used to set prices in the 2016 determination and that in Sydney Water's proposal.

5.3 Our draft NRR is lower than proposed by Sydney Water

Compared to Sydney Water's proposal, our draft NRR is $630.3 million, or 5.9%, lower over the four years of the 2020 determination period. Figure 5.2 shows that a reduction in interest rates (ie, the WACC) has had the largest impact on the NRR. This is largely a function of timing; while Sydney Water's proposal used the same methodology to set the WACC as IPART, between when Sydney Water submitted its proposal and now, interest rates have fallen and the WACC is now 3.2%. That is, if Sydney Water submitted its pricing proposal now, its proposed NRR would be significantly closer to our draft NRR.

Figure 5.2 The key decisions in changes from Sydney Water's proposed NRR to our draft NRR



Note: The NRRs shown are before adjustments for non-regulated revenue, miscellaneous revenue, trade waste revenue and DVAM. Other NRR includes changes in working capital, tax depreciation and asset lives.
Source: IPART calculations

Compared to the NRR we set in the 2016 determination, our total draft NRR (before adjustments) is $378 million (or 3.6%) lower than we used to set prices in 2016 over 4 years.[22] It reflects:

- A similar allowance for operating costs, reflecting a modest reduction to Sydney Water's proposed costs (-0.4%).
- A lower WACC, resulting in a large decrease (-25.4%) in return on assets, offset by an increase in the depreciation allowance as a result of a larger RAB due to inflation and capital expenditure.

22 Further, typical bills using the draft prices will be lower than in 2019-20 (in real terms). This is due to an increase in customer numbers, essentially sharing the costs amongst more customers.

5.4 We adjusted the NRR to account for revenue that Sydney Water will receive based on other decisions we have made

Before setting prices to recover the NRR, we subtract revenue that Sydney Water is forecast to receive from other sources. This ensures that the utility does not over-recover that efficient level of expenditure, and that customers do not pay too much. These other sources include:

- **The demand volatility adjustment mechanism (DVAM).** This mechanism seeks to ensure there is a reasonable match between Sydney Water's revenue requirement and its revenue from water sales. We would consider applying a demand volatility adjustment when actual water sales, over the previous determination period, differ from the forecast sales that we used to set prices by more than +/-5%. This review is the first time we have applied a DVAM: our draft decision is to return $20.1 million to customers over the 2020 determination period, to account for higher than forecast water sales over the 2016 determination period. This is explained in more detail in Chapter 6 and Appendix J.
- **Trade waste services, miscellaneous services, raw water and bulk water services**. These are used by small subsets of customers, and they are priced separately to the water, wastewater and stormwater services. Chapter 11 provides our detailed assessment of the prices for these services.
- **A share of revenue from non-regulated sources,** when made using regulated assets. This acknowledges that the customers have paid for the asset, and should therefore share in some of the unregulated revenue Sydney Water has earnt from regulated assets. Appendix G explain how we have treated non-regulated revenue from various sources.

We made draft decisions:

9 For non-regulated revenue, in accordance with Table 5.3:

- To allow Sydney Water to retain the revenue from recycled water schemes where the water displaces some potable water sales, as compensation for lost potable water sales.
- To share with customers 10% of the revenue from the sale of biobanking credits.
- To share with customers 50% of other non-regulated revenue from rentals and recycled water schemes where the water does not displace potable water sales.

10 To subtract, from the NRR, the revenue from our decisions on the demand volatility adjustment mechanism, trade waste services, miscellaneous services, non-regulated assets, and raw water and bulk water services, as set out in Table 5.4.

Table 5.3 Non-regulated revenue to be removed from the NRR ($ million, $2019-20)

Revenue source	2020-21	2021-22	2022-23	2023-24	Total
Biobanking	1.0	0.4	0.2	0.5	2.1
Recycled water	2.2	2.2	2.2	2.2	8.8
Other, including rentals	5.0	4.7	4.5	4.4	18.6
Total	**8.2**	**7.3**	**6.8**	**7.1**	**29.5**

Note: This is revenue from s16A recycled water schemes and includes the additional $50,000pa to Sydney Water to reflect 50% share of the revenue from its least cost recycled water schemes (see Chapter 10).

Source: IPART calculations

Table 5.4 presents our draft decisions on adjustments to the NRR.

Table 5.4 Draft adjustments to the NRR ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
IPART decision NRR from building blocks	**2,444.5**	**2,510.5**	**2,540.7**	**2,576.6**	**10,072.2**
Demand volatility adjustment	20.1	0.0	0.0	0.0	20.1
Trade waste revenue	24.7	25.0	25.3	25.6	100.7
Miscellaneous charges	12.3	12.4	12.6	12.7	50.0
Non-regulated revenue	8.2	7.3	6.8	7.1	29.5
Total adjustments	**65.3**	**44.8**	**44.7**	**45.4**	**200.2**
IPART draft decision: Revenue to be recovered by water, wastewater and stormwater prices	**2,379.2**	**2,465.6**	**2,495.9**	**2,531.2**	**9,872.0**
Sydney Water's proposal: revenue to be recovered by water, wastewater and stormwater prices	2,570.6	2,609.4	2,647.5	2,692.2	10,519.7
Difference ($)	(191.4)	(143.8)	(151.6)	(161.0)	(647.7)
Difference (%)	(7.4)	(5.5)	(5.7)	(6.0)	(6.2)

Note: Totals may not add due to rounding.

Source: Sydney Water update to 1 July Price Proposal, 12 November 2019; IPART analysis

5.5 We smoothed the revenue requirement before setting prices

We made a draft decision:

11 To set prices to recover the total NRR over four years, in present value terms.

Our draft decision is to set prices to recover the adjusted NRR by the end of the determination period, rather than to recover the annual NRR by the end of each year of this period. This is in line with our usual practice. With this approach we set prices over the 4-year determination period so that the present value of the target revenue equals the present value of the NRR (see Table 5.5). That is, the price path is NPV neutral, even though the target revenue to be recovered in each year of the period will not exactly equal the NRR in each year. This approach smooths the impact of price changes over the period, thus reducing price volatility for customers, and revenue volatility for Sydney Water.

Table 5.5 Comparison of NRR and smoothed target revenue ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	4-year NPV[a]
Adjusted NRR	2,379.2	2,465.6	2,495.9	2,531.2	9,127.1
Target revenue from prices	2,412.2	2,449.1	2,484.9	2,523.5	9,127.1
Difference	33.0	(16.6)	(11.0)	(7.7)	0.0

[a] Sum over the four years on a present value basis, assuming a discount rate equal to the real pre-tax WACC (3.2%).

To set prices for each service, we calculate a separate NRR for water, wastewater and stormwater services, to ensure customers who do not have access to one or more of the

services do not pay for them.[23] Each of these NRRs are based on the cost build-up for the individual service, with an allocation of corporate costs.

5.6 Summary of our building block decisions

Our draft decision on Sydney Water's operating expenditure allowance is provided and explained in Chapter 4. In relation to the remaining building blocks, our draft decisions are summarised below and discussed in more detail in Appendix G.

We made draft decisions:

12 To calculate the tax allowance using:

- A tax rate of 30%
- Sydney Water's forecast of assets free of charge, and
- Sydney Water's forecast tax depreciation, adjusted for our decisions on capital expenditure.

13 To calculate the return on assets using a WACC of 3.2% and RAB values shown in Table G.1 and Table G.2 in Appendix G.

14 To apply a true-up of annual WACC adjustments at the next Determination.

15 To calculate the working capital allowance as set out in Table G.13 in Appendix G.

23 The adjustments are allocated depending on the infrastructure that is used to derive the revenue. The DVAM adjustment is taken from the water NRR because the over recovery is from water usage.

6 Water prices that respond to drought

Sydney Water currently recovers about 80% of its costs of supplying water through a water usage charge based on a customer's per kilolitre (kL) consumption. It recovers the remaining 20% from fixed service charges. The water usage charge does not currently vary with drought.

In this chapter we discuss our draft decision to introduce a more dynamic water usage price.

In "normal", or non-drought, periods, the water usage price would be $2.30/kL. This is slightly higher than the current water usage price of $2.11/kL, and is based on updated estimates of the long-run cost of providing water in normal conditions.

The water usage price would be higher - $3.12 per kilolitre – when dam storage levels fall below 60% - to recover Sydney Water's increased costs during drought.

We consider that setting a higher usage charge during drought is the most equitable and efficient way to recover the costs of drought, and provides a strong incentive for customers to respond to drought by reducing their consumption, without locking in higher prices when not in drought.

At the same time, we have reduced the fixed service charge by 78%, which ensures that bills remain cost-reflective and affordable for customers.

This chapter then presents our draft decisions on how Sydney Water's cost and revenue risks are shared between Sydney Water and its customers.

6.1 Dynamic water usage prices

We made draft decisions:

16 To set two water usage prices and water sales forecasts based on:

- normal water storage conditions, and
- a drought scenario.

17 To adopt the water sales forecasts in Table 6.2 to set the base and drought water usage prices.

18 To set the base water usage price at $2.30/kL (in $2019-20) and hold the price constant over the 2020 determination period (excluding inflation).

19 To set the drought water usage price at $3.12/kL (in $2019-20) and hold the price constant over the 2020 determination period (excluding inflation).

20 That the drought water usage price would commence when dam storage levels fall below 60% and remain in place until storage levels reach 70%.

21 To update the water usage price on a quarterly basis based on the final WaterNSW weekly water storage report of the previous quarter.

22 To remove the current $0.13/kL uplift to the water usage charge if SDP is operating, as the costs of operating SDP would be recovered through the drought water usage price.

23 To accept Sydney Water's revised forecasts of customer numbers, and set Sydney Water's maximum water service charges as shown in Table 6.1.

Table 6.1 summarises our draft water usage and service charges, and Table 6.2 summarises the water sales forecasts and customer numbers assumed in our forecasts.

Table 6.1 IPART draft water prices ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Service prices ($/year)					
Residential customer	96.69	21.22	21.22	21.22	21.22
Non-residential customer with 20mm meter[a]	96.69	21.22	21.22	21.22	21.22
Usage prices ($/kL)					
Base scenario	2.11	2.30	2.30	2.30	2.30
Drought scenario	N/A	3.12	3.12	3.12	3.12

a Non-residential service charges for larger water meter sizes are calculated as: (meter size in mm)^{2}x(20 mm meter price)/400.

Table 6.2 IPART draft water sales and customer numbers

	2019-20	2020-21	2021-22	2022-23	2023-24
Customer numbers (000s)					
Residential	1,906	1,943	1,981	2,017	2,052
Non-residential	105	106	107	109	110
Water Sales (ML)					
Base scenario	510,738	508,539	515,195	521,474	529,329
Drought scenario	N/A	422,787	428,321	433,541	440,071

Note: Includes unfiltered and unmetered water sales.

Source: Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, Tables 4-8 and 4-9; IPART analysis.

6.1.1 Our previous water pricing approach did not adequately account for water restrictions

Previously, we have set a single water usage price with reference to the Long Run Marginal Cost (LRMC) of supplying water, assuming average weather and water consumption.

Under normal rainfall conditions actual water sales are typically within 5% of our forecasts,[24] which only has a minor impact on Sydney Water's overall revenue. To address larger forecasting errors, we included a demand volatility adjustment mechanism to offset any over-recovery or under-recovery of Sydney Water's efficient costs in the following determination period.

24 There is a demand volatility adjustment mechanism in place that is activated if sales fall outside of the 5% forecast set by IPART. This mechanism has not been activated in the past.

However, this approach has a number of limitations in periods of water restrictions during drought. Water restrictions in Sydney can last several years and have in the past reduced demand by up to 17%.[25] This results in large reductions in revenue for Sydney Water, while at the same time its costs will typically be increasing to manage drought. This can create cash flow issues for Sydney Water, and provide a less cost reflective signal to customers.

6.1.2 Sydney Water's proposed approach would not encourage water conservation during drought, and could increase uncertainty for customers

In its November 2019 pricing proposal update, Sydney Water identified:

- Additional costs it will face if water storage levels are low during the 2020 determination period, of up to about $150m a year or 6% of Sydney Water's annual revenue. It proposed recovering its drought expenditure through a series of cost pass-throughs, which would increase the fixed water service charge for customers by between $44 and $58 a year.
- That water restrictions could have a significant impact on its water sales, which would lead to an under recovery of efficient costs. It proposed a Drought Volatility Adjustment Mechanism (DVAM) to recover a reduction in revenue from water sales being below "normal" water sales during a drought period, by increasing the fixed water service charge in the next financial year.

We have not accepted Sydney Water's proposal to increase water service charges for the costs of responding to drought. We consider Sydney Water's proposal:

- Could lead to large increases in service prices depending on which pass-throughs were triggered at any particular time, creating the risk of bill shock for customers.
- Would not provide a strong incentive for customers to conserve water during drought.
- Would shift almost all the cost and revenue risks in responding to drought from Sydney Water to its customers.
- Is not consistent with stakeholder preferences for costs to be predominantly recovered from water usage prices (rather than service prices).

6.1.3 Stakeholders had a variety of views on how to set water usage prices

Sydney Water's customer engagement survey found the majority of customers supported either maintaining the current split of around 80% usage charges and 20% service charges or further increasing the usage charge somewhat.[26] This result is similar to surveys by Victorian water businesses[27] and to a lesser extent by Hunter Water.[28]

Stakeholders proposed a number of alternative approaches to setting water prices. We discuss these suggestions as well as other approaches to setting water prices in Appendix I. In summary:

25 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 94.
26 Sydney Water pricing submission to IPART, July 2019, Appendix, 3D p 27.
27 City West Water, *Customer Outcomes Proposal*, October 2018, p 28. South East Water, *2018 Price Submission*, October 2017 p 82.
28 Hunter Water pricing submission to IPART, July 2019, Technical Paper 1, p 13.

- The Public Interest Advocacy Centre (PIAC) advocated for an Inclining Block Tariff (IBT).[29] It considered that an IBT would accurately reflect the risk of water scarcity and would respond to customer preferences that pricing should be weighted towards a volumetric usage charge which provides households with the ability to reduce their bills by managing usage.[30]
- Urban Water Cycle Solutions suggested a new pricing model combining all water and sewerage usage and service charges into a single volumetric water tariff which varies by the distance water and sewage are transported.

At the November public hearing:

- PIAC stated its strong preference to add additional drought costs to the usage charge, rather than the service charge, to ensure customers retain the ability to control their bill as much as possible.[31] PIAC also opposed "scarcity pricing" for water[32], as it considered this created a penalty for customers during periods of short term scarcity, which it considered should have been smoothed out through longer-term planning.[33]
- Flow systems stated water usage prices should be set at a level which reflected the value of water as a long-term resource, but supported scarcity pricing in response to drought in the short term.[34]

6.1.4 Our dynamic usage price is equitable and efficient, and consistent with stakeholder preferences

Our draft decision is that the water usage price should be higher in drought periods, to reflect the increased costs of responding to drought, and the expected impact of water restrictions on demand.

Our view is that a higher usage price is more efficient because it recovers these costs while providing an incentive for customers to limit their consumption when water is scarce. Compared to Sydney Water's proposal, which would apportion these costs evenly across customers, under our proposal households that reduce their consumption in drought would benefit, whereas those who do not reduce their consumption would pay more.

Our draft decision provides more certainty for customers compared to Sydney Water's proposed approach. Under Sydney Water's proposal, the increase in the service price due to water restrictions is not set in advance, rather, it depends on the impact of restrictions in the previous financial year. This shifts the revenue risks in responding to drought from Sydney Water to its customers.

29 PIAC submission to IPART, December 2019
30 PIAC submission to IPART, December 2019
31 IPART, Sydney Water Public Hearing 26 November 2019, Transcript p 96
32 Scarcity pricing for water would increase the price when supplies were scarce and to discourage demand, we discuss the difference between our approach and scarcity pricing in Appendix I.
33 IPART, Sydney Water Public Hearing 26 November 2019, Transcript p 95
34 IPART, Sydney Water Public Hearing 26 November 2019, Transcript p 95

6.1.5 We considered a number of ways to set water prices in reaching our decision

In reaching our decision we considered a range of options for setting water prices (in Appendix I). These included:

- Setting the water usage price as a "**scarcity price**" in drought. Under a scarcity price, the water usage price would increase as dam levels fall, to ensure that dam storages are not exhausted before supply augmentations are completed.
- Introducing an **Inclining Block Tariff** (IBT), where households with high water consumption face a higher water usage charge compared to households with low water consumption.

Our indicative modelling suggests that a scarcity price would result in a very large increase in the water usage price in periods of drought. This, in turn, would result in Sydney Water significantly over-recovering its efficient costs in periods of drought, without changing the way prices are set over time. We consider that this would not provide an incentive for Sydney Water to plan for, and minimise the impact of, drought.

We consider that an IBT would send an inefficient signal to customers, in that either the lower water usage charge would undervalue water, or the higher charge would overvalue it – meaning that at least some customers would be sent an incorrect signal about the costs of their water consumption, which could distort consumption and investment decisions. Further, we have not found evidence that an IBT would be more equitable because the largest driver of water consumption is number of people in a household, and not household income.

We do see benefits of introducing more dynamic water usage prices over time, particularly if the adoption of digital metering in the water industry allows households to observe their water consumption patterns in 'real-time'. Our uplift to the water usage price in periods of drought is a step in this direction.

6.2 Base water usage prices and demand forecasts

Our draft decision is to set a base water usage charge of $2.30/kL (excluding inflation), when dam levels are above 60%. This is 9% higher than Sydney Water's proposed water usage charge of $2.11/kL. We have increased this price to better align with our updated estimates of LRMC for water.

As outlined in Appendix K, this usage charge has been set with reference to our best estimate of the Long Run Marginal Cost (LRMC) of providing water, assuming average weather and demand conditions. In Box 6.1, we highlight some limitations of Sydney Water's LRMC estimates, and that we consider that Sydney Water should work closely with stakeholders (including IPART) to develop more robust estimates of LRMC.

To forecast the revenue that Sydney Water would recover from water usage prices, we accepted Sydney Water's proposed water sales forecasts, and we also applied a 1.7% reduction to account for the elasticity of demand as a result of the price increase. Further information on Sydney Water's demand forecasts, and how we estimated the elasticity of demand, is outlined in Appendix J.

Box 6.1 Sydney Water should better understand its future supply needs

An accurate estimate of LRMC is essential for Sydney Water to set an efficient price signal to customers, and to inform its long-term planning decisions.

We consider that the suite of augmentations which Sydney Water used to estimate LRMC model were not robust, because it only identified supply responses that would meet demand growth in the short to medium term, under "average" conditions. It did not estimate the cost of supplying water in the longer-term.

As a next step, we consider that Sydney Water should work more closely with relevant stakeholders, including IPART and the Department of Planning, Industry and Environment, to develop robust, long-term supply options that inform its LRMC estimates, under a range of scenarios. This should include, at a minimum, scenarios that assume:

- Average future conditions (including the "average" impact of climate change)
- Drought conditions, and
- Estimates that include the use of purified recycled water for drinking water.

6.3 Drought demand scenario

Prior to significant rainfall in February 2020, Sydney experienced more than a year of record low dam inflows.[35] Water storage levels were at their lowest level in many years, and it remains uncertain if recent rain will translate into a return to average conditions.

Our drought scenario water usage price and water sales forecasts are designed to recover Sydney Water's additional drought costs, and to account for the effect of water restrictions on demand, without locking in higher prices when Sydney is not in drought.

6.3.1 Sydney Water proposed a series of triggers for drought costs

Sydney Water's drought costs have a number of different triggers including decreasing dam levels, the implementation of water restrictions, and expansion of the Sydney Desalination Plant (Table 6.3).

In theory, a more cost-reflective pricing approach would be to apply a separate price uplift for each of these triggers.

In practice, each of these individual uplifts would be small, see Table 6.3, and would only provide a minor price signal to customers as to the short term impact of their water usage.

35 WaterNSW, *Real-time data* (see link).

Table 6.3 Sydney Water's proposed drought costs (excluding costs associated with expansion of SDP)

	Annual cost $millions	Trigger	Cost per unit of water supplied $/kL	Source
Shoalhaven transfers	14	Dam storage below 75%	0.02	IPART Estimate
Water purchases from SDP	63	Dam storage below 60%	0.12	2017 IPART SDP determination
Water conservation projects based on the Economic Level of Water Conservation (ELWC)	33	Dam storage 40-50%	0.06	SWC November update
	53	Dam storage 30-40%	0.10	
	63	Dam storage below 30%	0.12	
Implementing water restrictions	15	Government implements restrictions	0.03	SWC November update
Water restrictions advertising and communications	10	Government implements restrictions	0.02	SWC November update
Drought management	2	Unclear	<0.01	SWC November update

6.3.2 We have set a single drought price for simplicity

In designing our drought pricing approach, we balanced our preference for prices to be cost reflective with the competing need for prices to be easily understandable. We consider a single drought usage price is simpler for customers, as there is a single trigger based on publicly available information. Also, given the water usage price would be determined on a quarterly basis, customers will have advanced warning of when price increases are likely. This approach also creates a stronger and earlier price signal to conserve water during a drought than waiting for individual cost triggers to come into effect.

We calculated the drought water usage price by starting with the non-drought water usage price of $2.30/kL, and then:

- Added the efficient operating costs of responding to drought,
- Reduced water sales forecasts by 17% to reflect the impact of water restrictions, and
- Included an adjustment to account for the demand response to the higher water usage price.

These result in a drought water usage price of $3.12/kL. They are discussed in turn below.

The efficient operating costs of responding to drought

Our drought usage price recovers Sydney Water's additional operating costs for managing drought. It includes:

- Water conservation costs for programs Sydney Water is required to undertake under the Economic Level of Water Conservation (ELWC) method in its operating licence.[36]
- Additional charges from WaterNSW when Sydney Water accesses water from the Shoalhaven River system. Our drought price includes an estimate of average additional water pumping costs.[37]
- SDP's additional operating costs for supplying water to Sydney Water. Other SDP costs, such as capital costs for the plant and operating costs unrelated to supplying water, are included in the RAB and recovered through normal water prices, see Chapter 3.
- Costs for implementing water restrictions, such as enforcement patrols and public advertising campaigns.[38]
- Overheads for drought management, such as coordination of drought response activities and liaison with over agencies.

We have decided that Sydney Water's contingent capital costs resulting from an expansion of the Sydney Desalination Plant should be recovered through a cost-pass through to the water service charge.

We assumed a 17% reduction in water sales as a result of water restrictions

Our water prices are set to allow Sydney Water to recover the revenue it needs to meet its efficient costs of operating and maintaining its water network. Water restrictions reduce Sydney Water's water sales, which in turn reduces its revenue. Therefore to ensure Sydney can still receive the revenue it needs, the usage price would rise during a drought to offset the impact of lower water sales.

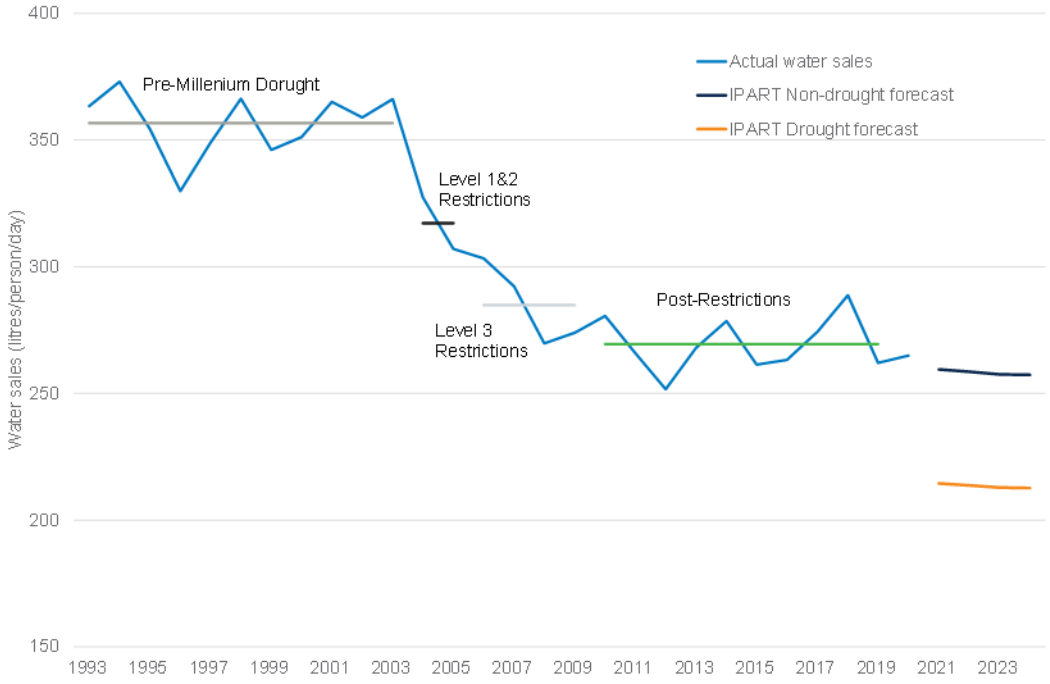
Atkins forecast the likely impact of water restrictions on water sales over the 2020 determination period if drought conditions continued at 2019-20 severity. They recommended a 17% reduction in total demand relative to Sydney Water's non-drought demand forecast (based on a weighted average of the forecast water savings for Level 2 and Level 3 restrictions[39]). They also applied similar reductions to non-revenue demand components such as recycled water top ups and firefighting.

This recommendation is broadly consistent with:

- The water savings achieved during the Millennium Drought. Figure 6.1 shows that Sydney Water achieved a permanent 20% reduction in per capita demand over the period of the Millennium Drought.[40]
- The recent drought experience, where Sydney Water noted a 9.3% reduction in demand for the first six months of Level 1 water restrictions.
- Sydney Water's drought forecasts, which assume an 18.7% reduction in demand during Level 3 water restrictions).

36 Sydney Water, *Operating Licence 2019-2023*, p8
37 IPART, *Review of prices for Water NSW Greater Sydney, from 1 July 2020*, Draft Report, section 8.3.
38 Sydney Water Pricing Proposal, November update, p72
39 Atkins Cardno estimated Level 2 restrictions to be in place for 20% of the determination period and Level 3 restrictions to be in place 80% of the period. Targeted reductions for Level 2 restrictions are based on Sydney Water's targets and Level 3 reductions were based on the mid-point of water reductions during the Millennium Drought.
40 Sydney Water Annual Information Return (AIR)

Figure 6.1 Per capita water sales actuals and IPART forecasts



Note: Horizontal lines through actuals show multi-year averages. IPART forecasts include elasticity adjustments to account for price increases.

Source: November 2019 AIR and IPART analysis

We acknowledge that there is degree of uncertainty in forecasting the impact of restrictions on water demand. We consider Atkins forecasts are reasonable, if somewhat conservative, given the inherent forecasting uncertainty.

We reduced drought scenario water sales by 4.7% because of price increases

The new usage prices we have proposed for drought and non-drought conditions are both higher than current prices, which, all else equal, would reduce the demand for water. We therefore reduced the drought water sales forecast by 4.7% to account for the impact of higher prices on demand (which is measured by 'price elasticity' of demand). We have based these estimates on new modelling Sydney Water undertook on the impact of price changes, as discussed in Appendix J.

Table 6.4 Build-up of draft drought water sales forecasts (ML)

	2020-21	2021-22	2022-23	2023-24
Atkins/Cardno non-drought forecast	517,568	524,342	530,732	538,727
Less 15% reduction from Water restrictions	- 77,635	- 78,651	- 79,610	- 80,809
Less price elasticity	- 20,528	- 20,797	- 21,051	- 21,368
IPART forecast	419,388	424,877	430,055	436,533

6.3.3 We will remove the existing SDP usage charge uplift

Our new drought price takes into account the additional usage charges Sydney Water has to pay to SDP while it is providing water.[41] Given our drought price trigger will align closely with the current operating rules for when Sydney Water receives water from SDP, Sydney Water will be able to recover its additional bulk water costs through the higher water usage price. We have therefore incorporated the existing $0.13/kL SDP uplift to the water usage charge into the new drought water usage price.

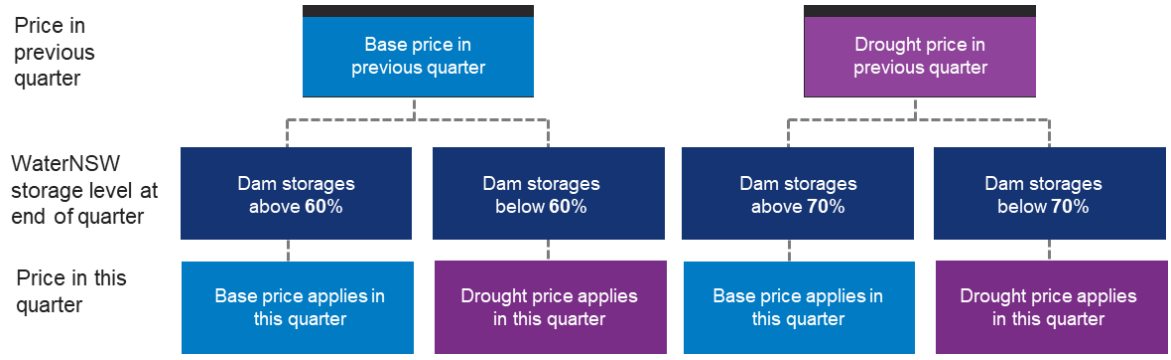
6.4 A '60/70% trigger' for moving between base and drought prices

We decided to implement a '60/70 trigger' for moving between the base water usage price and the drought water usage price. Under this rule, the water usage price will be determined at the beginning of each billing quarter based on the previous WaterNSW weekly water storage report:

- If the base price was in place in the previous quarter, but dam levels are below 60% in the last week of the previous quarter, the drought price will apply.
- The drought price would continue to apply until dam levels are above 70% in the last week of the quarter, at which point the base price would apply going forwards.

The trigger therefore has asymmetric "on" and "off" conditions for the higher drought price, as explained in Figure 6.2.

Figure 6.2 How the 60/70 trigger rule will work



Based on our analysis, we consider the 60/70 trigger rule:

- Would produce significantly less volatile usage prices, compared to a symmetric trigger, (eg, a 60% dam level trigger for both moving to, and away from, the drought price).
- Is consistent with the current operating rules for SDP, and broadly consistent with other drought costs and the impact of water restrictions on demand.

By resetting prices quarterly, this rule still minimises the impact of a large rainfall event quickly filling the dams and removing the need for additional costs.

41 Under IPART's 2017 SDP price determination, from 1 July 2020, Sydney Water will be required to pay SDP $0.63 per kilolitre of water supplied. Currently SDP provides around 15% of Sydney's Water demand.

6.5 Reducing the water service price

After we set the water usage price, we calculated the revenue generated from water usage prices, based on our assumed water sales forecasts. We then set water service prices to recover the remainder of Sydney Water's efficient costs of providing water services.

We have made a draft decision to continue with this approach. Because we made draft decisions to adopt higher water usage prices, the remaining revenue to be recovered from service prices has reduced. Consequently, our water service price for the 2020 Determination period is close to 80% lower than the current water service price.

We have accepted Sydney Water's revised customer numbers

We have accepted Sydney Water's forecast of water customer numbers. This is consistent with the recommendation of our expenditure review consultants, Atkins, who reviewed Sydney Water's forecast of customer numbers.[42]

We set the drought usage charge to keep service charges constant regardless of weather conditions

By allocating both the increased costs of supplying water under the drought scenario and the impact of lower water sales volumes to the water usage price, our draft decisions keep revenue from service charges constant. Therefore, the water service price would remain unchanged in drought and non-drought periods.

6.6 Addressing cost risks

In this section, we present our draft decisions on how our prices address Sydney Water's cost risks. Specifically, we made draft decisions to include three cost pass-throughs to the water service charge to:

- Maintain the existing cost pass-through to account for the difference between Sydney Water's actual and forecast costs of purchasing water from SDP. This formula would also accommodate any potential additional bulk water costs arising from an expansion of SDP.
- Introduce a contingent cost pass-through for the efficient capital costs that Sydney Water would incur in upgrading its network to accommodate an expanded SDP, should the Government decide to expand SDP.
- Maintain a cost pass-through for the difference between actual and forecast Shoalhaven transfer costs that Sydney Water incurs from WaterNSW.

We have included cost pass-throughs for these costs because they meet our cost pass-through criteria (Box 6.2):

- The decision to expand SDP or transfer water from the Shoalhaven system is a defined trigger event outside of Sydney Water's control.
- We have interrogated the proposed expenditures and consider these to be efficient.

42 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 76.

- The increase in Sydney Water's costs would be large enough to impact its operations in the short-term if it was not able to recover these costs.
- The pass-throughs would result in more cost-reflective prices.

Box 6.2 Our criteria for cost pass-through mechanisms

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

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

6.6.1 Costs for expanding SDP would be recovered via the water service charge

We made draft decisions:

24 To maintain the current SDP service charge cost pass-through as described in Appendix O.

25 To allow Sydney Water to recover the capital costs for expanding its network, if it is required to accommodate additional flows from an expanded SDP, via an annual cost pass-through to the water service charge as set out in Table 6.5.

- The trigger for this pass-through would be the NSW Government deciding to expand SDP.
- The cost-pass through would apply from the financial year following the decision.
- At the end of the determination period, the depreciated value of these assets would be added to Sydney Water's RAB and recovered through the NRR.

The NSW Government has begun undertaking detailed planning for expanding SDP. If the Government was to expand the plant during the 2020 determination period, Sydney Water may face two extra fixed costs:

- Additional fixed charges from SDP to cover capital costs for the SDP expansion as set by IPART through a separate review process, and
- Capital costs for augmenting Sydney Water's water transportation network to accommodate additional flows from SDP.

SDP service charge cost pass-through

Sydney Water pays fixed charges to SDP to cover its capital and baseline operating costs, regardless of whether it supplies water. If the Government decided to expand SDP during the 2020 determination period, Sydney Water may face higher charges from SDP. To ensure Sydney Water can recover any such additional costs from its customers, we propose to use the existing cost pass through mechanism to pass through these costs into Sydney Water's water service charges to its customers.

The SDP cost pass-through mechanism would adjust Sydney Water's water service price annually if SDP's charges to Sydney Water vary during the determination. In other words, the SDP cost pass-through adjusts Sydney Water's water service price annually to account for any difference between its forecast SDP costs and its actual SDP costs. We discuss this mechanism in greater detail in Appendix O.

Sydney Water network upgrade costs because of an SDP expansion

In addition to changes in the potential costs of supply from SDP (considered above), we have included a second cost pass-through to account for efficient costs that Sydney Water may need to incur in modifying its network to accommodate an expanded SDP.

Sydney Water is responsible for supplying the water it purchases from SDP. Currently, it distributes desalinated water to customers in the Potts Hill water system only.[43] In its November price update it considered that if SDP doubles its output to 500ML a day, there may not be enough demand in the Potts Hill catchment to consume this volume of water, particularly during winter.

To address this, Sydney Water proposed augmenting its network to allow it to transport water from SDP to its main water distribution point at the Prospect Reservoir.

If the NSW Government decides to expand SDP during the 2020 determination period, Sydney Water's costs of expanding its network to accommodate additional flows from SDP would be recovered through an annual $6.69 per customer cost pass-through to the water service charge (in $2019-20) in each financial year following a Government decision (Table 6.5). This would recover the efficient operating and capital costs of the project. We describe this cost pass-through further in Appendix O.

We would then add the remaining depreciated value of these assets to Sydney Water's RAB in the next determination period, to be recovered from customers through water prices.

Table 6.5 Cost pass-through for SDP network upgrade costs ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Residential customers, and non-residential customers with 20mm meter	6.69	6.69	6.69	6.69

Note: Non-residential service charges for larger water meter sizes are calculated as: (meter size in mm)^{2}x(20 mm meter price)/400.

43 The Potts Hill system provides water to the Sydney CBD, Eastern Suburbs, Sutherland, the Inner West and Bankstown.

6.6.2 Service charge cost pass-through for Shoalhaven transfers

We have made a draft decision:

26 To maintain a water service charge cost pass-through for Shoalhaven transfers as described in Appendix O.

In the 2016 determination, the difference between Sydney Water's forecast bulk water costs and its actual bulk water costs from WaterNSW as a result of Shoalhaven transfers was passed through to Sydney Water's water service charge in the following year. This is because the annual volume, and therefore cost, of Shoalhaven transfers is highly volatile and difficult to forecast.

We have decided to maintain a cost-through mechanism for Shoalhaven transfers. We have amended this mechanism for the 2020 determination to account for drought prices. During normal pricing periods, Sydney Water would still recover all Shoalhaven transfer costs through this cost pass-through. However, during drought pricing periods, the cost pass-through would recover the net of Shoalhaven transfer costs above, or below, our forecast pumping costs. That is, the pass-through would adjust for the difference between the actual costs of Shoalhaven transfers and the costs recovered through the uplift to the water usage price (which reflects forecasts costs of Shoalhaven transfers in drought).

We discuss this mechanism in detail in Appendix O.

6.7 Demand volatility adjustment mechanism

The demand volatility adjustment mechanism (DVAM) rebalances Sydney Water's revenue if it over-recovers or under-recovers its revenue allowance due to a material between forecast and actual water sales.

In our 2016 price review we stated we would consider, at this 2020 price review, an adjustment to the utility's revenue requirement to address any over- or under-recovery of revenue over the 2016 determination period due to material variations (exceeding +/-5% over the whole determination period) between forecast and actual water sales.[44] As a result of this DVAM, our draft decision is to return $20.1 million to customers over the 2020 determination period, to reflect Sydney Water's over-recovery of water revenue (above the +5% deadband) over the first three years of the 2016 determination period.

In its November 2019 price proposal update, Sydney Water proposed a modified DVAM, with an annual adjustment and end-of-period true-up to protect it against revenue risk in the case of prolonged water restrictions.[45] We did not consider this was appropriate as we discuss further below.

We made draft decisions:

27 To reduce Sydney Water's NRR by $20.1 million over the 2020 determination period, to address the over-recovery of revenue by Sydney Water over the first three years of the

44 IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020, Final Report*, June 2016, p 151.
45 Sydney Water, *Update to 1 July 2019 proposal*, 12 November 2019, pp 51-56.

2016 determination period, due to a material difference between its forecast and actual water sales.

28 At the next determination of Sydney Water prices, to consider an adjustment to Sydney Water's NRR to account for over-recovery or under-recovery of revenue due to material differences between forecast water sales and actual water sales over the four years from 1 July 2019 to 30 June 2023.

- A material difference is defined as +/- 5% of forecast revenue from water sales over the four year period.
- Water sales forecasts for 2019-20 are the same as in IPART's 2016 final report.
- To use the quarterly water sales forecasts as set out in Table 6.6, for the 2020-21 to 2022-23 financial years. This would apply the drought, or non-drought, demand forecasts on a quarterly basis, depending on which price and demand forecast is relevant for that quarter.

Table 6.6 IPART quarterly water sales forecasts for the DVAM (ML)

	Non-Drought				Drought			
	2020-21	2021-22	2022-23	2023-24	2020-21	2021-22	2022-23	2023-24
Q1 (Jul-Sep)	121,226	122,830	124,433	125,916	102,960	104,306	105,575	106,861
Q2 (Oct-Dec)	132,421	134,209	135,818	137,400	106,832	108,231	109,550	110,887
Q3 (Jan-Mar)	132,851	134,530	136,094	139,342	105,882	107,269	108,578	111,136
Q4 (Apr-Jun)	122,041	123,626	125,129	126,671	103,172	104,522	105,795	107,086

Source: IPART analysis

6.7.1 We would return $20.1 million to customers

Sydney Water's water sales to customers exceeded our forecasts by more than 5% over the 2016 period. We estimate that actual water sales exceeded our forecasts by 5.7% over the 3-year period to 2018-19. We have reduced the NRR for the 2020 determination period by $20.1 million, which is the additional revenue, in present value terms, above the 5% threshold that Sydney Water recovered from customers over the three years from 2016-17 to 2018-19.

6.7.2 We will retain the current DVAM but with a one year lag

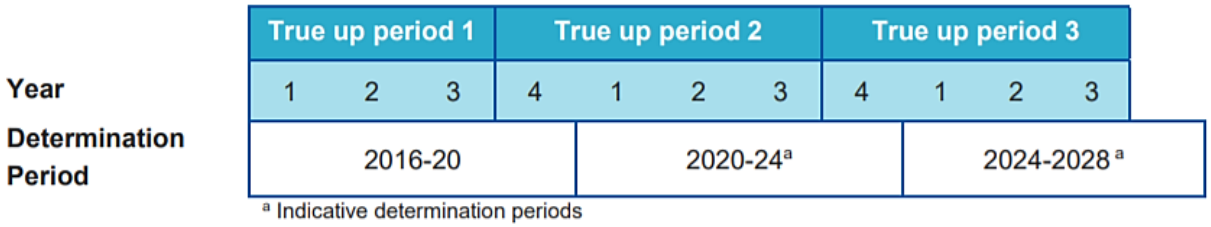
We consider that the DVAM remains relevant for the 2020 determination period, particularly given our new dynamic approach to water usage pricing.

We have accepted the following aspects of the DVAM, which Sydney Water proposed in response to our Issues Paper:

- Continuing to apply a 5% materiality threshold when calculating a demand volatility adjustment.

- Calculating the DVAM based on four years of water sales, lagged by one year from the determination, so that it is based on actual water sales data. The DVAM for the 2020 determination period would consider water sales revenue in four years from 2019-20 to 2022-23, as shown in Figure 6.3. Water sales forecasts for 2023-24 would be considered in the next determination period.

Figure 6.3 Sydney Water's proposed lagged DVAM



Source: Sydney Water Pricing Proposal, 1 July 2019, Attachment 7: Regulatory framework and application, p 8

6.7.3 We will use quarterly water sales forecasts to account for dynamic pricing

Under our draft decision, we would set the water usage price on a quarterly basis. We have also calculated forecast water sales for the demand volatility adjustment on the same basis.

This is because the demand for water is seasonal (with higher consumption typically in hotter months). Furthermore, water restrictions tend to have a larger reduction to demand in these hotter months, as they primarily target discretionary use.

When calculating the materiality threshold for the DVAM in the next price determination, we would use a composite water sales forecast on a *pro-rata* basis between drought and non-drought quarters.

To allocate annual demand forecasts on a quarterly basis we developed seasonality factors for restricted and unrestricted demand. We based these seasonality factors on Sydney Water's monthly demand forecasts for the 2020 determination period for non-drought and drought periods.

We did not produce drought and non-drought forecasts for 2019-20 (the final year of the 2016 determination period). Therefore, when calculating the materiality threshold for the 2019-22 DVAM period we propose to use the water sales forecasts for 2019-20 in our 2016 final report without adjustments.

Table 6.7 Quarterly seasonal demand factors

	Non-drought demand	Drought demand
Q1 (Jul-Sep)	0.95	0.98
Q2 (Oct-Dec)	1.04	1.02
Q3 (Jan-Mar)	1.04	1.01
Q4 (Apr-Jun)	0.96	0.98

Source: IPART analysis of Sydney Water data.

6.7.4 We did not accept Sydney Water's proposed annual DVAM for drought periods

Sydney Water proposed introducing an annual demand volatility adjustment mechanism to protect itself against the risk of a prolonged period of water restrictions that could severely impact water sales revenue. The proposed mechanism would only apply if mandated water restrictions were in place and actual water sales are more than 5% below IPART's allowance. Lost water revenue below the 5% threshold would be recovered through a water service charge adjustment in the following year. The 'standard demand volatility adjustment mechanism'[46] would apply for all years if the annual adjustment mechanism is not triggered.

We did not accept Sydney Water's proposed annual demand volatility adjustment because:

- Our drought water usage price would protect Sydney Water from demand reductions of up to 25% due to drought.
- Our demand volatility adjustment mechanism is already in place, and would allow Sydney Water to recover any lost water revenue if demand reduces by more than 25% in drought.
- Our analysis showed an annual adjustment mechanism could lead to more volatility in the water service charge, compared to the DVAM, which is not preferable.

46 This refers the existing demand volatility adjustment mechanism which applies at the end of the regulatory period and in aggregate.

7 Wastewater prices

Currently, customers pay the following charges for wastewater services:

- Residential customers pay a fixed service charge, which includes an amount for a deemed volume of wastewater discharge.
- Non-residential customers pay a fixed service charge based on the size of their meter, and a per kL usage charge for any wastewater discharge above that of a residential customer.[47]

As summarised in Table 7.1, we have refined how wastewater prices would be set for the 2020 determination period. Our draft decisions are to:

- Maintain the current wastewater usage charge of $1.17/kL for the 2020 determination period (excluding inflation).
- Remove the 150kL deemed discharge allowance for non-residential customers and instead charge based on actual wastewater discharge. This will result in lower bills for the around half of wastewater customers who discharge less than 150kL a year.
- Recover discretionary expenditure for diverting untreated wastewater discharges from Vaucluse-Diamond Bay by adding a new "discretionary services charge" that would be paid by all wastewater customers.
- Maintain a minimum wastewater bill for non-residential customers.

In this chapter, we also outline our view that the wastewater usage price should be set with reference to the long-run costs of providing these services (or LRMC). To that end, we have estimated Sydney Water's LRMC of providing wastewater services by area, and have asked Sydney Water to work on improving our estimates, with a view to setting the wastewater usage price with reference to LRMC in future.

As a result of our draft decisions on Sydney Water's efficient revenue requirement, and how wastewater prices are set, the combined wastewater charge for a typical residential customer would decrease by 16% in 2020-21, and then increase by the rate of inflation over the 2020 determination period.

47 Trade waste charges for non-residential customers with higher strength wastewater discharges are discussed in Chapter 11.

Table 7.1 IPART draft wastewater prices ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Residential					
Residential service charge ($/year)	439.35	340.49	340.49	340.49	340.49
Deemed discharge allowance ($/year)	175.50	175.50	175.50	175.50	175.50
Discretionary service charge ($/year)		1.00	1.00	1.00	1.00
Non-Residential					
Non-residential service charge for a 20mm meter ($/year)[a]	585.80	454.05	454.05	454.05	454.05
Deemed discharge allowance ($/year)	175.50	0	0	0	0
Wastewater usage charge ($/kL)	1.17	1.17	1.17	1.17	1.17
Discretionary service charge for a 20mm meter ($/year)		1.00	1.00	1.00	1.00

a Service charge for 100% sewerage discharge factor.

Note: The non-residential service charge and discretionary service charge for a larger water meter sizes is calculated as: $(\text{meter size in mm})^2 \times (20 \text{ mm meter price})/400$.

We made draft decisions:

29 To maintain the wastewater usage charge at $1.17/kL (in $2019-20).

30 To set the residential wastewater service charge as set out in Table 7.1.

31 To set a deemed residential wastewater usage allowance equal to the wastewater usage charge for 150kL deemed wastewater discharge.

32 To set a non-residential wastewater service charge as set out in Table 7.1, based on the relevant meter size multiplied by the customer's sewerage discharge factor.

33 To remove the discharge allowance component of the wastewater service charge for non-residential customers and instead apply the usage charge to all deemed wastewater discharge.[48]

34 To set a minimum charge to a non-residential meter equal to 75% of the 20mm wastewater service charge.

48 Deemed wastewater discharge is a customer's water usage multiplied by their sewerage discharge factor

Table 7.2 Comparison of current and IPART's proposed wastewater price structures

	Residential customers		Non-residential customers	
	Current	**Draft decision**	**Current**	**Draft decision**
Wastewater service charge	Single charge equal to 75% of the 20mm meter charge	Unchanged	Meter size charge multiplied by sewerage discharge factor	Unchanged
Deemed discharge allowance (included in service charge)	Usage charge for 150kL deemed discharge	Unchanged	Usage charge for 150kL deemed discharge	Remove deemed allowance
Discretionary service charge	N/A	Fixed charge per customer	N/A	Meter size charge
Water usage charge	Do not pay usage charges	Unchanged	Metered discharge[a] above 150kL multiplied by wastewater usage price	All metered discharge[a] multiplied by wastewater usage price
Minimum wastewater bill	Bill is the same for all customers	Unchanged	Residential service charge plus the deemed discharge allowance	Residential service charge

a Metered discharge here is equal to a customers metered water usage multiplied by the customer's sewerage discharge factor.

7.1 Wastewater usage charge

Currently, all customers pay a deemed usage charge, based on the cost of 150kL wastewater discharged.

An explicit wastewater usage charge applies only to non-residential customers who discharge above this amount. These customers pay a wastewater usage charge per kilolitre for the estimated volume of domestic strength waste[49] they discharge into the wastewater system.

As discussed in Section 7.2, we are proposing to remove the non-residential deemed discharge allowance, and charge non-residential only for their estimated discharge.

The wastewater usage price is currently $1.17/kL. For the 2020 determination period, Sydney Water proposed reducing water usage charges to $0.61/kL to reflect the short-run marginal cost (SRMC) of providing wastewater services. However, we propose to maintain the current wastewater usage price over the 2020 determination period (excluding inflation), as:

- Our preference is to base the wastewater usage price on the LRMC of providing wastewater services, and
- We would like Sydney Water to develop a better understanding of its long-run marginal cost (LRMC) for providing wastewater services, before we decide to change the wastewater usage price.

49 The costs of higher strength discharges are recovered through liquid trade waste prices, which are levied on non-residential customers on top of standard wastewater charges.

Table 7.3 Draft wastewater usage charge ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Sydney Water proposed	0.61	0.61	0.61	0.61
IPART draft prices	1.17	1.17	1.17	1.17

Source: Sydney Water, *12 November update p 70* and IPART analysis.

IPART's view on LRMC pricing has changed over time

In our 2012 review of price structures for metropolitan utilities, we decided that wastewater usage charges should be set with reference to (but necessarily at) the short run marginal cost (SRMC) of transporting, treating and disposing of domestic strength effluent. We argued that SRMC is more applicable for non-residential sewerage pricing since the current sewerage systems are based around individual sewerage plants that are not interconnected.

In our 2016 Sydney Water price review, we indicated that there were various arguments for and against SRMC versus LRMC pricing. Sydney Water agreed that LRMC was a relevant concern given ongoing population growth and the need for additional infrastructure.[50]

More recently, as part of our 2019 Central Coast Council water price review, we indicated that the LRMC of supplying wastewater services is a more appropriate basis for setting wastewater usage prices, and this is our current thinking.[51]

LRMC is a more appropriate basis for setting wastewater usage prices

We consider the LRMC of supplying wastewater services is a more appropriate basis for setting wastewater usage prices. This is because the LRMC includes both the short-term operating costs, and the long-term capital costs, associated with an additional unit of wastewater discharge.

Setting wastewater usage prices with reference to LRMC has the following potential benefits. It provides a more efficient price signal, particularly to large non-residential customers, who could adjust their consumption and investment decisions. LRMC would encourage competition, as it would inform the value of any avoided costs for private-sector wastewater or recycled water schemes. This, in turn, could promote the viability of recycled water schemes, particularly if separate LRMCs are estimated for each catchment area of Sydney Water's network.

We estimated LRMC of Sydney Water's wastewater catchments

Sydney Water's planning documents indicate it anticipates considerable capital investment in many of its wastewater catchments as a result of population growth. Based on these documents, we developed LRMC estimates for 18 of Sydney Water's 27 wastewater catchments. These estimates included short-run costs such as treatment and transport as well as long-run capital costs.

50 2016 final report p 160.

51 IPART, *Review of Central Coast Council's water, sewerage and stormwater prices*, Final Report, May 2019, p 105.

Sydney Water's wastewater catchments are determined by geography and therefore vary considerably in size, treatment technology, and future growth projections. This is reflected in our LRMC estimates, which ranged from $0.80/kL for the Cronulla catchment to $15.98/kL for the small Bombo catchment south of Wollongong. The average LRMC across all catchments is $3.40/kL, noting this is heavily weighted towards Sydney Water's three largest catchments: Malabar and North Head, and Bondi (Table 7.4). We also note that our estimates of SRMC, by catchment, also varied considerably. A full list of our estimates and a map of Sydney Water's wastewater catchments is at Appendix K.

Table 7.4 Comparing wastewater LRMC estimates for large catchments and the network as a whole ($2019-20)

	Dry weather flow GL/yr	LRMC $/kL	Short-run operating costs $/kL
Bondi	44.5	1.43	0.60
Malabar	165.3	2,78	0.44
North Head	119.7	3.51	0.49
Other catchments	115.8	4.96[a]	0.90[a]
All catchments	**445.4**	**3.40[a]**	**0.59[a]**

[b] Average weighted by dry weather flows.

Note: LRMC estimates include forecast capital augmentations to address growth and an estimate of operating costs for treatment and transport.

Source: IPART analysis of Sydney Water data.

Our analysis of these LRMC estimates indicates that:

- The estimates are generally lower for the large ocean outfall catchments in eastern and southern Sydney than for smaller catchments in western and northern Sydney, and the South Coast region.
- Catchments experiencing rapid population growth such as West Camden and Riverstone have very high LRMC estimates. This reflects the high cost of constructing new treatment capacity (compared to amplifying capacity at an existing treatment plant in an established catchment area).
- LRMC was generally higher in inland catchments with secondary and tertiary treatment than those with primary treatment. This is because the costs of secondary and tertiary treatment – including future capital costs – are typically higher. With that said, some tertiary treatment catchments without significant augmentation needs, such as Cronulla and Quakers Hill, had low LRMC estimates.
- Meeting environmental standards are a potential driver of future costs in some catchments, especially wet weather overflows and Hawkesbury-Nepean discharge targets.

We would like to work with Sydney Water to improve these estimates to develop a better understanding of Sydney Water's actual cost drivers. These by-catchment LRMC estimates could also provide a basis of avoided costs could be achieved for recycled water schemes.

Sydney Water opposed using LRMC to set the wastewater usage price

As we noted in our Issues Paper, Sydney Water proposed reducing the wastewater usage price by 48% to more closely reflect SRMC. In response to our Issues Paper Sydney Water reiterated that it supports pricing based on LRMC in principle; however, in practice LRMC is not an appropriate basis at the present time. Specifically it considered SRMC was:

- Well understood and administratively simple.
- Is likely to be more stable than LRMC.
- Is more efficient relative to a poorly calculated LRMC.

It considered there was not sufficient information to create accurate estimates of future capital needs across so many catchments. It argued an inaccurate estimate could lead to inefficient pricing outcomes. It argued the need for a postage stamp price across all catchments would mean a wastewater usage price set with reference to LRMC would be too high in low cost catchments and far too low high cost catchments. It considered this would lead to "inefficient-bypass" in low cost catchments, where customers could invest excessively in on-site recycling, or other technologies to reduce discharge and strand otherwise efficient Sydney Water assets.

Sydney Water also acknowledged a too low wastewater usage charge could lead to underinvestment. However, it argued this could be mitigated through other mechanisms such as its new Operating Licence requirement to report current and projected capacity constraints which could assist private utilities to identify opportunities for market entry.

Sydney Water also noted that given wastewater usage is particularly inelastic, so an increase in the wastewater usage charge may not have a large impact on behaviour.

A lower wastewater usage price does not address Sydney Water's concerns

We consider Sydney Water's concerns around the accuracy of LRMC pricing can be overcome with better information and do not justify a *lowering* of the wastewater usage charge. In our Issues Paper, we addressed many of barriers Sydney Water identified for setting wastewater charges[52] and we consider LRMC pricing is preferable in the future.

In some ways, estimating the LRMC for wastewater should be simpler to estimate than for water. The main driver of wastewater augmentation costs is growing hydraulic load, which is far more predictable than water availability. Capacity constraints, such as treatment plants and trunk mains, also tend to be localised and predictable.

The majority of Sydney Water's existing customer base, and a large proportion of growth, is contained within its Malabar and North Head catchment areas. A postage stamp LRMC estimate would be fairly close to the estimates for these two areas. Our LRMC analysis indicates the Bondi catchment is the only catchment with a large number of non-residential customers and an LRMC estimate that is significantly less than the weighted average - and therefore the only catchment with the risk of inefficient bypass. Conversely, LRMC estimates in "growth" catchment areas have LRMC estimates that are at, or above, the average system costs.

52 IPART issues paper pp 98-100.

Residential customers' wastewater discharges are fairly inelastic, however, this is largely irrelevant as their bills are effectively fixed, regardless of the wastewater usage price. Lowering the wastewater usage price provides even less incentive for large non-residential customers to minimise their wastewater discharge, and these are the only customers with significant scope to curb their discharges to delay augmentation costs in most catchments.

Sydney Water also consulted with non-residential customers in proposing to reduce the wastewater usage price. However, at outlined in our Issues Paper, we did not consider this consultation to be reflective of customer preferences, because Sydney Water did not consult with residential customers, who would pay more if we decided to lower the wastewater usage price.

Stakeholder submissions were mixed

Stakeholders provided mixed feedback on how wastewater usage prices should be set.

Flow Systems supported moving towards setting wastewater usage prices with reference to the LRMC of wastewater servicing, due to longer term capital spending being critical to ecologically sustainable wastewater treatment capacity.

Open Cities expressed a preference for a greater proportion of costs to be recovered from usage prices, to recognise usage and discharge reductions and efficiencies achieved by customers of recycled water utilities. PIAC, and Professor Peter Coombes, also supported setting explicit usage prices for residential customers.

We consider that setting the wastewater usage price with reference to a robust estimate of LRMC, would promote efficient consumption and investment decisions by non-residential customers, and encourage the efficient entry of private sector schemes into the market.

With respect to setting an explicit wastewater usage price for residential customers, we agree with the analysis of the Productivity Commission, which did not support a wastewater usage price to send price signals to residential customers. It noted:

> ….it is unlikely that demand for domestic sewage services can be influenced by price to the same degree as demand for water overall, given that households have less scope to adjust their use of indoor (as opposed to outdoor) water in response to price changes, which is what determines wastewater production.[53]

7.2 Wastewater service charge

In this section, we discuss our draft decisions on how we set wastewater service prices. Specifically, to:

- Remove the deemed wastewater discharge allowance for non-residential customers to make prices more cost reflective for small non-residential customers.
- Continue to apply a sewerage discharge factor when setting the service price for non-residential customers.
- Maintain the current 150kL discharge allowance for all residential customers

53 PC 2011, *Australia's Urban Water Sector*, p 143

- Maintain a minimum charge for non-residential customers.
- Include a separate service charge to recover the costs of the Vaucluse Diamond Bay project.

7.2.1 Sydney Water proposed increasing wastewater service charges

Sydney Water proposed increasing the wastewater service charge by 7%. However, because the wastewater usage charge would be lower, the net result is that the total wastewater charge would be lower, as shown in Table 7.5.

Under our draft decisions to maintain the wastewater usage price and eliminate the deemed allowance for non-residential customers, our fixed charges are lower than Sydney Water's proposed prices, especially for non-residential customers.

Table 7.5 Comparison of Sydney Water and IPART proposed wastewater fixed charges ($2019-20)

	Current prices	Sydney Water proposal	IPART draft decision
	2019-20	2020-21	2020-21
Residential			
Wastewater service charge ($/year)	439.35	471.25	340.50
Deemed usage charge ($/year)	175.50	91.51	175.50
Total	**614.85**	**562.76**	**516.00**
Non-Residential			
Wastewater service charge for 20 mm meter ($/year)[a]	585.80	628.34	454.00
Deemed usage charge ($/year)	175.50	91.51	0.00
Total	**761.30**	**719.85**	**454.00**

[a] Assumes 100% sewerage discharge factor.

Source: Sydney Water November update, IPART analysis

7.2.2 Removing the deemed wastewater allowance for non-residential customers

Currently all residential and non-residential customers' bills include a deemed wastewater allowance equal to the wastewater usage charge for 150kL of discharge. Non-residential customers are then charged explicitly for wastewater discharges in excess of 150kL. We have decided to remove this allowance for non-residential customers in the 2020 determination period and instead charge non-residential customers only for their actual usage. This will result in lower usage charges for the around half of non-residential customers that discharge less than 150kL.

We propose to maintain the 150kL discharge allowance for residential customers. This reflects that residential wastewater discharges tend to be more predictable than non-residential customers and 150kL is a reasonable estimate for typical discharge for a residential customer. It is also more difficult to relate water usage and wastewater discharge for residential customers given the considerably different levels of outdoor usage between residential

customers. Non-residential customers can more closely relate their water usage and wastewater discharge by requesting Sydney Water to review their discharge factor.

Making wastewater prices more cost-reflective

In our 2019 Central Coast Council Price Determination, we removed the discharge allowance from non-residential customers' service charge as we considered that non-residential customers' wastewater prices will be more transparent and cost reflective if they were based on all discharges being calculated on metered water usage multiplied by the relevant discharge factor.[54] We estimate an average non-residential who currently discharges less than the discharge allowance, discharges 52kL a year. Under our proposed prices this average customer would save $115 a year.

There are pros and cons to removing the deemed allowance. On the one hand:

- Non-residential customers who discharge less than the discharge allowance that we set would face more 'cost-reflective' bills.
- It would overcome the quarterly billing issue in the current arrangement whereby non-residential customers with seasonal businesses pay for usage above their allowance quarterly, even when they do not exceed the allowance over the year.
- Removing deemed discharge is a step towards more usage based pricing, which is consistent with our intention to move toward LRMC-based usage pricing for wastewater.

On the other hand, it will introduce inequity between residential and non-residential customers as residential customers who discharge less than 150kL of wastewater would pay the full allowance while non-residential customers would not.

There would also be a small decrease in revenue recovered for non-residential discharges which will be recovered through higher meter connection (service) charges, mostly from residential customers. We estimate wastewater service charges are about $2 a year higher as a result of this change.

On balance, our draft decision is to remove the deemed wastewater component for non-residential customers as it is a move towards more cost reflective prices, albeit only for one segment of the customer base.

7.2.3 Continue to use discharge factors when setting wastewater service prices

The discharge factor measures the percentage of a customer's water consumption that is discharged to the wastewater network. They effectively convert the size of a water meter to a wastewater meter (for meter-based service charges) and to estimate wastewater discharge volumes (to apply wastewater usage charges). Discharge factors are used because, unlike water consumption, wastewater discharges are often not separately metered.

54 IPART, *Review of Central Coast council's water, sewerage and stormwater price to apply from 1 July 2019*, Final Report, May 2019, p 102.

Frontier Economics, in its 2018 report on the regulatory barriers to water recycling,[55] recommended that IPART consider the merits of removing the discharge factor applying to wastewater service charges.

However, no further analysis of this recommendation was provided by Frontier Economics.

Our draft decision is to continue to use discharge factors to set wastewater prices, because:

- A customer's discharge factor reflects its potential peak load on the wastewater system, and this is the principle on which we allocate the fixed costs across customers.
- Neither utility proposed a change to the status quo.
- There would be a significant price impact on non-residential customers with low discharge factors, without a clear rationale for making this change. If we removed discharge factors, we estimated that nearly 5% of non-residential customers – over 3,000 customers – would see a bill increase of over 50%. Furthermore, 1% of customers would see their bill at least double.

7.2.4 Maintaining the same wastewater service charge for houses and apartments

Our draft decision is to maintain the same deemed discharge allowance for residential houses and apartments.

We considered setting different discharge allowances for houses and apartments.

Sydney Water provided analysis which suggested that, based on the current discharge allowance, a typical house would have an effective discharge factor of 68% and an apartment would be 94%.[56] Sydney Water argued this is reasonable given the different water use characteristics of houses and apartments. That is, that apartments, discharge a larger portion of their water into the wastewater system, compared to houses, which use more water on pools and gardens that does not enter the wastewater system.

After analysing data provided by Sydney Water, as well as the IPART household survey, and we consider that there is not strong evidence for setting different discharge allowances for houses and apartments, given their differing water usage characteristics.

7.2.5 Maintain a minimum charge for non-residential customers

We currently set a minimum wastewater service charge to non-residential customers. This is set so that the service charges for each non-residential meter is no less than the standard residential charge (ie, 75% of the 20mm service charge plus the deemed discharge allowance). We have made a draft decision to retain this minimum charge. Without a minimum charge, some non-residential customers with a low discharge factor could pay significantly less than residential customers.

55 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling*, July 2018, p 75. (See link)

56 The discharge factor is the deemed ratio of wastewater discharge to water usage for a property. For comparison, Sydney Water's default discharge factor for calculating non-residential wastewater usage charges is 78%. See Sydney Water, Pricing proposal to IPART, July 2019, Attachment 4, p 31.

7.2.6 The wastewater service charge includes discretionary expenditure on the Vaucluse-Diamond Bay project

Sydney Water proposed to upgrade its wastewater system at Vaucluse-Diamond Bay to stop the daily release of untreated wastewater from three cliff-face outfalls during dry weather.

As discussed in Chapter 9, our draft decision is to allow Sydney Water to recover these costs of this project from all of its wastewater customers. We decided to recover the costs of the Vaucluse-Diamond Bay project through a specific discretionary services component of the wastewater service charge. This charge would be $1.00 a year ($2019-20) for all residential customers. Non-residential customers would pay a meter-based charge, set with reference to a $1.00 a year charge for a 20mm meter.

We have recovered the costs of this project as a separate charge, and expect Sydney Water to transparently communicate the size and purpose of this charge to customers. The qualification is that it is up to Sydney Water to decide whether it does so by itemising this expenditure as a separate line item on the bill. As discussed in Chapter 9, we have requested that Sydney Water outlines how it communicates its discretionary projects to customers.

7.3 Billable wastewater volumes and customer numbers

We use forecast billable wastewater volumes[57] and wastewater customer numbers to set wastewater service charges, specifically:

1. We multiply forecast billable wastewater volumes by the wastewater usage charge to estimate the share of the wastewater NRR recovered from usage charges, and then
2. Divide the remainder of the wastewater NRR by the forecast number of wastewater customers[58] to calculate the wastewater service charge.

Sydney Water has forecast a 1.8% annual increase in residential customers and a 0.6% annual increase in non-residential customers. Our expenditure review consultants, Atkins, reviewed Sydney Water's proposed customer numbers. Following their review, we have accepted Sydney Water's proposed wastewater customer numbers for the 2020 determination period.

We forecast that billable wastewater volumes to increase by 11% from 2019-20 to 2020-21, primarily as a result of our decision to remove the deemed discharge allowance for non-residential customers.[59] We then forecast billable volumes to increase by around 0.2% a year over the 2020 determination period, consistent with forecast growth in non-residential customers.

As show in Table 7.6, we calculated our billable wastewater volumes by accepting Sydney Water's forecast increases, which are based on the predicted increase in customer numbers. We then adjusted the forecasts to account for the increase in billable wastewater usage due to our decision to remove the 150kL deemed discharge allowance for non-residential customers.

57 Billable wastewater is wastewater discharged by non-residential customers on which the wastewater usage charge applies.

58 Customers here means the number of residential customers plus the number of non-residential 20mm equivalent meters (i.e. larger non-residential meters count as more than one 20mm equivalent).

59 Previously, discharges of less than 150kL a year were not explicitly "billable" even though customers still implicitly paid the usage price for these discharges through the discharge allowance.

Table 7.6 Build-up of IPART's billable wastewater volumes (ML)

	2019-20	2020-21	2021-22	2022-23	2023-24
Sydney Water forecast	80,110	80,177	80,267	80,430	80,578
Plus estimate of wastewater volumes covered by the deemed volume		8,536	8,519	8,519	8,519
IPART forecast		88,713	88,806	88,949	89,096

Note: We estimate the average discharges for customers who currently discharge less than the current allowance is 52kL.

Source: IPART analysis of Sydney Water data.

8 Stormwater drainage prices

Sydney Water provides stormwater services to about 25% of its customers, who are within its stormwater catchment areas.[60] We set stormwater charges for all residential and non-residential customers in these stormwater catchments. We also set separate stormwater charges for customers in the Rouse Hill stormwater catchment.

Our draft decision is to maintain the way we set stormwater prices.

- **Residential customers** would pay a fixed charge which is higher for houses than apartments.
- **Non-residential customers** would be charged based on their land area. Non-residential customers in multi-unit buildings pay the same rate as residential apartments.
- Customers which make a small contribution to stormwater loads would be eligible a **low impact** rate.

Under our draft decisions, stormwater prices would fall by 5.3% in 2020-21 and then remain constant over the 2020 determination period (excluding inflation).

We have also accepted Sydney Water's proposed price reductions for Rouse Hill stormwater customers.

8.1 Stormwater prices

We made a draft decision:

35 To set the charges in Table 8.1 for Sydney Water customers in declared stormwater catchments.

60 Sydney Water provides a searchable map of its stormwater catchments at https://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/stormwater-catchment-map/

Table 8.1 IPART's proposed stormwater drainage charges ($2019-20)

$ per annum	2019-20	2020-21	2022-23	2022-23	2023-24
Residential					
Unit/Low impact	24.62	22.80	22.80	22.80	22.80
Stand-alone house	78.88	73.04	73.04	73.04	73.04
Non-Residential					
Multi-premise/Small (<200 m^2)	24.62	22.80	22.80	22.80	22.80
Low impact/Medium (201-1,000 m^2)	78.88	73.04	73.04	73.04	73.04
Large (1,001 - 10,000 m^2)	459.67	425.62	425.62	425.62	425.62
Very Large (10,001 - 45,000 m^2)	2,043.03	1,891.71	1,891.71	1,891.71	1,891.71
Largest (>45,000 m^2)	5,107.59	4,729.29	4,729.29	4,729.29	4,729.29
Vacant Land					
Vacant Land	78.88	73.04	73.04	73.04	73.04
Low Impact assessed Vacant Land	24.62	22.80	22.80	22.80	22.80
All customers					
Waterways Health Improvement Program	0.00	0.85	0.85	0.85	0.85

Source: Sydney Water pricing proposal, November 2019, p 102, Atkins/Cardno, IPART analysis.

In its July 2019 initial price proposal, Sydney Water proposed increasing stormwater prices by 8%. Sydney Water attributed this increase to higher capital expenditure for managing deteriorating assets and its new Waterways Health Program. In its November 2019 price update, this increase was revised to a smaller price increase of 2.7% compared to 2019-20 prices, due to lower interest rates and minor changes to proposed stormwater expenditure.

Our draft decision is that Sydney Water's stormwater prices would be 5.3% lower than current prices, and then increase at the rate of inflation over the 2020 period. This reflects the recommendations of our expenditure review consultants (Atkins), which are discussed in Chapters 3 and 4, as well as our decisions on the WACC, discussed in Chapter 5.

8.1.1 We propose to maintain constrained area pricing

Our draft decision is to maintain the current 'constrained area-based' approach for setting non-residential stormwater prices. Under this approach, larger properties pay higher stormwater charges overall, but the charge per m^2 is relatively lower compared smaller properties, which pay proportionally more per m^2 than larger properties.

We have decided to maintain the current approach and general price structure for setting Sydney Water's stormwater charges, as:

- We consider that prices should be cost-reflective and reflect an impactor pays approach (whereby the party that created the need to incur the cost pays). A property's land area is a reasonable and readily available proxy for the costs that each property imposes on the stormwater system.

- It recognises that land area is a key cost driver, but not the only cost driver, of stormwater costs. A variety of factors determine each property's contribution to the stormwater system, such as land size and slope, vegetation or proportion of impervious area, land use, soil type, on-site retention and reuse and property management.
- We consider that continuing to charge on a constrained area-basis mitigates potential bill impacts on any one customer group (in this case, larger properties) associated with transitioning to or adopting a different price structure.
- It is consistent with the existing stormwater pricing approach for Hunter Water and the Central Coast Council.

8.1.2 We have maintained the low-impact customer category

We have also maintained the low impact discount, for residential and non-residential customers who demonstrate their properties make a relatively small contribution to stormwater load, for example by storing or reusing stormwater collected on their property. The low-impact rate for residential customers would be set equal to the charge for apartments. The low-impact rate for non-residential customers would be set equal to a medium sized non-residential property.

8.1.3 Stakeholder feedback was mixed

We received three stakeholder submissions to our Issues Paper that addressed stormwater charges.

On one hand, the Property Council of Australia supported Sydney Water's proposed approach to calculating stormwater charges on a constrained area basis.

On the other hand, two submissions (from Mr Michael Mobbs, and Professor Peter Coombes) recommended that stormwater pricing should be better aligned with local government rates. Mr Mobbs also raised concerns that customers could be better informed on how to qualify for bill reductions through the low impact category.

We acknowledge the concerns raised by Mr Mobbs and Professor Coombes. However, implementing their proposals would require changes to the legislative framework for local government charges, which is beyond the scope of this review.

Sydney Water provides information about the low-impact 'discount' on stormwater charges on its website.[61] This website explains which customers might be eligible for the low-impact rate and provides a direct link for customers to apply for the low-impact rate.

8.1.4 Stormwater customers would also fund the Waterways Health Improvement Program

Sydney Water proposed expenditure for a Waterways Health Improvement Program, to improve the quality of waterways across its stormwater network. As this is not a requirement

61 Available at: https://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/stormwater-network/discount-on-low-impact/index.htm

of Sydney Water's operating licence, we considered this as a discretionary project. Sydney Water noted it had engaged with customers on this program and considered there is willingness to pay.

As we discuss further in Chapter 9, we consider Sydney Water has demonstrated customers are willing to support this outcome and it should be included in prices. Indeed, customers may be willing to pay more to achieve even better environmental outcomes from an expanded program.

For the 2020 determination period, we have set a price of $0.85 per year, recovered from all stormwater customers, to fund the Waterways Health Program. We have decided not to scale this charge with property size for non-residential customers as it is not clear that these costs should increase with the volume of run-off leaving a customer's property, as it does for general stormwater costs.

8.2 Rouse Hill stormwater charges

Sydney Water owns and manages trunk drainage services in the Rouse Hill area as well as a large amount of flood-prone land. The stormwater drainage system in Rouse Hill consists of large areas of open space to accommodate flood flows, natural creeks and grass lined channels, and artificial wetlands.

There are currently two charges that are levied on properties within the Rouse Hill Area:

- **A Rouse Hill stormwater drainage charge,** which recovers the operating costs of the drainage system, including for activities such as cleaning out trash racks, regenerating bushland and weed and ground management.
- **A Rouse Hill land charge,** which recovers a portion of Sydney Water's capital expenses for the same system. It is charged to new properties that connect (or have connected) to Sydney's water system in the Rouse Hill stormwater catchment area between 1 July 2012 to 30 June 2026.[62]

We have accepted Sydney Water's proposal to gradually reduce Rouse Hill stormwater charges by 13.3% over the 2020 determination period (excluding inflation). We largely accepted Sydney Water's proposal to reduce land charges in 2020-21 and then hold prices constant for the 2020 determination period (excluding inflation), updating Sydney Water's proposed prices for our draft WACC of 3.2%.

We made draft decisions:

36 To set the stormwater drainage charges and land drainage charges for Rouse Hill stormwater customers as set out in Table 8.2.

37 To continue to exempt Kellyville Village customers from Rouse Hill stormwater drainage and land drainage charges, and instead charge these customers the residential charges as set out in Table 8.1.

62 Sydney Water, Pricing proposal to IPART, July 2019, Attachment 4, pp 9-10.

Table 8.2 IPART's draft prices for Rouse Hill stormwater prices ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Stormwater drainage charge	149.25	142.91	136.56	130.22	123.87
Land drainage charge[a]	389.38	323.45	323.45	323.45	323.45

[b] Land drainage charges apply for five years to new properties connecting to the Rouse Hill stormwater network between 1 July 2012 and 30 June 2026.

Source: Sydney Water 12 November update p 74.

8.2.1 Rouse Hill stormwater drainage charges

Sydney Water proposed gradually reducing its Rouse Hill stormwater drainage charges from $149 per year in 2019-20 to $124 per year in 2023-24 (excluding the effect of inflation). In the 2016 Determination, IPART set these charges so that Sydney Water could recover its cumulative operating expenditure (as prices had previously been set at levels less than forecast costs) from Rouse Hill customers by 2022–23.

Sydney Water has indicated that its updated modelling is that its cumulative operating position is on track to break even by 2022–23, after which the charge can be set to recover ongoing operating costs only. It proposed a gradual transition to smooth stormwater prices from $151 per year in 2019–20, to $114 per year in 2023–24, excluding the impacts of inflation.

Our draft decision is to accept Sydney Water's proposed price transition.

We have also maintained our current pricing approach where we set an annual fixed stormwater drainage charge for residential and non-residential properties with areas less than or equal to 1,000m^2, and the annual fixed charge *times* land area in m^2/1000 in real terms for non-residential properties greater than 1000m^2. That is, a pure area-based charge for non-residential properties greater than 1000 m^2.

8.2.2 Rouse Hill land drainage charges

Sydney Water has proposed to reduce the land charge by 13% from $389 per year in 2019-20 to $346 per year in 2020-21 (excluding the effect of inflation). According to Sydney Water, this is due to an anticipated increase in property growth over the next period, driven by an increase in density in greenfield areas such as Box Hill.

Currently new properties that connect (or have connected) to Sydney Water's system in the Rouse Hill stormwater catchment area between 1 July 2012 and 30 June 2026, pay the Rouse Hill land drainage charge for a five year period.

We set the land charge in the 2016 determination to recover 50% of the net present value of Sydney Water's efficient and prudent capital costs in Rouse Hill over 2012-13 to 2025-26. We added the remaining 50% to Sydney Water's wastewater RAB and recovered through general wastewater prices across Sydney Water's broader customer base.

We received one stakeholder submission to our Issues Paper that addressed Rouse Hill charges. The Property Council of Australia expressed support for Sydney Water's proposal to gradually reduce the Rouse Hill stormwater drainage charges over the 2020-24 period.

Our draft decision is to accept Sydney Water's proposed approach to set land drainage charges for the Rouse Hill area. However, we have set a lower draft price because interest rates have fallen. Our draft prices assume a WACC of 3.2%, whereas Sydney Water assumed a WACC of 4.1% in its calculations.

8.2.3 Continuing to exempt Kellyville Village properties from Rouse Hill stormwater drainage charges until at least 2024

Kellyville Village properties were originally excluded from Rouse Hill charges as they existed prior to the Rouse Hill development and were treated by the (now defunct) Kellyville Wastewater Treatment Plant. However, properties in Kellyville Village are now connected to the Rouse Hill integrated water system (although they do not receive recycled water).

In the 2016 Sydney Water Final Report, we indicated that there was merit in charging Kellyville Village residents the Rouse Hill stormwater drainage charge because this charge reflects the costs of the services Kellyville Village properties actually receive. However, we did not adopt this position, as we did not have time to consult on this issue as it was raised late in the 2016 Sydney Water price review.

Kellyville Village properties currently pay Sydney Water's standard stormwater drainage charges until they are redeveloped. In its 2020-24 Price Proposal, Sydney Water indicated its preference for Kellyville Village properties to continue to pay the standard stormwater charge over the 2020 determination period, and then to pay the Rouse Hill stormwater drainage charge from the next price review (ie, 2024). By 2024, the Rouse Hill stormwater drainage charge would be closer to Sydney Water's standard stormwater drainage charges. Sydney Water has recommended delaying charging Kellyville Village properties the Rouse Hill charge to manage bill impacts.

On balance, we agree with Sydney Water's proposal to commence charging Kellyville Properties the Rouse Hill stormwater charge in 2024, as this minimises the price impacts on the properties.

However, we seek comment from stakeholders on Sydney Water's proposal to defer charging these properties the Rouse Hill charge until the following determination period.

IPART seeks comment on the following:

1 Do you agree with our draft decision to continue to exempt Kellyville Village customers from Rouse Hill stormwater drainage and land drainage charges?

9 Discretionary expenditure

Discretionary expenditure is expenditure by a utility to provide services or achieve outcomes that are beyond the service standards or environmental obligations specified in the utility's operating licence or other regulatory requirements.

Sydney Water has included two discrete discretionary expenditure projects in its pricing proposal:

- To upgrade its wastewater system at Vaucluse-Diamond Bay to stop the release of untreated wastewater during dry weather, and
- To deliver improved waterway health through stormwater management activities, as part of a Waterways Health Improvement Program (WHIP).

This is the first time we have explicitly set prices to recover the costs of discretionary projects. We have adopted this approach to allow and encourage utilities to be responsive to their customers. Demonstrating customer support and ensuring accountability are the underpinning principles of our approach to discretionary expenditure.

We have developed a draft framework to guide our assessment of discretionary expenditure, and to ensure the delivery of the commitments made by utilities to their customers is subject to the appropriate oversight (see Appendix P). We have also made draft decisions on Sydney Water's proposed discretionary expenditure, and how the costs of this discretionary expenditure should be recovered from customers. Chapter 13 outlines the output measures that track the delivery of discretionary expenditure.

9.1 Customer engagement is a key element of a utility's pricing proposal

As outlined in our *Guidelines for Water Agency Pricing Submissions*, a utility should have a strong and up to date understanding of its customers' preferences, and this should inform a utility's decision-making and pricing submission.[63]

In our 2016 Sydney Water pricing review we noted that we would consider, and could allow, discretionary expenditure to be recovered via regulated prices, but that we would require clear evidence that the utility's customers have the capacity and willingness to pay for the discretionary expenditure.[64] Our recycled water framework also allows for the costs of recycled water schemes to be recovered from the broader customer base to the extent that there is sufficient evidence that the broader customer base is willing to pay for the external benefits of the recycled water scheme.

It is our view that significant or material changes to a utility's service standards, environmental obligations or other regulatory outcomes should be addressed through

63 IPART, *Guidelines for Water Agency Pricing Submissions*, November 2018, pp.20-21.

64 IPART, *Review of prices for Sydney Water Corporation from 1 July 2016 to 30 June 2020 - Final Report*, June 2016, p 37.

appropriately consulting with customers and the entity which enforces the regulation, so that any update to standards or regulations reflects community preferences.

However, where the cost to achieve a discretionary outcome is relatively small, utilities can propose recovering expenditure through prices from either part of, or its entire, broader customer base.

9.2 We have developed a framework for discretionary expenditure

We made a draft decision:

38 To establish a discretionary expenditure framework, to apply to current and future discretionary proposals.

We have developed a framework to outline our principles for evaluating discretionary expenditure proposals, including:

1. our assessment criteria
2. the appropriate pricing structures and prices, and
3. the ongoing requirements as discretionary projects are implemented.

Our framework provides guidance to the utilities and establishes processes and checks to ensure that the prices paid by customers are no more than they are willing to pay for the discretionary projects, and that the characteristics of the projects are aligned with those described to customers. A summary of our framework can be found in Table 9.1, and Appendix P.

Our framework has two stages.

- Stage 1 – **Assessment** - Phases 1 to 3 of our framework outlines the steps we will take to assess a utility's proposed discretionary expenditure, including whether it is a discretionary project, has customer support and the expenditure is efficient.
- Stage 2 – **Delivery and Oversight** - Phases 4 and 5 of our framework focus on implementation, and measures to ensure delivery of the projects in line with customers' expectations.

Table 9.1 Overview of our discretionary expenditure framework

Phase	Description
Phase 1: Project definition	▼ **The project or outcome is adequately described and defined**. At a minimum, the project or outcome specification must include the following characteristics and conditions: – Location, customers/users benefiting from (or creating the need for) the project, delivery timeframes, whether it will be replacing another service and outcomes expected. ▼ The project or outcome **fits within the utility's responsibilities and is related to its monopoly services.** ▼ The project is discretionary.
Phase 2: Willingness to pay	▼ Survey participants are given **sufficient context and information** on the proposed project or outcome. This should align with the characteristics and conditions of the project definition identified in Phase 1. ▼ The survey identifies customers' maximum **willingness to pay in dollar amounts**. These will be the upper limit to **the customer share of cost of the project/outcome** estimated in Phase 3**.** ▼ The survey used to elicit customer willingness to pay is **well designed and results are statistically valid.** ▼ Bill impacts should be shown in the context of the broader bill impact.
Phase 3: Efficiency test	▼ **The project/s is prioritised and optimised** within the utilities' broader responsibilities. ▼ The project/s is the **most efficient way of achieving the outcome**. ▼ Total efficient cost estimates should transparently **net off any avoided costs and/or grants.**
Phase 4: Recovery & delivery incentives	▼ The proposed **prices to customers recover only the efficient cost** of the outcome or project determined in phase 3. ▼ Bill impact per household is equal to or less than willingness to pay from phase 2. ▼ Charges are recovered from customer categories whose willingness to pay was assessed in phase 2. ▼ **A separate RAB** with appropriate asset lives to enable discretionary expenditure to be tracked. ▼ Transparent and accountable – utility to develop and propose approaches to ensure accountability. ▼ Next period adjustment will consider whether any underspend is returned to customers or retained by the utility for other projects or as an efficiency gain.
Phase 5: Implementation & performance commitments	▼ **Capture the program as an output measure** to ensure sufficient reporting on what is achieved. ▼ **Ex-post adjustment mechanism** to ensure only investments in line with project definition in willingness to pay survey are added to the RAB. ▼ Where proposed expenditure is not carried out or outcomes are not delivered, funds collected through the discretionary charge may be returned to customers in the subsequent determination period. ▼ The **charge remains equal to or below demonstrated willingness to pay amount** over the long term.

9.2.1 Assessment of a utility's proposed discretionary expenditure

We first consider whether a proposed project is sufficiently related to a utility's monopoly service provision, and then whether it is necessary to meet a utility's mandatory obligations or if it is discretionary.

What is discretionary expenditure?

A utility's proposal can include two categories of costs. These are the costs to:

- Comply with its **mandatory obligations**. For example, service levels under its operating licence and environmental licence obligations set by the Environment Protection Authority (EPA). We set prices to recover the efficient level of these costs that enables a monopoly service provider to deliver its services in compliance with its other regulatory obligations.
- Undertake **discretionary projects**. These are projects which are not driven or required by an external regulator or body.

The framework encourages investment that reflects customer preferences

Our framework emphasises the importance of demonstrating customer willingness to pay for discretionary projects. Utilities should aim to conduct robust and well-designed willingness to pay surveys which produce statistically significant results. This will ensure that any expenditure proposals put forward by a utility will be sufficiently supported and, therefore, will likely be approved. The application of this framework is new, and we acknowledge that utilities are still developing their approaches to discretionary expenditure proposals. Therefore, we expect Sydney Water to recognise and adopt potential improvements during the next four years.

We engaged a consultant, Gillespie Economics, to provide guidance on demonstrating willingness to pay, and to review the willingness to pay survey conducted by Sydney Water.[65] As willingness to pay acts not only as an important gauge of customer support, but also as a cap on the contribution we allow a utility to recover from customers, it is important that these studies have integrity and are based on the appropriate principles. In our view, it is also important that these studies can be used when assessing the costs and benefits of significant projects.

The required evidence of willingness to pay should be proportional to the proposed expenditure

We note that it is important that the extent of the willingness to pay surveys conducted by the utility are proportionate to the relative quantum of the discretionary expenditure proposed compared to its overall expenditure proposal.

Two approaches to willingness to pay studies were identified from utilities' pricing proposals:

- **Economic willingness to pay studies,** which elicit the maximum willingness to pay across the population of customers for defined environmental, social or cultural outcomes.
- **Market research based willingness to pay studies,** which estimate the proportion of customers who would be willing to pay a price that would cover the costs of different levels of a proposed investment.

65 Gillespie Economics, *Assessment of Hunter Water's and Sydney Water's Customer Willingness to Pay Surveys*, *Report for IPART*, January 2020.

The first type of study provides an estimate of the indirect and non-use benefits that a project may provide to the customer base. This value may be higher if people outside the customer base also value an outcome.

We recognise that the size of the proposed discretionary expenditure influences the level of resources and evidence required to demonstrate that each element of the framework has been met. For example, a small-scale capital project should not necessitate the same extensive customer engagement and gateway processes, including a cost-benefit analysis and economic willingness to pay study, as a larger project.

A market research approach may be appropriate for smaller proposed discretionary investments, and for selecting projects to engage further with customers on from a menu of possible projects without requiring the same level of detail as an economic measure of willingness to pay.

Economic willingness to pay studies, however, should be conducted in conjunction with a market research approach, cost-benefit analysis, and business case for larger projects, to ensure that thorough and robust processes are in place to support greater amounts of proposed expenditure.

Costs should only be recovered from categories of customers with demonstrated willingness to pay

We consider that there should be alignment between the categories of customers surveyed to demonstrate willingness to pay, and the categories of customers that bear the cost of discretionary expenditure.

Utilities should only recover the efficient level of expenditure

As part of our framework, we apply our usual efficiency test to discretionary capital expenditure to ensure customers are only charged the efficient cost of delivering the project or outcome. Where the proposal is for a specific project, it can be included in the expenditure review with other capital expenditure, including ex-post capex reviews.

Where the proposal is for a funding envelope to deliver an outcome over the determination period, we would expect to see accurate estimates of likely outcomes and that any efficiencies that materialise through the implementation of a program could result in the delivery of 'more' of the outcome, to the extent this is consistent with customers' willingness to pay.

9.2.2 Implementation of a utility's discretionary expenditure

Ensuring utilities are accountable for the delivery of the project

We need to hold utilities accountable for any proposed discretionary expenditure. The delivery of the utility's proposal should match the customers' understanding of what they are paying for, and the outcome should be delivered over the specified timeframe at an efficient cost. This is particularly important given the absence of any additional regulatory processes such as obligatory service standards or environmental standards that a utility must uphold in relation to this type of expenditure.

Transparency is important to ensure that the utility's activities and prices are well understood by stakeholders and its customers. Achieving discretionary outcomes come at a cost to the customer, and are outside of the mandated requirements on utilities in delivering their monopoly services to their customers. It is important that customers fully understand the implications of these outcomes on prices.

Ensuring transparency and accountability to customers

To enhance transparency and accountability around discretionary expenditure to customers, we consider that utilities need to adequately inform customers about the discretionary charges they will incur, and the outcomes these charges will deliver. Examples of this could include presenting the discretionary expenditure charge as a separate line item on customer bills (the Customer Supported Programs charge); distributing information pamphlets to customers; or directing bill payers to the utility's website for further information on discretionary expenditure including charges and expected outcomes.

Delivery incentives

We are aiming to provide incentives that ensure that utilities are accountable to customers, and that they appropriately gauge project risks prior to making commitments to customers.

When considering the incentives to ensure project delivery, the utility should be aware of the financial implications if it cannot meet its stated outcomes on which it has gained community support. We realise that this assessment may involve judgement, however, many of the projects that would be classed as discretionary would be discrete in nature and amenable to defining a clear set of outcomes.

The clear incentive for focus on delivery will be achieved through:

- Our standard approach to ex-post adjustments to capital expenditure during the next review, coupled with
- A next period adjustment to assess whether any underspend is returned to customers, used to provide similar outcomes, or retained by the utility as an efficiency gain. This is a slightly different approach to our standard approach, as we are focussed on discrete discretionary proposals which may not be 'part' of a much wider expenditure profile where it is expected that proposed expenditure would be subject to on-going review and re-prioritisation as part of normal business.

This approach will achieve outcomes based regulation for program expenditure which is closely aligned with customer preferences.

9.3 Sydney Water's proposed discretionary expenditure

After a substantial customer engagement program, Sydney Water has proposed two projects as discretionary expenditure for the 2020 determination period. We discussed Sydney Water's proposed discretionary projects in our Issues Paper, noting that we intended to apply best practice principles for demonstrating willingness to pay to assess whether the expenditure should be approved for this review. Using these principles as a basis, we have applied our framework for assessing discretionary expenditure to the two proposed projects. Our draft

decision is to set prices for Sydney Water to recover the costs of these projects from its customers in the 2020 determination period.

We made draft decisions:

39 To allow Sydney Water to recover the costs of the following projects from its broader customer base:

- For the wastewater ocean outfalls at Vaucluse-Diamond Bay, $62.2 million recovered from all wastewater customers as a meter based charge, as shown in Table 9.2 and Table 9.3.
- For the Water Health Improvement Program, $22.2 million recovered from all stormwater customers on a per property basis, as shown in Table 9.4 and Table 9.5.

40 To request that as part of its response to this Draft Report, Sydney Water outlines how it proposes to ensure progress on discretionary projects is communicated effectively to its customers.

In developing this framework, we acknowledge that since it is the first time we have assessed proposed discretionary expenditure, we have exercised a level of discretion in allowing Sydney Water to levy discretionary charges for these projects. We have also considered stakeholder submissions, and that all submissions who commented on Sydney Water's proposed discretionary projects expressed strong support for them.

There are a number of requirements within the framework which aim to ensure transparency and accountability for utilities, which we developed after receiving the proposals for discretionary expenditure from both Hunter Water and Sydney Water. We consider that these should be applicable to future proposals.

9.3.1 Diverting untreated wastewater from ocean outfalls at Vaucluse-Diamond Bay

Sydney Water has proposed to upgrade its wastewater system at Vaucluse-Diamond Bay to stop the daily release of untreated wastewater from three cliff-face outfalls during dry weather. Sydney Water proposes to do this by building new infrastructure that would divert the wastewater to a treatment plant in Bondi, so it would be treated before being released into the ocean at Bondi.

Sydney Water has proposed $63.5 million in capital expenditure in 2020-2024 to build assets and divert the wastewater to the Bondi treatment plant. Upon completion, untreated discharges of wastewater through the ocean outfalls will only occur during wet weather events.

Our assessment of the Vaucluse-Diamond Bay discretionary project

On balance, our draft decision is to allow Sydney Water to recover the efficient costs of the proposed Vaucluse-Diamond Bay project from its wastewater customers (see Tables 9.2 and 9.3).

On one hand, Sydney Water developed this project using appropriate gateway processes, and customers were consulted on their willingness to pay through an extensive engagement

program. Our expenditure consultants also consider that this project is an appropriate and prudent approach to divert wastewater flows from Vaucluse-Diamond Bay.

On the other hand, Sydney Water's surveys did not sufficiently explain the benefits and need for the proposed expenditure. It did not quantify the improvement to the environment and health outcomes for the community. Rather, the focus was on the activity that Sydney Water proposed to address – reducing the release of untreated wastewater from cliff-face outfalls in dry weather.

We do not question that customers are willing to pay for improved environmental and health outcomes. Rather, the limitations of the customer surveys mean we are uncertain of customers' willingness-to-pay for the outcomes of this expenditure. The Vaucluse-Diamond Bay project is a relatively large capital investment, and we consider it important that Sydney Water address these concerns in the future.

We seek further feedback from stakeholders, including Sydney Water and the EPA, on the benefits of this project.

Table 9.2 Prices for the Vaucluse-Diamond Bay discretionary project ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Residential charge (20mm) ($/year)[a]	1.00	1.00	1.00	1.00
Base non-residential charge ($/year)[b]	1.00	1.00	1.00	1.00

[c] This charge is the 20mm charge with a 75% discharge factor applied, consistent with residential wastewater charges.

[d] This charge is the 20mm equivalent charge with a 100% discharge factor applied. Due to the nature of non-residential customers, the discretionary charge applied will vary depending on individual meter sizes and discharge factors.

Note: Totals may not add due to rounding.

Table 9.3 Efficient costs for the Vaucluse-Diamond Bay discretionary project ($2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Efficient capital expenditure ($ million/year)[a]	11.5	15.7	19.9	15.1	62.2
Efficient operating expenditure ($ million/year)	0.4	0.4	0.4	0.4	1.6

[e] A cumulative 0.8% efficiency factor has been applied to the capital cost.

Note: Totals may not add due to rounding.

9.3.2 Waterway Health Improvement Program (WHIP)

Sydney Water has proposed to deliver improved waterway health through stormwater management activities that will increase: the length of waterways in good health; areas of planted native vegetation; sets of recreation facilities; and the amount of rubbish and litter removed from Sydney waterways each year.

Sydney Water proposed capital expenditure of $16.1 million over the 2020 period.

Our assessment of the WHIP discretionary project

Our draft decision is to allow Sydney Water to recover the efficient costs of the proposed WHIP from its stormwater customers only (see Tables 9.4 and 9.5). Furthermore, we have provided an allowance of $22.2 million to Sydney Water over the 2020 determination period, which is $6.5 million more than Sydney Water's proposal.

This amount will cover costs related to managing impacts of stormwater on the water quality of waterways in Sydney Water's declared catchments. Overall, our assessment is that Sydney Water has developed the WHIP through the appropriate gateway processes, and that the project has sufficient customer support to proceed.

In proposing expenditure of $16.1 million over the 2020 period, Sydney Water's deferred about $8.0 million of expenditure to the following regulatory period. However, our expenditure review consultants found that the deferred projects were well-defined, and given customers are willing to pay for better waterway health outcomes in the current period, that Sydney Water should deliver the full program in the 2020 period.

We agree with Atkins assessment, and have allowed Sydney Water to recover the full costs of the program over the 2020 period. We note some specific issues in relation to Sydney Water's customer consultation and discretionary expenditure proposal in Appendix Q.

Table 9.4 Prices for the WHIP discretionary project ($2019-20)

	2020-21	2021-22	2022-23	2023-24
Stormwater customer charge ($/year)[a]	0.85	0.85	0.85	0.85

[f] We have applied the WHIP discretionary charge to all Sydney Water stormwater customers despite meter size.

[g] A cumulative 0.8% efficiency factor has been applied to the capital cost.

Note: Totals may not add due to rounding.

Table 9.5 Efficient costs for the WHIP discretionary project ($2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Efficient capital expenditure ($ million/year)[a]	8.1	6.1	2.7	5.4	22.2

[h] A cumulative 0.8% efficiency factor has been applied to the capital cost.

Note: Totals may not add due to rounding.

9.3.3 Sydney Water should better understand customer preferences for improved environmental outcomes

In its response to our Issues Paper, Sydney Water considers its Waterways Health Improvement Program is required to achieve mandatory standards in its Operating Licence. We have treated the project as discretionary expenditure, as we consider Sydney Water is currently not obliged to deliver the WHIP to meet its monopoly service obligations. Sydney Water's future licence obligations could be refined to include explicit requirements to deliver this expenditure.

More importantly, we consider it likely that customers are willing-to-pay for better waterways outcomes well beyond the current scope of Sydney Water's Waterways Health Improvement Program. We have included an allowance of less than $1 per year from stormwater customers to fund this program; and if this expenditure was recovered from Sydney Water's full customer base, the costs would be less than $0.20 per year. However, we cannot approve further expenditure in this review, without sufficient evidence of customer willingness-to-pay, or a well-defined expenditure program.

As outlined in our Issues Paper, our view is that Sydney Water's customer engagement has significantly improved since its 2015 pricing proposal. We encourage Sydney Water to do more to consult with its customers on their willingness-to-pay for improved environmental and health outcomes; for example, through increased expenditure on waterways health, and managing wastewater overflows.

9.4 Future application of the framework

In some instances, it may be possible that expenditure that is discretionary when proposed by the utility becomes part of meeting its monopoly service obligations. This could occur when licence conditions or mandatory environmental standards are changed such that expenditure initially proposed to exceed standards, is now expenditure to meet the new (higher) standards.

There are a number of requirements within the framework which ensure transparency and accountability for utilities, which should be addressed in future proposals.

In future price reviews, we will encourage utilities to apply our framework to any proposed discretionary expenditure, to ensure that all criteria have been met and our principles of transparency, accountability and efficiency are upheld.

We made a draft decision:

41 To request that Sydney Water include a business case, proposed output measures and customer engagement strategies in future discretionary expenditure proposals.

10 Recycled water prices

Recycled water is wastewater or stormwater that has been collected and treated so that it can be reused for urban irrigation, industrial processes, environmental flows, and some residential uses such as garden watering and toilet flushing.

In July 2019, we finalised a review of the pricing arrangements for the public water utilities' recycled water schemes, which:

- considered how to fund recycling schemes
- considered how to set prices to customers of recycled water schemes
- set a methodology to calculate developer charges for recycled water schemes.[66]

The revised approach promotes cost effective water recycling and seeks to ensure that recycled water is assessed in the same way as other options for delivering water and wastewater services.

This chapter provides an overview of the key elements of our recycled water framework. We discuss our draft decisions on prices for recycled water that Sydney Water provides, and how IPART treats the revenue from recycled water schemes.

Our decisions outlined in this chapter align with the approach we established in our 2019 recycled water review. They are broadly consistent with Sydney Water's proposal.

10.1 Our recycled water framework

For funding purposes, we distinguish between 'least-cost' or 'higher-cost' recycled water schemes:

- A 'least-cost' scheme is the most efficient way of supplying water, wastewater and/or stormwater services.
- A 'higher-cost' scheme is one which is not least-cost.

Under our framework, least-cost schemes are funded by the broader customer base. For example, if a recycled water scheme is the least cost way of providing wastewater services (ie, the collection, treatment and disposal of wastewater), then the utility can recover its costs from the broader customer base via wastewater prices. Sydney Water has two 'least-cost' recycled water schemes.

Higher-cost schemes can also be funded by the broader customer base via water and/or wastewater prices, to the extent the scheme results in any:

- Avoided water and/or wastewater costs (net of any foregone revenue to the utility) to the broader customer base

66 IPART, Review of pricing arrangements for recycled water and related services, 1 July 2019.

- External benefits, as shown by the broader customer base's willingness to pay.

Any remaining costs of a higher cost recycled water scheme (ie, the scheme's costs less the value of avoided costs + external benefits recovered from the broader customer base), should be ring-fenced and be recovered from:

- Any external funding sources, including any government or third party contributions
- Customers of the recycled water scheme, and/or
- Recycled water developer charges.

For this price review, Sydney Water has not made a claim for any additional deferred or avoided costs to be recovered from its broader customer base.[67] Sydney Water has also not sought any additional revenue to be recovered from its broader customer base based on their willingness to pay for any external benefits of recycled water schemes.

When setting prices, we distinguish between recycled water schemes on the basis of customer choice:

- A scheme is considered **mandatory** if customers have no effective choice but to be supplied by the recycled water scheme. For these, we monitor prices against our pricing principles and may step in to set prices where we deem there is cause, including if we are requested to.
- A scheme is considered **voluntary** if customers have effective choice about whether to be supplied by the recycled water scheme. For these, we encourage unregulated pricing agreements and would set prices under a scheme-specific review if requested to do so by customers or the public water utility.

We also distinguish schemes where IPART has been directed by Government under Section 16A of the IPART Act, to fund the difference between the efficient cost of a recycled water scheme and the revenue that Sydney Water receives from customers of the scheme.

Figure 10.1 below provides an overview of our approach and Table 10.1 shows the recycled water schemes that Sydney Water currently operates.

67 In the 2012 Sydney Water price review, IPART agreed to Sydney Water's claim for avoided costs for one of its mandatory recycled water schemes (Rouse Hill) to be added to the RAB. This was an increase to the water RAB of $2.1 million and wastewater RAB of $18.0 million. No further avoided costs on recycled water schemes have been claimed since.

Figure 10.1 Key elements of IPART pricing arrangement for recycled water

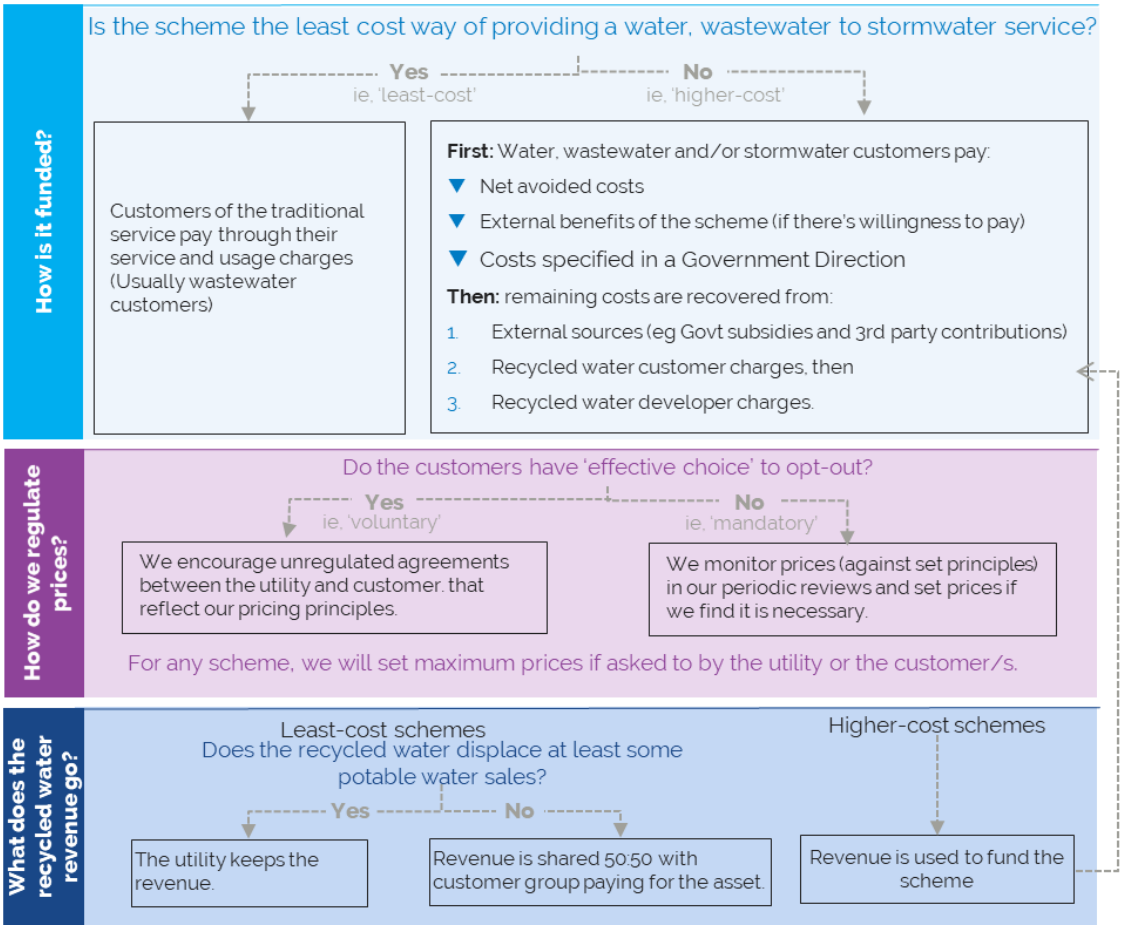


Table 10.1 Sydney Water's recycled water schemes

Section 16A	Mandated schemes	Voluntary schemes	Least cost schemes
Rosehill-Camellia	Rouse Hill	Wollongong	Picton
St Marys – Western Sydney Replacement Flows	Hoxton Park	6 schemes at golf courses	Gerringong-Geroa
	Oran Park and Turner Road	2 irrigation schemes	
	Colebee	4 other schemes	
	Ropes Crossing		

Source: Sydney Water Price Proposal 2020-24, Attachment 14 Recycled Water, July 2019; Sydney Water AIR SIR Nov 2019; Email correspondence with Sydney Water, 22 January 2020

10.2 Section 16A recycled water schemes

The Government can issue directions for Sydney Water to complete projects in the public interest, which may not be in the shareholders' interest.[68] At the same time, it can direct IPART (with the Minister's approval) under section 16A of the IPART Act to include the efficient costs of complying with specified requirements in Sydney Water's prices.[69] This can take the form of either:

- A 'standing direction' (which applies whenever IPART makes a determination in relation to a particular government monopoly service), or
- A 'one-off direction' (which applies when IPART makes a particular pricing determination).

Sydney Water has two schemes to which Section 16A directions apply:

- **The Rosehill (Camellia) Recycled Water Project**. This was issued to IPART in March 2008. The broader customer base funds the difference between the charges that Sydney Water pays to the owner of the Rosehill (Camellia) Recycled Water infrastructure and distribution pipelines, and the revenue Sydney Water receives for the sale of recycled water.
- **The Replacement Flows Project (St Marys Recycled Water Project).** This was issued to IPART in August 2007. We assessed the efficient costs of construction and ongoing operation of the project which is funded by the broader customer base.

10.2.1 The full benefits of Section 16A recycled water schemes are not being realised

As part of our expenditure review, our consultants Atkins has assessed Sydney Water's proposed expenditure of the schemes under Section 16A. Atkins did not recommend any scope adjustments in operating expenditure to mandated s16A recycled water services. However, they were critical of the underperformance of the Rosehill-Camellia and the St Marys' treatment plants over the 2016 determination period.

Atkins has found that the full benefit of these schemes has not been realised. For Rosehill-Camellia, a lack of customers means the production capacity of the plant is not being utilised fully and Sydney Water management should be more pro-active in finding customers and alternative uses of the recycled water. For St Marys, the plant has not been running to design output and with a lower output than planned. Despite the variation in output volumes, the fixed costs are largely unchanged, thus Sydney Water management should work to maximise output of this plant.

Atkins has recommended enhanced monitoring and reporting of these output volumes to highlight this issue.

For our draft decision, we agree with Atkins' recommendation that we will not adjust the forecast expenditure for Sydney Water's mandatory s16A recycled water schemes. However,

68 Typically through a direction given under section 20P of the SOC Act.

69 Under Section 16A(3) of the IPART Act the Government may ask IPART to recover certain costs from the customer base, if the costs are: a requirement imposed by or under a licence or authorisation; a requirement imposed by a ministerial direction under an Act; or some other requirement imposed by or under an Act or statutory instrument.

we intend to introduce an output measure on the volume of recycled water produced (ML/day) against capacity from each of the Rosehill-Camelia and the St Mary's plants, over the 2020 determination period. Further detail on output measures is discussed in Chapter 13.

10.3 Sydney Water's proposed prices for mandatory schemes meet our pricing principles

Sydney Water has five existing mandatory recycled water schemes. As outlined above, we monitor Sydney Water's proposed prices for these, and we will only step in and **determine** maximum prices when we identify a need to do so, or if we are asked to.

We made a draft decision:

42 To continue to defer setting prices for Sydney Water's recycled water schemes.

We assessed Sydney Water's proposed prices for its mandatory recycled water schemes against our pricing principles (Box 10.1). We found Sydney Water's proposed prices are reasonable and therefore we will not determine prices.

Box 10.1 Pricing principles for mandatory recycled water services

The structure and level of recycled water prices:

1. Should ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand, and should entail an appropriate allocation of risk.
2. Should include a usage charge, which must have regard to the price of substitutes (such as potable water and raw water). Where the usage charge exceeds the substitute price, water utilities must demonstrate willingness-to-pay by the recycled water customer.
3. May include a fixed service charge, which should have regard to customer impacts, willingness-to-pay and not act as a material incentive for customers to disconnect from the recycled water scheme.
4. Should have regard to an efficient distribution of costs between recycled water customers and developers, in line with our funding framework for mandatory recycled water services.
5. Should be simple and understandable.

10.3.1 Sydney Water's prices for mandatory schemes

Sydney Water's existing mandatory schemes service residential developments. These schemes are also 'higher-cost', and hence their costs are ring-fenced from the broader customer base.

Sydney Water has proposed to:

- Set the usage price at $1.90/kL. This is 90% of Sydney Water's proposed potable water usage price of $2.11/kL. Sydney Water has clarified that $1.90/kL is its intended price regardless of any uplifts to its potable water usage price.[70]
- Not set a service charge. This is consistent with its current practice.

Table 10.2 shows our assessment of Sydney Water's proposed prices for its mandatory schemes against our pricing principles.

Table 10.2 Our assessment of Sydney Water's proposed prices against the pricing principles

Principle	Our assessment
1	The price is likely to support a balance of supply and demand. Sydney Water's recycled water usage price is 10% (or $0.21/kL) lower than its proposed potable water usage price, and is significantly lower than our draft potable water usage price. It does not intend to increase the price in line with adjustment to the potable water usage price from drought-related cost pass-throughs. This would effectively mean a greater saving relative to potable water. Whilst a lower price does not necessarily mean greater customer demand, Sydney Water has advised that the flexibility to offer a lower price to encourage demand could be particularly useful in locations with a high volume of water to be managed. Based on current information, we consider that appropriate price signals are sent to balance supply and demand.
2	The usage charge is set lower than the potable water usage price, which is the alternative for these customers.
3	Sydney Water proposed no fixed charge. This is consistent with guidance in our 2019 framework that "utilities should be cautious in adding new fixed charges to customer bills".
4	Sydney Water's mandatory schemes are partially funded through customer usage charge contributions and developers have provided partial contributions in the capital works stage. However, these funds received do not recover the costs of running these schemes.
5	The overall structure is straightforward and easy to understand.

10.3.2 Accept Sydney Water's recycled water usage price of $1.90/kL, independent of our two-tiered water usage price

Our draft decision is to accept Sydney Water's proposed recycled water usage price of $1.90/kL, constant in real $2019-20 over the 2020 determination period.

Whilst Sydney Water has derived this proposed price based on 90% of its proposed water usage charge of $2.11/kL, Sydney Water has clarified that $1.90/kL is its intended price for recycled water usage charges, regardless of any drought-related adjustments to the potable water usage price, such as the uplift for the operating costs of SDP. Sydney Water has advised that this is for number of reasons:

> The SDP uplift is intended to recover the incremental variable operating costs incurred when the Sydney Desalination Plant is producing water in accordance with the operating rules set by the Metropolitan Water Plan. It also sends a price signal to water users in accordance with the impactor pays principle.

70 Email correspondence with Sydney Water, 22 January 2020.

While most recycled water schemes use some potable water for top-up, the volume used is unlikely to have a material impact on the timing or duration of operations at the desalination plant.

In addition, for public health reasons customers have been educated to regard their purple pipes as delivering recycled water, and a change to prices risks creating confusion.[71]

We consider Sydney Water's proposed recycled water usage price of $1.90kL for its mandatory schemes over the 2020 determination period is reasonable and consistent with our pricing principles. Therefore, we see no reason to step in and set this price in the determination. We consider it reasonable that this price is independent of the potable water usage prices, as this:

- **Could encourage greater demand for recycled water -** A greater price difference between recycled water and water usage prices would likely provide greater incentive for customers to consider recycled water as an alternative water source. This incentive strengthens during drought, where our water usage price would increase.
- **The costs of recycled water do not increase in drought -** The 2019 Framework notes that utilities cannot set prices to recover more that the efficient cost of the scheme. Our draft decision to increase higher water usage prices in drought reflects the higher costs of providing water during periods of scarcity, and the impact of water restrictions on water demand. These factors do not affect recycled water and hence do not support a higher recycled water price in times of water scarcity. Sydney Water has not proposed additional drought-related expenditure on recycled water schemes.
- **There is no direct relationship between water usage prices and recycled water usage prices** - Sydney Water's existing mandatory and voluntary recycled water schemes are ring-fenced (apart from a proportional allocation of Sydney Water's total corporate costs to these recycled water schemes). Thus, there is no strong case to maintain an arbitrary 90% pro-rata linkage of the recycled water usage price to potable water usage prices.

10.3.3 Some stakeholders expressed a need to incentivise recycled water

A few submissions to our Issues Paper expressed a view that recycled water should be incentivised to address the issue of increasing water scarcity. Most referred to increasing the amount of recycled water being used.

The Committee for Sydney anticipates that recycled water will play a larger role in our water supply system, however noted community scepticism toward recycled water. The Committee therefore supports the current policy of providing a discount on recycled water at 90% of the price of potable water. Sydney Water's proposed approach to set prices less than the potable water usage price, and without the service charge, aligns with this stakeholder's view.

We also note that our funding framework for the public water utilities' recycled water schemes allows for recognition of the system-wide benefits of recycled water schemes. It ensures the costs of a recycled water scheme will be recovered where its benefits (as measured by avoided costs, external benefits and recycled water customers' willingness to pay) are equal to or greater than its costs.

71 Email correspondence with Sydney Water, 22 January 2020.

10.3.4 We are satisfied that the remaining schemes are not mandatory

Sydney Water's remaining two recycled water schemes in Picton and Gerringong-Geroa are 'voluntary', as the recycled water customers, who are non-residential, would have lower barriers to leave the scheme. For these schemes, we encourage unregulated pricing agreements and therefore we will not determine prices, unless requested to by either Sydney Water or the recycled water customers – which has not occurred.

10.4 We reviewed the share of revenue from least-cost recycled water schemes

In our 2019 review of recycled water pricing, we decided that where there is a least-cost recycled water scheme, the public water utility should retain all of the revenue earned from recycled water sales, as compensation for displaced potable water sales.

We made a draft decision:

43 To treat forecast revenue from least-cost recycled water schemes by:

- For schemes where recycled water displaces potable water sales, allowing the utility to retain the revenue, and
- For schemes where recycled water does not displace potable water sales, sharing the revenue on a 50:50 ratio with the broader customer base.

10.4.1 Not all recycled water displaces potable water

For this review, we have distinguished between those least-cost schemes where the recycled water used displaces potable water sales, and those where it doesn't. In most cases, we would expect recycled water use to displace potable water sales.

Sydney Water identified that both of its least cost schemes do not result in potable water savings.[72]

Our draft decision is to share revenue from recycled water sales from these schemes with the broader customer base, because the broader customer base has paid for the asset (essentially on the basis that it is providing a wastewater service) and they should share in a return on the additional revenue, in line with our approach to other sources of non-regulated revenue. The share of revenue to the water utility still provides an incentive to find more least-cost schemes, albeit less than if the utility retained the revenue in full.

For simplicity, the default approach allows the utilities to retain 100% of the revenue if at least **some** potable water sales are displaced by the recycled water scheme. We will share the revenue on an exception basis, ie, where it is clear that the scheme is not displacing potable water sales. Otherwise, Sydney Water should keep the recycled water revenue from least cost schemes.

72 Email correspondence with Sydney Water, 22 January 2020; Sydney Water, Water Conservation Report 2018-19, Table C-1, p40.

10.4.2 The revenue to be shared with customers is minimal

The revenue to be shared with customers has a minor impact on water prices, as it is subtracted from the NRR before water prices to the broader customer base are set (see Chapter 5 for more information). Our draft decision will result in adding $50,000 per annum to Sydney Water's revenue requirement.

Sydney Water identified two least-cost schemes that did not replace potable water sales.[73] We have reviewed Sydney Water's forecast revenue from these schemes and the current revenue sharing arrangement between Sydney Water and its customers. For one of these schemes, the rental income is captured under Sydney Water's rental income and proposed to be a 90% share to Sydney Water and 10% to customers. For the other scheme, currently all the forecast revenue is deducted from its proposed operating costs, ie, all the revenue is given to customers. Our draft decision is to make a revenue adjustment to reflect a 50:50 share of revenue with customers for both schemes.

73 Email correspondence with Sydney Water, 22 January 2020

11 Other prices

Sydney Water provides a range of services beyond those outlined in previous Chapters. This chapter explains our draft decisions on charges for these services, specifically:

- Non-residential trade waste
- Miscellaneous and ancillary charges (including Sydney Water Developer Direct)
- Fees for late and declined payments
- Unfiltered water
- Unmetered water

Appendix L discusses how we categorise certain types of properties as 'residential' or 'non-residential'.

11.1 Non-residential trade waste charges

Trade waste charges are levied on industrial and commercial customers whose discharge to the wastewater system is more highly contaminated than regular domestic sewage. Sydney Water has approximately 24,000 commercial and 720 industrial trade waste customers.[74]

Sydney Water currently levies three types of trade waste charges:

- **Pollutant charges**, which recover the costs of the transport, treatment and disposal of trade waste, as well as the corrosion caused by high strength waste.
- **Ancillary and agreement charges**, which recover the cost of administering trade waste agreements and conducting inspections.
- **Wastesafe charges**, which recover the cost of monitoring liquid waste pits.

Further information explaining Sydney Water's trade waste pollutant charges is outlined in Appendix M.

We made a draft decision:

44 To set the maximum trade waste prices as listed in Appendix M.

Pricing principles

Ancillary and agreement charges are set to recover the costs of services exclusively provided to trade waste services such as inspections and sampling. Pollutant charges are set to recover the portion of total wastewater opex and capex attributable to trade waste discharges.

74 Sydney Water Pricing Proposal, 1 July 2019, Schedule 6, pp 9-10.

We developed pricing principles for assessing trade waste charges for the 2016 determination period (see box below), and we are satisfied that Sydney Water's trade waste pricing method aligns with these principles.

Box 11.1 IPART's trade waste pricing principles

As part of our 2016 Determination we updated our trade waste pricing principles, in particular to clarify that charges should recover all efficient costs, including corporate costs. The application of appropriate pricing principles to trade waste requires that:

- Standards for acceptance should be set on the basis of the capacity of current systems to transport, treat and dispose of the wastes, having regard to the health and safety of wastewater workers.
- Trade waste charges should cover the efficient costs to the water supplier of handling these wastes, including an allocation of corporate overheads.
- Charges should vary to reflect differences in the cost of treating waste to the required standards at particular locations.
- Water suppliers should set charges and standards in a manner that is transparent and accurate. The method of measurement should be reliable and the basis for setting charges should reflect costs incurred as far as possible.

Therefore, we have accepted Sydney Water's revised prices for trade waste charges for the 2020 period, with one exception. Box 11.2 outlines the revisions that Sydney Water has made to its proposed prices, in response to IPART feedback. It also outlines our draft decision to hold the BOD corrosion charge for industrial customers constant in real terms, and apply a 1.1% corporate uplift.

Box 11.2 Sydney Water's revised trade waste prices

Sydney Water has proposed reductions to most commercial and industrial pollutant charges. It has also proposed reductions to commercial agreement charges and Wastesafe charges, but small increases to industrial agreement charges.

It has also proposed eliminating three charges:

- Two "missed Wastesafe service charges" as part of moving to a new approach to managing Wastesafe customers with non-compliant grease traps (see below).
- The "sale of trade waste data" charge which was levied to cover the cost of complex data requests. Sydney Water has not applied this charge in many years. In future, Sydney Water proposes to manage any requests through the "Sydney Water hourly rate" charge in the ancillary services schedule.

Lower pollutant charges for industrial and commercial customers

Pollutant charges allow Sydney Water to recover the variable costs trade waste discharges place on the wastewater system when compared to ordinary wastewater customers. Sydney Water calculates pollutant charges based on the relative load (ie, the mass) of particular pollutants that different types of trade waste customers contribute to wastewater system.

Sydney Water has proposed reducing industrial pollutant charges in 2020-21 by 0.2% to 80% compared to 2019-20 prices. The largest reductions are for Nitrogen and Phosphorous nutrients in secondary catchments.

Sydney Water has proposed reducing commercial pollutant charges by 25% to 43% compared to 2019-20 prices depending on the type of customer, with the largest reductions for food and automotive businesses. Sydney Water has however proposed increasing pollutant charges for food businesses which do not maintain their grease-traps by 7%.

Sydney Water has also proposed to increase prices for two minor industrial pollutant charges: excess pH and temperature in corrosion affected catchments.

Higher fixed charges for industrial customers and lower for commercial customers

Fixed agreement charges and Wastesafe charges allow Sydney Water to recover its fixed costs for providing specific trade waste services such as performing inspections and waste sampling, as well as administering trade waste agreements.

Sydney Water proposed a 15% increase in agreement charges for industrial customers; a 36% to 38% reduction in agreement charges for commercial customers; and a 66% reduction in Wastesafe administration charges.

A new pricing method for non-compliant Wastesafe customers

Wastesafe customers (predominately food businesses) are expected to maintain a waste trap (grease trap) consistent with Sydney Water's specifications. Traps require regular pump outs of oils and organic material because if a trap becomes blocked it will significantly increase the amount of pollutant material entering the sewer.

Sydney Water has proposed a new approach for dealing with non-compliance, where instead of a fixed missed service fee, non-compliant customers would be charged the same volumetric pollutant charges as if they did not have a waste trap. Therefore, the pollutant charge for a food business would increase from $1.71 per kilolitre of deemed discharge (or $2.37 for "high-strength" businesses) to $13.01 per kilolitre. The higher rate would apply from the time they were deemed non-compliant until they have their trap serviced. Sydney Water will take steps, including a desktop evaluation, contacting the customer and/or making a site visit, to ensure that customers are not charged the higher price when they are unknowingly uncompliant.

BOD charges to increase by 1.1% per year

We are suitably confident in Sydney Water's modelling to accept Sydney Water's proposed trade waste prices, with the exception of Sydney Water's proposed BOD corrosion charge for industrial customers. Sydney Water's initial modelling for the BOD charge was a "bolt on" to its pollutant model with numerous errors. Sydney Water subsequently submitted a new method for estimating these costs however we remained sceptical of many of the inputs. We have instead recommended holding this charge constant in real terms and increasing it by 1.1% per year to reflect corporate costs.

Sydney Water needs to refine its model in the future

In reviewing Sydney Water's model we generally considered its approach was reasonable although we identified a number of areas where Sydney Water should look to improve its model in the future. These included:

- Determining if it is appropriate to allocate charges between pollutants on a mass basis, given the relative contribution of different pollutants to Sydney Water's costs is unlikely to be the same (ie, it may cost more to treat a kilogram of phosphorous than a kilogram of suspended solids).
- Developing a more rigorous approach to calculating industrial corrosion charges.
- Investigating to what extent trade waste customers are a driver of future capital expenditure, compared to other wastewater customers, to determine whether there is a benefit in providing a long run price signal for trade waste customers.
- Calculating how much revenue Sydney Water collects from non-compliant Wastesafe customers based on actual data.

Our draft decision would set trade waste charges for almost all customers lower than the current determination. Most commercial and industrial pollutant charges are lower, and three charges will be eliminated (two Wastesafe missed service charges and the sale of trade waste data charge).

The only customers which would see bill increases would be some customers with non-compliant waste traps. This is because the Wastesafe missed service charges will be replaced by a higher charge for non-complying customers. This would encourage compliance among these customers, and also reflects the costs to Sydney Water in addressing non-compliance.

The full list of trade waste prices is outlined in Appendix M.

Trade waste revenue

Trade waste makes up a very small portion of Sydney Water's total revenue (0.9%).[75] We deduct the trade waste revenue from the notional revenue requirement, before setting wastewater prices for the general customer base.

Sydney Water estimates that trade waste revenue for 2019-20 is $33.0 million, and this will drop to $24.6 million across the 2020 Price Determination due to the reduced Industrial and Commercial Pollutant charges. We have accepted Sydney Water's forecasts, as they are reasonable given the lower prices.

11.2 Miscellaneous and ancillary charges

Sydney Water levies miscellaneous and ancillary service charges for a number of non-contestable one-off services. These charges account for a small proportion of Sydney Water's total revenue – approximately 0.5%.[76]

We made a draft decision:

45 To set the maximum prices for miscellaneous and ancillary services to apply from 1 July 2020 as set out in Appendix N.

Reasons for our decision

We have accepted Sydney Water's proposed prices for miscellaneous and ancillary prices, including a proposed 1.1% annual increase to allocate corporate costs to these services.

Sydney Water has 34 Miscellaneous and Ancillary charges. It has proposed:

- Price decreases for 13 charges, with decreases ranging from $0.09 to $891.40 per charge. The reduction in charges was mainly due to a reduction in contractor's costs and fees as well as efficiencies achieved as part of Sydney Water's online portal.
- Price increases for eight charges, with increases ranging from $0.54 to $71.29 per charge. The increases in charges reflect actual contract costs for meter replacements, and changes in Sydney Water's business and operating environment for other charges.
- No change for the other nine charges, except to reflect a 1.1% per annum increase in costs to reflect corporate costs.

The majority of price changes for these services are relatively small, particularly in absolute dollar terms, and these fees are generally for one-off services.

For the eight services where Sydney Water has proposed a price increase, we compared Sydney Water's proposed prices to the Central Coast Council's current prices, and the draft prices we have set for Hunter Water. We found that Sydney Water's prices were generally set consistently with the other two utilities. The only exception is Sydney Water's proposed price for water service connections for large meters. However, we have accepted this price, on the

[75] Sydney Water Pricing Proposal, 1 July 2019, Schedule 6, pp3.
[76] Sydney Water Pricing Proposal, 1 July 2019, Schedule 7, pp3.

basis that these customers would generally be commercial customers, and that the price should be set to reflect Sydney Water's actual costs of providing the service.

Sydney Water also proposed adding one new charge – for the annual test of backflow prevention devices. All properties must have a backflow prevention device installed, to ensure that no water – which could be contaminated – can flow back into Sydney Water's mains (for instance in the event of a fall in mains pressure). Properties are classified as either low, medium or high hazard, according to how well the property drains. For low hazard 20mm or 25mm customers, Sydney Water's meters are sufficient backflow protection, but for higher hazard or larger meter properties, separate backflow devices must be installed.

All backflow devices have to be installed by a licenced plumber, and must be tested annually to ensure they remain functional. Sydney Water maintains a register of approximately 31,000 testable devices, of which approximately 6,000 are non-compliant (ie, the property owner has not had the device tested). This represents a risk to the quality of the water supply.

Sydney Water has proposed a new ancillary charge for the annual testing of these devices. The charge would cover a Sydney Water contractor visiting the property, conducting the annual test of the backflow device, and lodging the test report. The fee ($229.44) would be levied only on non-complying customers.

We have accepted Sydney Water's proposed charge, as this fee is only levied on non-compliant customers.

11.3 Dishonoured or declined payment and late payment fees

Sydney Water has proposed to slightly increase its late and dishonoured or declined payment fees, to reflect a proposed 1.1% annual increase to allocate corporate costs to these fees.

We made draft decisions:

46 To set the maximum price for late payments as set out in Table 11.1.

47 To set the maximum price for dishonoured or declined payments as set out in Table 11.1.

Table 11.1 Draft prices for late payment, and declined payment fees

Charge	2019-20	2020-21	2021-22	2022-23	2023-24
Late payment fee	4.74	4.75	4.80	4.85	4.90
Dishonoured or declined payment fee	14.26	14.30	14.46	14.62	14.78

Reasons for our decision

Sydney Water's Customer Contract states that it may charge customers, the higher of:

- the interest on their overdue account balance, or
- a late payment fee, but only if the maximum late payment fee is specified by IPART as part of a review conducted under the Independent Pricing and Regulatory Tribunal Act 1992 (NSW).

Under the Customer Contract, if the customer's payment of the bill is dishonoured or declined, Sydney Water may charge a dishonoured or declined payment fee.

Sydney Water has indicated that these late payments increase its costs, including for: printing and posting reminder bills and overdue notices; phone calls and other follow up actions; and the funding cost that comes from the delay in receiving revenue. Sydney Water applies the higher of a late payment fee, or interest accrued to the overdue bill, to recover these costs.

We received a submission from PIAC questioning the necessity of these fees, noting that late or declined payments are often a result of socioeconomic disadvantage, and suggesting that the impact on the customers is far greater than the impact on Sydney Water. However, Sydney Water has provided evidence that there are a significant number of customers who have not paid their bills by the due date (30%), and that around 15% are significantly overdue, many of whom are not in financial hardship.[77] It estimates around 250,000 instances of late payment and 275 instances of dishonoured or declined payment in 2020-21, which may remain steady over the four-year price path.

Under its Customer Contract, Sydney Water can only charge in accordance with any terms and conditions specified by IPART. These conditions provide safeguards for vulnerable customers and address the risk that customers experiencing financial hardship will be negatively impacted.

IPART conducted a detailed review of Sydney Water's late payment fee during the 2016 price review. The fee reflected the combined interest and debt recovery costs across a range of different customer situations. We determined that Sydney Water's proposed fee was reasonable, simple to understand, and below that charged by other service providers (see Table 11.2).

Table 11.2 Comparison of late payment fees charged by other service providers

Company	Late payment fee
AGL – electricity	$12.73 (not subject to GST)
AGL – gas	$12.73 (not subject to GST)
Origin/Integral	$10.90 (not subject to GST)
Energy Australia	$12.00 for market retail contracts (excludes customers on Flexi Saver and Secure Saver energy plans)
Optus	$15.00 (no GST applies) If the bill is more than $50 and the total amount owing is not paid the due date.
Telstra	$15.00 for overdue amounts more than $70

Source: Sydney Water pricing proposal to IPART, June 2019, Appendix 4B, p 3.

Our draft decision is to accept Sydney Water's proposal, as it has proposed to largely maintain these fees, with the exception of applying a uplift to allocate corporate costs to these fees.

[77] Sydney Water pricing proposal to IPART, June 2019, Appendix 4B, p 2.

11.4 Unfiltered water charges

Unfiltered water is water that has chemical treatment, but not at a water filtration plant. The unfiltered water charge is currently set at a small discount to the treated water usage price, to reflect the reduced water filtration costs incurred by Sydney Water.

Currently, Bluescope Steel's Port Kembla plant in Wollongong is Sydney Water's only unfiltered water customer.[78]

We made draft decisions:

48 To set the maximum unfiltered usage charge at $0.30/kL less than the usage charge for potable water.

Reasons for our decision

Our draft decision is broadly cost-reflective and is in line with Sydney Water's proposal. The average forecast filtration cost for the 2020 Determination period is $0.30/kL, only marginally lower than the projected discount price of $0.33/kL for 2019-20.

The current structure of unfiltered water charges will remain, which includes a fixed service charge set at the same level as the charge for potable water (based on meter size).

11.5 Unmetered water charges

Some residential and non-residential properties do not have water meters, meaning they do not pay explicit water usage charges. Instead, they pay for water usage based on a deemed allowance which is added to their fixed water service charge. Sydney Water data shows there are approximately unmetered 14,000 customers.[79]

We made a draft decision:

49 To maintain current approach to charging unmetered properties, which includes:

- A water service charge equal to the residential service charge, and
- 180 kL of deemed water usage per year (ie, 180 kL *times* the water usage price).

50 That when a property is temporarily unmetered, for the unmetered period it should be charged:

– A water service charge equal to the residential service charge, plus

– The water usage price applied to the average daily usage over the previous twelve months, specific to that property, multiplied by the number of days that the property is unmetered, or

– Zero if average daily usage data is unavailable.

[78] Sydney Water pricing proposal to IPART, June 2019, Attachment 4, pp14.
[79] Sydney Water pricing proposal to IPART, June 2019, Attachment 4, pp15.

Reasons for our decision

Our draft decision is consistent with Sydney Water's proposal. We consider that unmetered customers should continue to pay a water service charge that reflects the residential service charge.

Our view is that it is appropriate to include a deemed usage component for unmetered customers, as this accords with the impactor pays principle. We consider that 180 kL of deemed usage (slightly above average apartment usage, but below average residential consumption) is appropriate given that 80% of unmetered customers are either small inner-city terraces or small non-residential shops.[80] We note that customers are at liberty to have a meter installed if they believe they are consuming less than the deemed amount. Sydney Water will provide the meter free of charge, and the customer is responsible for the cost of installation.

Sydney Water's response to our Issues Paper provided justification for the continuation of a 180 kL deemed usage. It maintains that since its 2012 review of water use for unmetered properties, the total number of unmetered properties continues to decline. Sydney Water states the number of unmetered non-residential properties has significantly reduced, by over 50% since 2012. Therefore, it does not consider that the administrative cost to increase deemed usage charges is warranted for this review, given its view that the type of unmetered residential properties and their consumption habits have not changed.

Our draft decision is to accept this reasoning and maintain the deemed water usage charge for unmetered properties at 180 kL per year.

Sydney Water did not specifically address how prices should be set for temporarily unmetered properties in its proposal. We have decided to charge these properties based on their historical water usage. That is, unmetered properties would be charged a water usage price applied to the average daily usage over the previous twelve months, specific to that property, multiplied by the number of days the property is unmetered. This is in line with our decision in our 2019 Central Coast review.[81]

11.6 Sydney Water Developer Direct

During this review, we examined the services offered through Sydney Water Developer Direct (SWDD). Sydney Water currently competes with private sector Water Servicing Co-ordinators (WSCs) to provide application and construction services for some smaller customers, to ensure that new development is adequately serviced with water, wastewater and stormwater services. Box 11.3 provides a background of the market, and the services that Sydney Water currently offers through SWDD.

Our draft finding is that SWDD should revisit its model for pricing application services, to address concerns identified by our consultants, Cardno. We have also made a draft decision to continue to defer regulating construction services offered by SWDD because these services are outsourced by SWDD, and we consider that the margin applied by SWDD is reasonable.

[80] Sydney Water submission to IPART Issues Paper, October 2015, p 105.
[81] IPART 2019, *Review of Central Coast Council's water, sewerage and stormwater prices*,p 16.

Box 11.3 Certifying that new developments are fit to be part of Sydney Water's network

Developers must acquire a Section 73 Compliance Certificate (s73 Certificate) from Sydney Water to certify that a new development has satisfied all of its requirements relating to the availability of drinking water, wastewater, recycled water or stormwater services for that development.[82]

Sydney Water provided these services until 2001, after which it exited the market as it considered that the work could be better provided by the broader market. This resulted in the establishment of a Water Servicing Coordinator (WSC) market. WSCs act as a point of contact between Sydney Water and the developer. They advise and assist customers on how to meet the requirements to obtain a s73 Certificate, prepare design sketches and seek quotes from construction services providers for any necessary works. These services broadly fall under the umbrella of 'application services'. Some WSC's also provide construction services, which may include detailed design work, project management, engaging constructors to build works, or utilising their own construction teams.

The WSC model has attracted complaints from customers relating to prices and quality of service. Sydney Water has engaged with WSCs in an attempt to address these issues. Specifically, Sydney Water:

- Now requires all WSCs to integrate coordination and design services where they used to be completed by separate teams. This overcomes an issue whereby WSCs could avoid responsibility for errors by each blaming the other team.
- Has refreshed its procurement arrangements to provide greater certainty and encourage collaboration with WSCs.
- Has introduced 'Accreditation Categories' to strengthen the WSC scheme. There are 17 categories which cover different services, sizes of infrastructure and roles. This ensures that work is only completed by WSCs that have sufficient knowledge and experience to complete works to a high standard.

Alongside these improvements, Sydney Water launched SWDD in July 2017 in response to customer feedback about the WSC market. SWDD provides the following services:

- Application services for developments requiring only 'minor works', or no works. For these types of developments, developers can now choose whether to engage a WSC or to use SWDD for application services. For developments requiring major works, Sydney Water still requires developers to engage a WSC. The services provided by SWDD, as listed on the Sydney Water website, include:
  - Assessment of building plans and development applications
  - Notice of Requirements if there is a need for works
  - A quote for any construction work outlined in the Notice of Requirements
  - Section 73 Certificate and full Building Plan Approval, once the developer has met all of Sydney Water's requirements.
- Various construction services, including:
  - new private main to meter connections for water, wastewater and recycled water
  - capping an existing connection, and
  - asset protection slabs and concrete easements.

Stakeholders raised concerns with SWDD

We received a number of submissions in response to our Issues Paper regarding SWDD. These submissions varied in their complaints, but largely followed the same themes that SWDD has an unfair advantage in the market as a result of:

- Information asymmetries – for instance, Sydney Water appears to promote SWDD services on its website over WSCs
- Different compliance requirements – for instance, software required for sketches, and fees for sewer service diagrams appear different between WSCs and SWDD
- As such, submissions claimed that SWDD prices are not in line with market rates: that SWDD undercharges for application services and then overcharges for construction services. While it outsources construction services, submissions suggested that it was not possible for WSCs to join SWDD's panel, and that they were locked out of that construction work.

We engaged a consultant to review SWDD

In our 2018 Developer Charges review we received submissions that SWDD was using its market power to undercut WSCs' prices. We consulted directly with WSCs and assessed SWDD services.

At that stage we deferred judgement until this review. However, we have now received more submissions, and decided to undertake a full scale review.

We engaged Cardno to review of SWDD. In particular, they examined whether Sydney Water is using vertical integration to undercut application services offered by WSCs or cross-subsidising its application and construction services.

Cardno's main findings were that:[83]

- Sydney Water has **appropriately ring-fenced** all SWDD costs, with one exception where there is no formal agreement between Sydney Water and SWDD for sharing software costs.
- The **information asymmetries** noted in submissions are, on the whole, a result of **misunderstanding** rather than an intentional unfair treatment of WSCs.
- SWDD is **not intentionally acting in an uncompetitive way**, however there are two places where it has unintentionally created an uneven playing field.
- SWDD is, in some cases, subject to **different requirements** to WSCs. Specifically, there are minor inconsistencies in their requirement for Engineering Competency Standards accreditation, and in contractual requirements with Sydney Water. These differences could result in a minor cost advantage for SWDD, though this would not be significant.

[82] Sydney Water's submission to IPART Issues Paper, December 2017, p 39.
[83] Cardno's report can be found on our website.

- SWDD is not currently earning a **commercial rate of return** on its services. SWDD uses a cost build-up approach to calculate its fixed price for application services, and Cardno found a number of issues with the approach. Specifically, it notes that the number of applications assumed each month is not historically accurate, and that SWDD staff utilisation rates are not accurate. Taking this into account, Cardno believes application prices should be higher.

To address these concerns, Cardno recommended that Sydney Water review its pricing model to account for the errors identified in the model, and that it ensure that SWDD requirements are pulled in to line with those required of WSCs.

We recommend that SWDD revisit its model for pricing application services

We agree with the findings of Cardno, and recommend that Sydney Water review SWDD and provide its response to our recommendations as part of its response to this Draft Report.

We recommend:

1 That Sydney Water:

- Review the Engineering Competency Requirements and require SWDD to meet the same standards as WSCs
- Review its quality management system and provide evidence that it satisfies the same criteria applied to prospective WSCs through the tender process.
- Revisit its assumptions for the allocation of staff time to SWDD activities and increase the utilisation rate it applies to the cost build-up.
- Formalise a level of service agreement between itself and SWDD for the provision of the SWDD software.
- Adjust the SWDD pricing model to base pricing on a rolling average number of applications as opposed to an anticipated flat rate.

We made a draft decision:

51 To defer regulation of SWDD construction services.

In providing feedback to a draft report by Cardno, Sydney Water has indicated it is willing to work with IPART to implement these changes, and as such we consider this is the fastest and lowest cost approach to rectifying this issue. However, should any party continue to be concerned, there is an established process to lodge a competitive neutrality complaint. More information about this process can be found on our website.

12 Form of regulation

This chapter discusses the 'form of regulation', or the set of methods we use to regulate prices for the utility's monopoly services. The form of regulation can determine how risk is allocated amongst the regulated utility, its customers and taxpayers, and includes:

- How long we set prices for before our next review
- Whether prices are directly or indirectly controlled
- How we can incentivise the utility to improve its performance
- How revenue and cost risks are shared between the utility and its customers.

In the 2016 Sydney Water review, we introduced two new mechanisms to encourage it to become more efficient and provide more flexibility to better respond to customers' preferences and behaviour. These mechanisms were:

- The efficiency carryover mechanism (ECM), and
- The option for unregulated pricing agreements (UPAs).

This chapter also assesses these mechanisms over the 2016 determination period, and whether to apply them for the next price path.

12.1 A 4-year determination period

For each water pricing review, we decide how long to set prices for (the length of the determination period). In general, the determination period can be between one and five years, depending on the circumstances. In Appendix B (Box B.4) we list the matters we consider when we set the determination length.

We made a draft decision:

52 To set a 4-year determination period.

Our draft decision is to set prices from 1 July 2020 for four years, as we consider this appropriately balances a range of matters – including incentives for efficiency gains, minimising regulatory costs, and risks of inaccurate forecasts. This is the same as Sydney Water's proposal, and Hunter Water's revised proposal. PIAC, in its submission to our Issues Paper, also supported a four year period.

While we view the length of the determination period as an open question in future reviews, for the current review, the forecasting uncertainty of the utility's costs and demand (especially given the recent climate variability and high levels of capital expenditure) makes a 4-year price path more appropriate than a 5-year determination.

12.2 We will maintain setting a price cap

Our draft decision is to maintain our approach to set a maximum price cap for Sydney Water. Compared to alternatives such as a revenue cap or weighted average price cap, we consider price caps provide transparency and pricing certainty to customers and ensure that, as much as practical, prices reflect efficient costs, and where appropriate, signal the long-run cost of providing the service.

We note that price caps relative to other options (such as a revenue cap) expose the utility to revenue volatility risk and to manage this we have previously introduced a revenue volatility adjustment mechanism. Further is discussed in Chapter 6.

Our approach is supported by Sydney Water for this determination period. No other stakeholders raised alternative forms of regulation.

We made a draft decision:

53 To set a maximum price cap.

12.3 We will retain the current efficiency carryover mechanism

In 2016, we introduced an efficiency carryover mechanism (ECM) for operating expenditure, which allows a utility to retain permanent efficiency savings for a fixed period regardless of when in the determination period they are achieved.

As outlined in Box 12.1, this mechanism aims to remove the incentive for a utility to delay efficiency savings from the end of one determination period to the beginning of the next. The ECM currently applies to the utility's controllable operating expenditure only, and our decision is to maintain the current arrangement.

To date, we have not applied the mechanism in practice – it was available for Sydney Water, Sydney Water and WaterNSW[84] but none of the utilities made a claim under the mechanism for this price review.

We made a draft decision:

54 To maintain the efficiency carry-over mechanism for operating expenditure for the 2020 determination period.

84 IPART, *Review of prices for Hunter Water Corporation From 1 July 2016 to 30 June 2020 Final Report*, June 2016, p13-14, and IPART, *Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020 Final Report*, June 2016, p16.

Box 12.1 The benefits of an Efficiency Carryover Mechanism

An Efficiency Carryover Mechanism (ECM) mitigates the incentive for a regulated utility to delay reporting efficiency savings. This is because any permanent cost savings retained by the business for the current period will be passed onto customers through lower prices at the next price determination regardless of when these savings are identified within the regulatory period.

Without this, utilities could be incentivised to delay implementing efficiencies. Under our pricing framework, we set maximum prices for the regulatory period based on our assessment of the business' efficient costs, and if the business can deliver its services at a lower cost, then it retains the benefits until we reassess its costs at the next price review. This is 'incentive regulation' because it rewards the utility for finding efficiencies, which, if permanent, are passed on to customers in the next pricing period. However, the financial reward to the utility is highest in the first year (as this means the reward is collected in each year of the determination) and deteriorates over the regulatory period, hence providing an incentive to delay efficiencies to the start of the following determination period.

For an ECM to apply:

1. The regulated utility will need to include details of efficiency savings in its next pricing submission, and be able to demonstrate these are permanent efficiency improvements.
2. IPART will then assess the efficiency gain and the appropriate level of funds to be carried forward.

Applying the ECM

If the utility decides to apply the ECM, the utility would need to calculate the following values:

- **Under (over):** first the utility identifies the difference between the base allowance set by IPART to its actual expenditure.
- **Outperformance:** second, the utility only reports where it underspends against our allowances (overspends are omitted).
- **Permanent gain:** working backwards from year 4 to year 1, the utility then determines how much of the outperformance in year 4 also occurred in year 3, how much of the outperformance that occurred in both year 4 and 3 occurred in year 2, etc.
- **Incremental gain:** working forwards from year 1 to 4, it then determines the first year that a permanent saving occurred. It is this 'incremental gain' in each year that would be carried forward for four years through the ECM calculation that follows.
- **ECM calculations:** ensures that any incremental gain is carried forward and held for four years.

At the next determination period, we would consider these calculations, and decide whether the savings identified by the utility are permanent.

For Further information, please see our 2016 Sydney Water Final Report.

The ECM only applies to controllable operating expenditure

As noted, the ECM applies to operating expenditure only – it does not apply to **capital expenditure**.[85] In our 2016 Final Report, we did acknowledge the potential value in encouraging efficient trade-offs between operating and capital expenditure, and that this issue could be explored further in the future.[86] In the lead up to this review, we asked the utilities whether the ECM should be extended to include capital expenditure.

The utilities expressed mixed views on an ECM for capital expenditure

Neither Hunter Water nor WaterNSW proposed broadening the ECM. WaterNSW considers that a capital incentive scheme (either ECM or another) would not result in improved outcomes for the business and customers; the lumpy nature of capital expenditure can be related to different stages of the asset life-cycle, business decisions and planning, and/or government-directed investment, rather than efficiency.

On the other hand, Sydney Water indicated interest in exploring an ECM for capital expenditure and re-iterated its proposal from 2016.

We maintain our views outlined in our 2016 price reviews, which are:

- To limit the ECM on operating costs only because:
  - The risks of unintended consequences associated with strengthening capital expenditure incentives (such as to over-forecast and inefficiently defer capital expenditure).
  - The additional complexity, such as the practicality of undertaking an ex-post assessment of capital expenditure, and the nuances of achieving equalised incentives across operating and capital expenditure.
- Our ECM is asymmetric in the sense that while it equalises the incentive to achieve permanent efficiency savings over time, it preserves all other features of the current form of regulation. That is:
  - Permanent cost increases are held by the business until the next price review, when they are assessed by the regulator and, if determined to be efficient, passed on to customers (through price increases as a result of an increase in the business's operating expenditure allowance) – this provides an incentive for the business to avoid inefficient increases in costs.
  - Temporary over and under spends are retained by the business – this provides an incentive for the business to manage within its budget.

We have received no other stakeholder comments on the ECM.

85 This was due to the additional complexity of introducing an ECM for capital expenditure, the risk of unintended consequences (ie, incentivising the business to over-forecast and inefficiently defer capital expenditure), and the limited opportunities for efficient trade-offs between operating and capital expenditure.

86 Further information on the ECM is available in Chapter 3 and Appendix E in the 2016 Final Report of our determination of Sydney Water's prices. IPART, *Sydney Water Corporation: Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016*, Final Report, June 2016.

12.4 We will retain the option for unregulated pricing agreements

Our current form of regulation involves setting maximum prices for regulated services that apply to all customers for each year of the determination period. In our 2016 review, we decided to allow Sydney Water to enter into unregulated pricing agreements (UPAs) with large non-residential customers, provided the costs and revenues of these unregulated agreements were ring-fenced from the regulated cost base.

As yet, Sydney Water has not entered into any UPAs. At a high level, Sydney Water supports maintaining the flexibility of UPAs, and the Property Council of Australia was the only stakeholder to comment on UPAs in response to our Sydney Water Issues paper, expressing support for the option.

Sydney Water considers a barrier to uptake is the potential for a future Tribunal to remove the option of UPAs and possibly stranding investments with a cost recovery period of greater than the determination period for large customers. Our view is that incentives generated from UPAs should be maintained over time, so we will allow any gains, in the form of increased revenue or decreased costs, to be retained by the parties involved. However, while we view it as unlikely that the option of entering into UPAs will be removed, we cannot bind the decisions of a future Tribunal.

In its response to our Issues Paper, Sydney Water suggested two potential ways to address these barriers:

- Consider seeking approval from the NSW Treasurer to set prices for UPAs, which are not equal to the maximum prices set by IPART, for the tenure of any mutual agreement.
- Consider a price formula for UPAs.

These approaches would apply to existing agreements prior to a future Tribunal making the decision to remove the option of future UPAs, and they would only apply for the remaining tenure established in any commercial agreement. Sydney Water notes that these approaches may be administratively costly, meaning regulatory requirements may be prohibiting a more economically efficient outcome for customers.

The utilities already have the ability to seek approval from the NSW Treasurer to levy prices below those set by IPART. Regarding setting a price formula for UPAs, Sydney Water has not included sufficient detail on this approach for IPART to consider. And, given that UPAs are designed to encourage negotiations between the utility and large customers with potentially unique costs of service and/or service level requirements, it is likely that any pricing formula would vary on a case-by-case basis. Even if we set a pricing formula for UPAs, this still would not bind a future Tribunal or guarantee that an agreement may not be overruled.

We made a draft decision:

55 To maintain an option to enter unregulated pricing agreements with large non-residential customers (defined as those with annual water consumption greater than 7.3 ML).

Our 2016 Determination defines the customers that could enter into a UPA as a non-residential **property** that is serviced by one or more individual meters, where that property has annual

metered water consumption greater than 7.3 ML.[87] We acknowledge that some customers may have multiple properties where, combined, the water usage of the multiple properties would exceed 7.3ML annually, but no individual property would have such great water usage.

We seek feedback on whether this definition should be expanded to include customers with multiple properties. In particular, we would be interested to know whether there are customers that fall into this definition and what impacts might arise from expanding the definition.

IPART seeks comments on the following:

2 Should the definition of large non-residential customers, who are eligible to enter into an unregulated pricing agreement with Sydney Water, be expanded to included customers whose water usage from multiple properties exceeds 7.3ML annually? What are the benefits and risks?

Appendix B contains more information about UPAs.

12.5 Managing contingent project risks

As part of the concurrent review of WaterNSW's bulk water prices to Sydney Water, WaterNSW proposed a number of options to manage its cost risks. Our draft decisions on these options are discussed in detail in Chapter 8 of the WaterNSW Great Sydney Draft Report.

In summary, we outlined a number of options to manage the risk of a contingent project that arises during the Determination period. If the materiality of a contingent project is sufficiently large, the utility can seek a preliminary assessment from IPART on the efficiency of a contingent project that arises during a Determination period, which could provide it with a level of comfort that the capital expenditure will be rolled into the RAB at the next price determination. And if the unanticipated cost impost is large, the utility can also request a resetting of the determination.

We also note that Sydney Water has identified a number of drought risks that could arise in the 2020 Determination period. We have:

- Addressed the additional operating expenditure costs, and the impact of water restrictions on water consumption, during drought, as part of our water usage price uplift.
- Addressed the potential costs that Sydney Water might face from an expansion of SDP, through a cost pass-through to the water service charge.

87 And that property does not receive joint water supply/sewerage services.

13 Output measures

This chapter presents our draft decisions on output measures for the 2020 determination period, and summarises Sydney Water's performance against its 2015 – 2020 IPART Operating Licence requirements and Environment Protection Licences (EPLs) issued by the Environment Protection Authority (EPA).

As with operating and capital expenditure, we engaged Atkins to review Sydney Water's performance against its requirements and to recommend 'output measures' for the 2020 determination period.

We have set a small number of output measures to track Sydney Water's performance in delivering:

- capital expenditure on discretionary and drought-related projects, and
- performance in relation to water conservation, leakage and water recycling. Sydney Water's water conservation and leakage performance is an area where the utility's performance has declined in recent years and there are increased community expectations, particularly given recent drought conditions.

13.1 Our draft decisions

We made draft decisions:

56 To apply the output measures on discretionary and drought-related capital projects detailed in Table 13.1, for reporting to IPART in the pricing proposal for the next Determination.

57 To apply the output measures on water conservation, leakage and water recycling detailed in Table 13.2, for quarterly reporting to IPART.

Our draft decisions are to set output measures to track three key elements of our review of Sydney Water's services:

1. **Discretionary expenditure**. We have set one measure for Sydney Water's two discretionary projects, and a third measure to ensure Sydney Water adequately informs its customers of the discretionary expenditure.
2. **Drought-related expenditure**. We have included one drought-related output measure, to track a network upgrade if the Sydney Desalination Plant (SDP) is expanded, to be publicly reported in Sydney Water's next pricing proposal (July 2024).
3. **Water conservation activities**. We have set five new measures relating to leakage, water recycling and water conservation activities, with quarterly reporting to provide visibility of short-term performance against targets to monitor the success of water conservation activities.

Previously, we set output measures that were focussed more on the 'inputs' used to deliver aspects of Sydney Water's capital program, rather than being outcomes-focused on Sydney Water's performance, or the delivery of key projects. We have removed reporting

requirements for 'business-as-usual' capital programs, because these measures may send the wrong signal to stakeholders about the need to complete a certain quantum of renewals, and they impose a small regulatory burden on the utility.

Table 13.1 Output measures on discretionary and drought-related capital projects

No.	Project description	Measure	Target
1	A discretionary project to divert untreated wastewater ocean outfalls at Vaucluse-Diamond Bay.	The amount of wastewater released from the three outfalls (Vaucluse, Diamond bay 1, and Diamond bay 2) during dry weather.	Zero wastewater released from the three outfalls during dry weather, by 30 June 2024.
2	A discretionary project – Waterway Health Improvement Program (WHIP)[a]	The kilometres of waterway restored to good health and area of native vegetation planting, due to the WHIP.	Report on the kilometres of waterway restored each year to good health and area of native vegetation planting under the WHIP.
3	Informing customers of its delivery of discretionary expenditure, and the bill impact of discretionary expenditure	Evidence of how Sydney Water has provided this information to its customers.	Sydney Water to propose in response to our Draft Report.
4	A drought related capital project to upgrade the network to enable the expansion of SDP (subject to the Government's decision to expand SDP).	Network upgrades to accommodate SDP expansion.	Project completion within 24 months of Government decision to expand SDP.

a The Waterway Health Improvement Program had four target outcomes. The first outcome was an increased length of waterways in good health. The other three outcome measures included increased native vegetation planting, additional recreational facilities and removal of rubbish and litter.

Table 13.2 Output measures on water conservation

No.	Project description	Measure	Target
1	Water demand management	Report the percentage reduction in demand from a defined base which Sydney Water currently uses, compared with target reductions during periods of water restrictions.	Whilst in drought: meet the demand reduction and water conservation targets as agreed with the NSW Government
2	Water demand management	Report on expenditure for advertising campaigns and water use enforcement[a]	That Sydney Water invests in water demand management activities to a level that is consistent with the value of water.
3	Leakage	The rolling annual average leakage in ML/day at the end of the quarter compared with the Economic Level of Leakage (ELL)	Rolling annual average leakage is at the ELL, within an allowance to reflect the 'band of uncertainty'
4	Leakage	The quarterly average leakage value in ML/d compared with target for the last five years	Leakage is consistent with the ELL
5	Water recycling	The volume of recycled water produced (ML/d) against capacity from each of the S16a plants at Rosehill-Camelia and the St Mary's plant	Increase the utilisation of recycled water at the Rosehill-Camelia plant and achieve average environmental flows at the St Mary's plant of 43.3ML/day.

a Note that Sydney Water already reports on the costs and water saved from its 'Water-fix' and 'Plumb assist' demand management activities annually in its Water Conservation Report. This information would also be provided on a quarterly basis.

13.2 Reasons for our draft decision

13.2.1 Track the delivery of discretionary and drought projects

Our draft decision is to track the discretionary projects being delivered by Sydney Water over the 2020 determination period. This is because the expenditure approved is a new approach, the utility's performance is not tracked through its Operating License as it is not to deliver mandated service requirements, and customers are being asked to pay more for a better service.

Our draft decision is to also track the drought project related to Sydney Water's network upgrade, subject to the Government's decision to upgrade SDP. This is a discrete project being funded as a cost pass-through. We consider there is a benefit in scrutinising whether the additional costs paid by consumers have also been accompanied by the delivery of the project.

13.2.2 Performance on water conservation, leakage and calculating the value of water

Our consultants found that Sydney Water has not been meeting its leakage targets, as detailed in Box 13.1.

Therefore, in addition to the capital expenditure output measures, our expenditure consultants recommended new measures relating to leakage, recycled water and water conservation. We accepted our consultant's recommendations.

As an interim step, we have asked Sydney Water to report on our five recommend output measures in Table 13.2.

In Section 13.3, we outline our proposal that Sydney Water's Reporting Manual, tied to its operating licence, could instead capture information on Sydney Water's water conservation activities.

Box 13.1 Our consultant's findings on Sydney Water's performance

Performance against IPART performance standards

Sydney Water's operating licence 2015-2020 includes performance standards for water quality, systems performance and water conservation. Atkins found Sydney Water's performance against its operating licence requirements to be mixed. In particular, Atkins found that leakage significantly increased over the last three years and is over 20% above Sydney Water's ELL, and Sydney Water did not meet all the requirements of its EPLs.

Performance on water conservation

Sydney Water's current reporting on water conservation through the Reporting Manual (which accompanies the Operating Licence) does not provide an adequate level of detail to calculate the value of water used by Sydney Water to determine the efficient level of water conservation (ELWC) expenditure. Our current understanding of Sydney Water's calculation of the value of water is detailed in Box 13.2.

Atkins recommend five measures to track quarterly performance. Our draft decision, detailed in Table 13.2, is to accept Atkins recommendation and request Sydney Water provide more information on the method it uses to determine water conservation spending.

Environmental performance

Atkins also found that Sydney Water did not meet all the requirements of its EPLs. A particular area of concern is Sydney Water has not met the EPL requirements for dry weather wastewater overflows. In particular, there have been seven dry weather failures in the last three years, and 15 of 23 systems show deteriorating performance. Further:

- Sydney Water has been subject to increased regulatory oversight by the EPA. The EPA considers that there are systemic shortcomings in Sydney Water's response to dry weather overflows. The EPA has inserted a special clause into Sydney Water's EPLs that requires it to appoint an independent expert to investigate its response.
- Atkins found that there is a need for Sydney Water to increase its activity to address deteriorating performance in the short to medium term, as evidenced by an increase in dry weather overflows to waterways.

Sydney Water's discretionary expenditure projects on waterway health and wastewater outflow seek to improve the utility's environmental performance. In the case of discretionary projects, the utility's performance is not tracked through its Operating Licence or any other regulatory instruments, and as such there is benefit in having output measures on these projects scrutinising whether additional costs paid by consumers have also been accompanied by the delivery of the project.

We, and our consultants, consider that Sydney Water's leakage problem is two-fold:

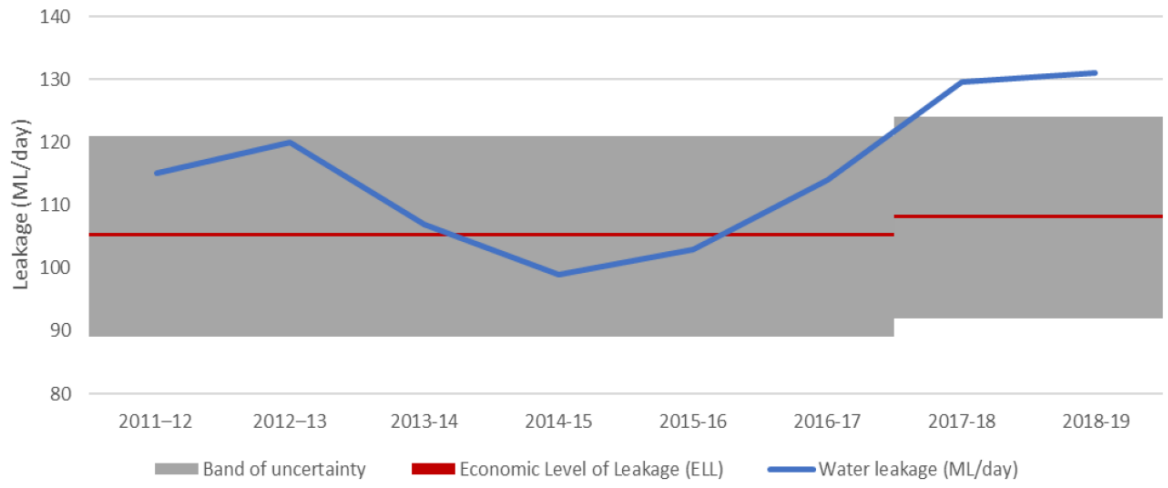
1. Sydney Water is exceeding its ELL. That is, the level of leakage from Sydney Water's network is too high.
2. The efficient level of leakage that Sydney Water has calculated could be too high because Sydney Water's estimate of the value of water may be too low. An explanation of Sydney Water's calculation of the value of water is explained in Box 13.2.

Sydney Water's leakage has been rising for the last four years. This is largely driven by drought conditions leading to more leaks in the system.

In 2018-19 Sydney Water lost an average of 131 ML/day, or 9% of total water supplied, to leakage. For comparison, this is just over half of what the Sydney Desalination Plant generates each day.

This is above the range specified in the ELL (108±16 ML/day). Sydney Water has exceeded the ELL for six out of the last eight years, as detailed in Figure 13.1.

Figure 13.1 Sydney Water actual leakage vs ELL over time



Source: Sydney Water, Water Conservation Report, 2018-19.

In its most recent water conservation report, Sydney Water estimated a short-run value of water of $1.85/kL in early July 2019. This is despite the Sydney region entering Level 1 water restrictions on 1 June 2019.

The short-run value of water is important as it is used by Sydney Water to calculate the suite of water conservation measures for the next five years (2019-20 to 2023-24).

Sydney Water could be undervaluing water, particularly in drought, and therefore underperforming on water conservation and leakage performance. For instance, even just considering the scarcity value component of the calculation, the value of water would have been closer to $4, in July 2019, based on Sydney Water's previous analysis (see Table 13.3).

We therefore seek further information from Sydney Water on how it estimates the ELWC and the ELL.

Table 13.3 Scarcity value of water used in ELWC calculation

Restriction level	Social cost ($/kL)
Water Wise rules	0.00
Level 1	2.31
Level 2	5.79
Level 3	9.38

Source: Sydney Water ELWC Methodology Paper, 2016.

Box 13.2 Sydney Water's value of water calculation and ELWC

The short-run value of water is calculated as follows:

$$Value\ of\ water = Direct\ water\ supply\ cost + Drought\ response + Scarcity\ value + Externalities$$

Sydney Water estimates the value of water for each project based on the length of benefit achieved from water conservation activities. Projects with a life of under five years use the short-run value of water, projects with a life over 20 years use the long-run value, and projects with a life in between use a weighted average of the two. The long-run value is the water usage price set by IPART, on the basis that reflects the long-run marginal cost of supply.

The value of water is a key input into the calculation of the ELWC and ELL.

In order to establish which conservation projects will go ahead each year, Sydney Water calculates the ELWC. The methodology requires Sydney Water to complete water conservation activities up until the point that doing so is more expensive than the value of water saved. A project will go ahead so long as the levelised cost of the project is less than the value of water saved by the project.

$$Project\ levelised\ cost = \frac{PV(Project\ delivery\ cost) - PV(Avoided\ costs) - PV(Externalities)}{PV(Water\ saved)}$$

Leakage performance

Our consultants assessed Sydney Water's performance on leakage with other water utilities.

The Infrastructure Leakage Index (ILI) is an international measure performance indicator of leakage for water utilities.

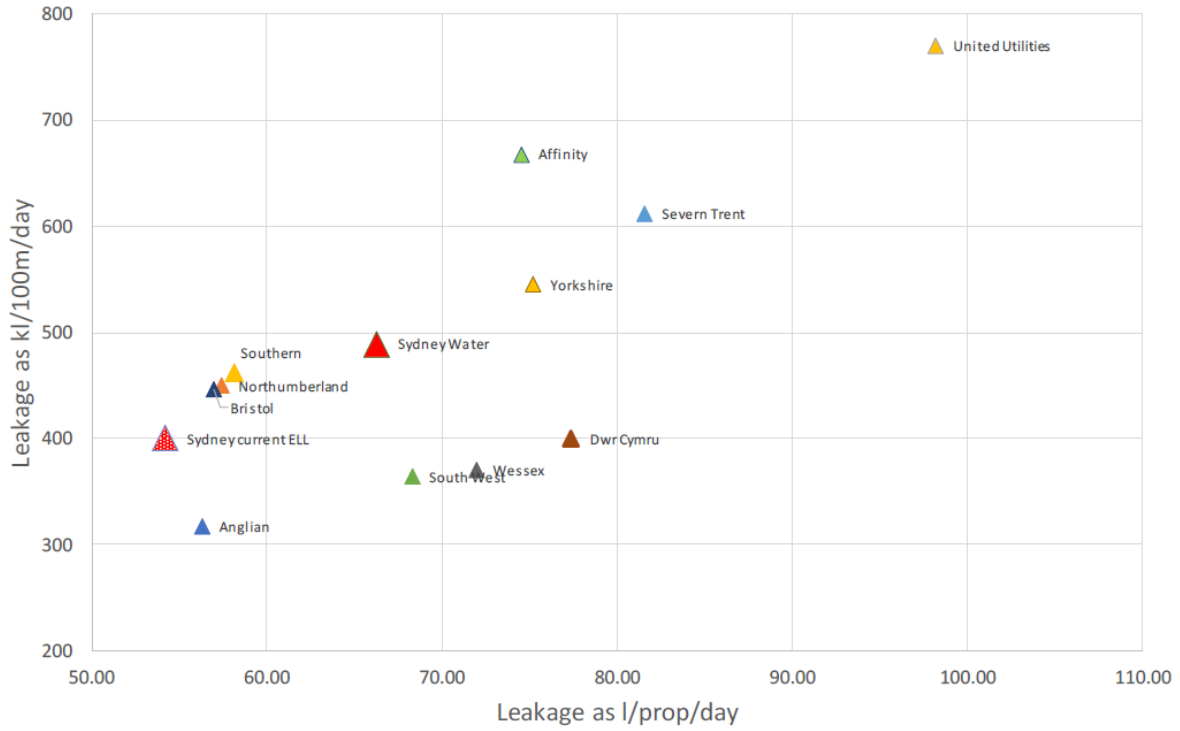
$$ILI = \frac{Current\ Annual\ Real\ Losses}{Unavoidable\ Annual\ Real\ Losses}$$

It aims to measure the ratio of actual leakage (current annual real losses) to a minimum level of unavoidable losses (unavoidable annual real losses). The closer the ratio is to 1, the better the utility is performing.

The index for Sydney Water is 1.63. This is in the top band (less than 2) for developed countries, and according to Sydney Water rates in the top 10% of water utilities globally. By way of comparison, Hunter Water reports its ILI at 1.15.

However, Atkins analysis suggests that Sydney Water may not be in the top 10% based on analysis against water utilities in the UK, but actually more middle of the pack when it comes to leakage (Figure 13.2). Given the recent severity of drought conditions in Sydney, we believe Sydney Water's leakage performance could be better.

Figure 13.2 Comparison of leakage levels across water utilities



Source: Atkins/Cardno, Final Report – Expenditure Review of Sydney Water.

Atkins considers that a contributing factor is that Sydney Water does not have the flow monitoring and leakage detection systems that most other frontier companies normally use. This results in delays in locating leakage at an early stage. Leaks are mainly reported when water has reached the surface, and as a result:

- This has resulted in total leakage being well above the economic level (as specified by Sydney Water).
- Customers are asked to pay for both water lost from the system and the cost of repairs.

Additional expenditure is required to return leakage to its mean economic level. However, according to Atkins, the cost of water lost from the system above the ELL reflects inefficiency in operation, which should not be included within the allowable expenditure allowance.

We agree with our consultants findings.

13.2.3 Revising our existing output measures

In general, we have previously adopted a number of output measures to track the inputs used to deliver business-as-usual expenditure programs (typically asset renewals). The measures, at the most:

- Provide a starting point (or 'peg in the ground') for the ex-post assessment of capital expenditure, and any deviation from targets established for a price review, however the ex-post review seeks significantly more information.
- Can indicate a deficiency in the planning and delivery of capital projects if there are repeated failures to meet output measure targets.

Sydney Water proposed 23[88] capital expenditure output measures for the 2020 determination period, the majority being measures that relate to its ongoing capital programs, and have been carried forward from the 2016 determination period (with revised targets). These are summarised in Appendix F.

However, tracking the inputs used to deliver renewals programs can also send an inefficient signal to utilities and stakeholders that the inputs themselves are the target, rather than the outcomes of the programs. For instance, an 'under-delivery' of the actual input (eg, the number of water mains replaced) against a fixed target does not necessarily mean that the utility has underperformed.[89] This may send the wrong signal to stakeholders about the need to complete a certain quantum of renewals, even though it may no longer be the most efficient use of capital.

Furthermore, the utilities' operating licences mandate minimum levels of performance ('output') and impose reporting obligations against these requirements. Collecting additional information through output measures imposes a regulatory burden on the utility.

Therefore, we have made a draft decision to remove the existing output measures, as we do not consider that these particular measures add to the robustness of our regulatory framework.

13.3 Enhancing Sydney Water's reporting obligations on water conservation in the Reporting Manual

Sydney Water's Operating Licence contains a number of reporting obligations with which Sydney Water must comply. The Reporting Manual outlines all of Sydney Water's reporting requirements under the Licence and, with respect to those requirements, identifies when, what and how Sydney Water is to report information.

Sydney Water's Reporting Manual includes reporting obligations relating to water conservation and planning.[90]

88 At the time of submission, Sydney Water noted that some of their output measures relating to treatment (of wastewater, recycled water treatment, water filtration etc) were subject to change pending any deferral of capital projects from the 2016-20 program, due to risk assessment by management. Since the review, our consultants have recommended to remove these output measures as they have limited value. We agree with our consultants that we don't require these output measures.

89 For example, in the Sydney Water expenditure review, our consultants identified a significant number of output measures were 'under-delivered' in the 2016 determination period, that is the actual outputs were less than the specified 'targets'. However, this 'under delivery' was mostly a result of efficiencies achieved by Sydney Water to deliver the same service level performance at a lower cost.

90 IPART, *Sydney Water Reporting Manual – Operating Licence 2019-2023*, November 2019, Pp 5-6.

The Reporting Manual could be amended:

- To capture more data on Sydney Water's water conservation activities, specifically those measures detailed in Table 13.2, and
- To require Sydney Water to provide more information on the methodology used to determination the ELWC, specifically how the short run value of water estimate published in its Water Conservation Report is derived.

Ofwat (which regulates water utilities in the UK) provides financial incentives and penalties to incentivise leakage performance. By contrast, we provide Sydney Water with efficient funding to manage leakage. However, we are open to considering more explicit financial incentives (similar to Ofwat) for Sydney Water, in addition to increased reporting requirements.

IPART seeks comment on the following:

3 Should Sydney Water be made, through its Reporting Manual, to report publicly on a quarterly basis on the focus areas of leakage performance and water conservation?

4 What alternatives should IPART consider to encourage or require Sydney Water to deliver an efficient level of leakage reduction and water conservation?

14 Impacts of draft prices

This chapter outlines the impact of our pricing decisions on Sydney Water's customers and Sydney Water. We consider the impacts of these decisions on:

- The affordability of water, sewerage and stormwater services for various residential and non-residential customer groups.
- Sydney Water's service standards
- Sydney Water's financeability
- General inflation, and
- The environment

Appendix A further discusses the implications of our pricing decisions on other matters we must consider under Section 15 of the IPART Act. We are satisfied that the 2020 Draft Determination achieves an appropriate balance between these matters.

This chapter presents our findings on bill impacts in terms of nominal dollar impacts – **that is, bill impacts including the impact of forecast inflation**.[91] Further detail on the impacts of our draft prices can be found in Appendix D.

14.1 Impacts on Sydney Water customers

We assessed the bills arising from our recommended prices against current price structures; the prices of other utilities; and as a share of average household income. We compared prices under drought, and non-drought periods, given our draft decision to have a higher water usage price in drought periods.

Our assessment is that our proposed water usage prices are affordable for customers, even in drought conditions. This is summarised in Table 14.1. Customers are also able to estimate what their bill would be with our interactive bill calculator, which is available on our website.

91 We have assumed inflation of 2.5% per year over the 2020 determination period.

Table 14.1: Bill impacts for residential and non-residential customers under IPART's recommended prices

	Residential customers	Non-residential customers
Non-drought prices	Bills would be lower for nearly all households (all households consuming less than around 700kL per year) Bills for a typical pensioner would increase at about the rate of inflation.	Bills would be lower for low and medium users of water, but would be slightly higher for large consumers.
Drought prices	Bills would be lower for lower users of water (those using less than 170kL per year), and would be higher for medium and large users of water. Pensioners would experience a larger bill increase in their bills under drought conditions. This is because pensioners receive a large discount on their fixed service charges, and therefore their bills mostly comprise water usage.	Low-usage *industrial* customers would experience a slight fall in their bills, medium-usage and large-usage customers would experience significant increases in their bills; all *commercial* customers would experience an increase in their bills, with substantial increases for medium-usage and large-usage customers.

Water usage charges would make up a larger share of bills, particularly in drought. This provides customers with more control over their bills, to reduce what they pay by conserving water.

Currently, dam levels are above 80% and the non-drought water usage price would apply from 1 July 2020. This provides households and business an opportunity to prepare for the impact of future drought conditions, before they arrive. Table 14.2 shows the reduction in the water bill of a customer who ordinarily would use 200kL of water each year, if they economise on their water usage, under IPART's recommended price under drought conditions.

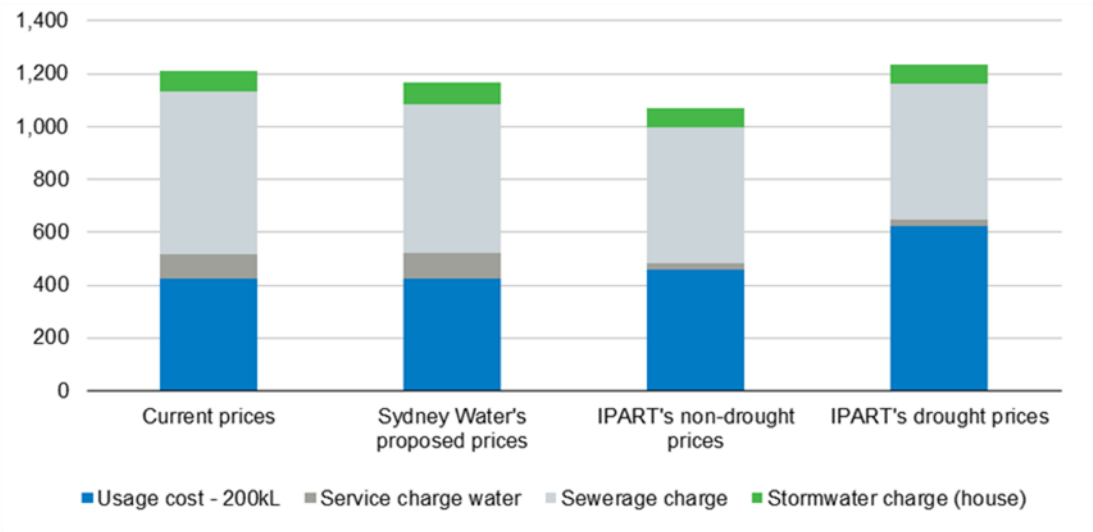
Table 14.2: Water Usage Bills under Sydney Water's proposed and IPART's recommended prices – savings from economising

Water Usage (kL/year)	Water usage bill ($2020-21)		Savings from economising ($2020-21)	
	@ Sydney Water's proposed prices ($2.11/kL)	@ IPART's recommended drought prices ($3.12/kL)	@ Sydney Water's proposed prices	@ IPART's recommended prices
200	422	624	-	-
180	380	562	42	62
160	338	499	84	125
140	295	437	127	187

14.1.1 Residential customers

Figure 14.1 compares bills for a typical household consuming 200kL/year, under both non-drought and drought conditions, to current prices and Sydney Water's proposed non-drought prices.

Figure 14.1 Estimated bills for residential customers using 200kL/year, under various scenarios ($ per annum, 2019-20)



Data source: IPART Secretariat

Looking at the bill impacts for residential households with different levels of water use:

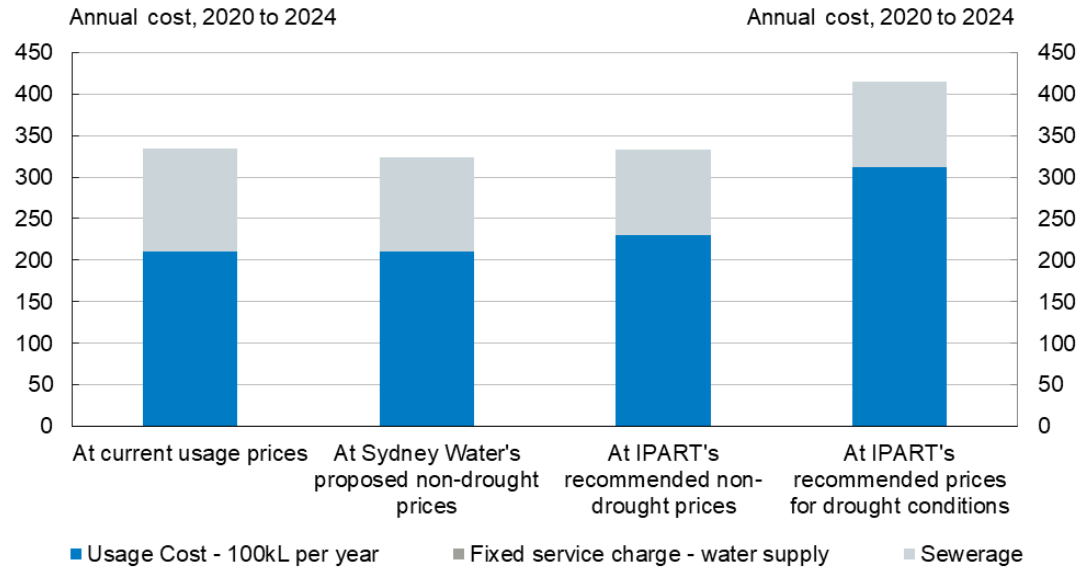
- A residential household consuming 100kL of water per year would receive an annual bill of:
  - $860 per year under non-drought conditions (a 14.1% reduction from current prices), and
  - $944 per year under drought conditions (a 5.8% reduction from current prices).
- A household consuming 200kL of water per year would receive an annual bill of:
  - $1,095 per year under non-drought conditions (a 9.7% reduction from current prices), and
  - $1,262 per year under drought conditions (a 4.1% increase from current prices).
- A household consuming 300kL of water per year would receive an annual bill of:
  - $1,329 per year under non-drought conditions (a 6.6% reduction), and
  - $1,581 per year under drought conditions (an 11.1% increase).

In summary, *in non-drought conditions*, households of all types will benefit from lower bills under IPART's recommended charges, with small users of water realising the greatest percentage cost improvements. In *drought conditions*, water-usage charges rise for large users of water.

Pensioner households

Figure 14.2 compares bills for a typical pensioner household consuming 100kL/year, under both non-drought and drought conditions, to current prices and Sydney Water's proposed non-drought prices.

Figure 14.2 Estimated bills for pensioner customers using 100kL/year, under various scenarios ($ per annum, 2019-20)



Data source: IPART Secretariat

Under non-drought conditions, bills for pensioners would increase at about the rate of inflation. A typical pensioner would receive an annual bill of $353 per year in 2020-21, a $7 or 2% increase from current prices.

Under drought conditions, a typical pensioner would receive an annual bill of $437 per year in 2020-21, a $91 or a 26% increase over current prices. This increase reflects the uplift in the water usage price from $2.30/kL to $3.12/kL in drought.

Sydney Water currently applies a rebate to service prices, calculated as a percentage of the water, wastewater and stormwater service price (Table 14.3).

Table 14.3 How are rebates set for pensioners?

Charge	How is the rebate set?
Water service charge	100% of the quarterly service charge to a maximum of $24.30
Water usage charge	No rebate
Wastewater service charge	80% of the quarterly service charge
Stormwater charge (if applicable)	50% of the quarterly charge

Source: https://www.sydneywater.com.au/SW/accounts-billing/paying-your-bill/pension-rebates/index.htm

We have increased the water usage price, and reduced service prices. With the current way pensioner rebates are set, this means that pensioners benefit relatively less from the reduction

in service prices, and the increase in the water usage price therefore leads to a larger percentage increase in bills.

We have set a higher water usage price in drought to signal the increased costs of water scarcity, which acts as a signal to promote water conservation.

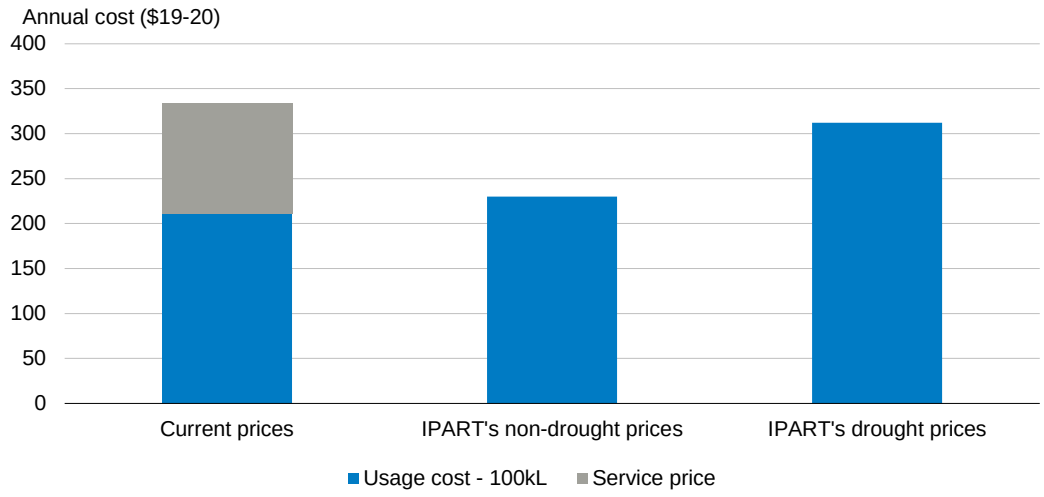
We note that Sydney Water has proposed to pass through all the costs of drought to the water service charge. Thus, pensioners would experience a similarly large bill increase under Sydney Water's proposal. In addition, they would not benefit to the same extent if they reduced their water consumption in drought, compared to our draft prices.

Reviewing how pensioner rebates are set

IPART does not set pensioner rebates; they are separately set by the NSW Government. In light of our draft decisions to increase water usages and reduce service prices, we are keen to work with the Government to review how the rebates are set, for example, to increase the share of service charges that are rebated.

The Government rebate could be restructured so that it covered 100% of water and wastewater service charges. This means that most pensioners would only pay for water usage. In this case, a typical pensioner would see a 7% reduction in their bill during drought – a slightly lower bill impact compared to the wider community (see Figure 14.3).

Figure 14.3 Estimated bills for pensioner customers using 100kL/year, with a restructured pensioner rebate ($ per annum, 2019-20)



Data source: IPART Secretariat

Our estimates suggest if the Government provided a 100% rebate on wastewater service charges, the total amount of pensioner concession funding it provided to Sydney Water would be 5-10% lower compared to the current level of funding provided by the NSW Government.

14.1.2 Non-residential customers

The bill impacts for non-residential customers are more mixed than for residential customers, as they are also influenced by meter-size and discharge factors, in addition to usage patterns.

In general:

- Under non-drought conditions, non-residential users of water, sewerage and stormwater services which use up to around 2,400kL of water per year will see their bills fall, while those using more than this will see some increase in their bills, with the largest increases being experienced by the most intensive users.
- Under drought conditions, non-residential users of water, sewerage and stormwater services which use up to around 180kL of water per year will see their bills fall, while those using more than this will see some increase in their bills, with, again, the largest increases being experienced by the most intensive users.

Our draft prices result in average annual nominal changes ranging from -29% to 7% in non-drought conditions, and from -22% to 35% in drought conditions. In comparison, Sydney Water's proposed prices, on average, result in an annual nominal changes of between -9% for non-residential customers with larger meter sizes and relatively higher water use, and 6.5% for non-residential customers with larger meter sizes and relatively low water use.[92]

In drought, large consumers of water could experience a large increase in prices if they don't conserve water. We consider this increase is appropriate. Firstly, it only applies when water is relatively scarce, and reflects the increased costs of providing water. Secondly, we would expect businesses that are large consumers of water to do what they can to curb their consumption in drought, or face higher bills. The higher water usage price also provides a stronger incentive for these customers to seek out opportunities to use recycled water, where feasible.

Appendix D contains detailed information regarding the bill impacts for various types of residential and non-residential customers under non-drought conditions.

14.1.3 Bills are low compared to those of other utilities

We compared our draft bills for Sydney Water's residential customers to those of fourteen other large metropolitan utilities. The analysis compares total water and wastewater bills for households with 100kL, 200kL and 300kL of annual water consumption. It shows:

- Under non-drought conditions, Sydney Water's bills would be either the lowest, or among the lowest, of the sample of utilities.
- Under drought conditions, Sydney Water's bills would remain low for small consumers of water (100kL per year), and around the median of utilities for households with higher water consumption (200kL or 300kL per year).

92 Excluding the impacts of trade waste charges.

Figure 14.4 Combined water and wastewater bills for households with 100kL of usage

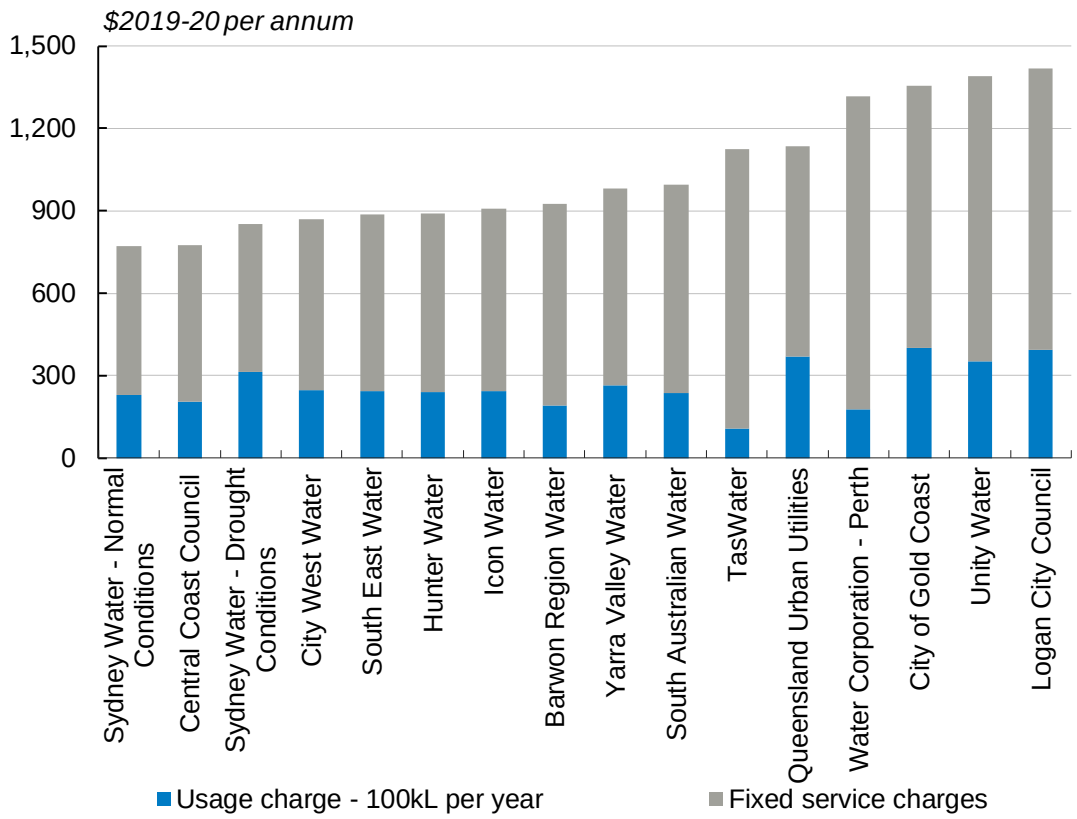


Figure 14.4 shows that under non-drought conditions our proposed bills for a user of 100kL of water per year are the lowest out of the 15 utilities, while under drought conditions our proposed bills for a user of 100kL of water per year are the sixth lowest out of the 15 utilities.

Figure 14.5 Combined water and wastewater bills for households with 200kL of usage

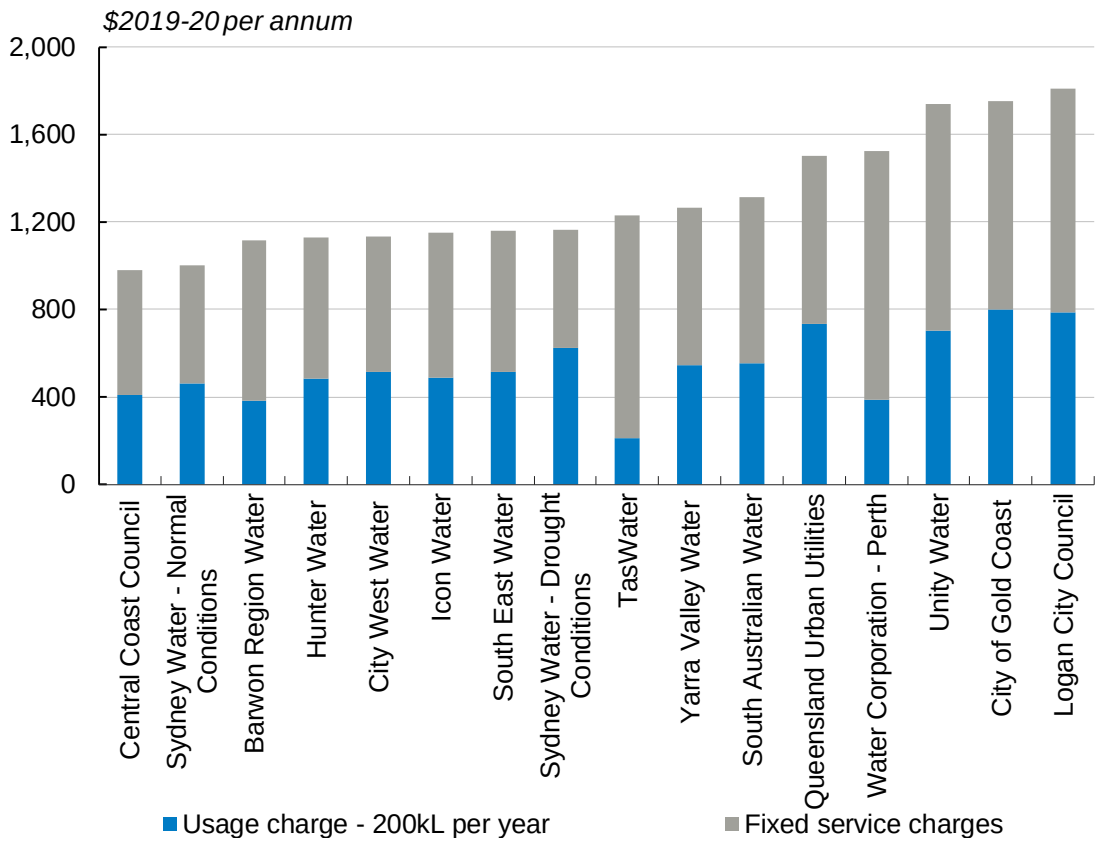


Figure 14.5 shows that under non-drought conditions our proposed bills for a user of 200kL of water per year are the second lowest out of the 15 utilities, while under drought conditions our proposed bills for a user of 200kL of water per year are the ninth lowest, or seventh most expensive.

Figure 14.6 Combined water and wastewater bills for households with 300kL of usage

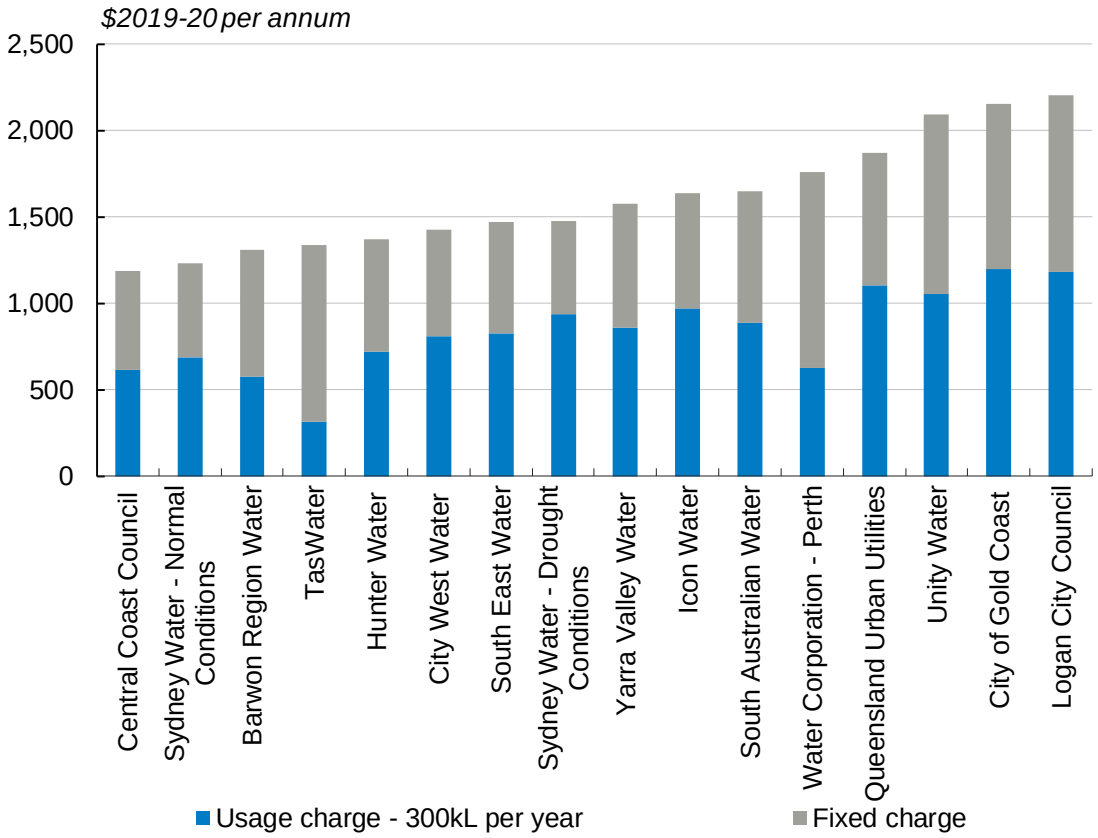


Figure 14.6 shows that under non-drought conditions our proposed bills for a user of 300kL of water per year are the third lowest out of the 15 utilities, while under drought conditions our proposed bills for a user of 300kL of water per year are the eighth lowest of the utilities (the median).

14.1.4 Draft bills are low as a share of customers' income

We compared our draft bill for a typical Sydney Water residential customer consuming 200kL of water per year ($1,095) under non-drought conditions as a share of median household income. This is shown in Table 14.4, with bills as a share of average incomes for customers of Hunter Water and the Central Coast Council shown for comparison. The bill represents 1.2% of median household income in 2020-21.

Table 14.4 Indicative bill estimates as a proportion of median household income

	Average/typical household bill 2019-20	% of household income	Average/typical household bill 2020-21	% of household income
Hunter Water	$ 1,318	2.0%	$ 1,213	1.8%
Central Coast Council	$ 854	1.3%	$ 879	1.3%
Sydney Water[a]				
No drought	$ 1,212	1.3%	$ 1,095	1.2%
Drought	$ 1,212	1.3%	$ 1,262	1.3%

Note: Bills for combined water, wastewater and stormwater services, for a household consuming 200kL of water per year.

Source: ABS 2016 Census QuickStats, our draft prices and bills, 2019 Final Report bill impacts for Central Coast Council, 2020 Draft Report bill impacts for Hunter Water, and IPART analysis.

14.2 Impacts on Sydney Water's financeability

In the November update to its pricing proposal, Sydney Water raised concerns about its financecability if IPART did not accept its proposed additional costs and pass-through mechanisms for drought.

This section:

- Analyses Sydney Water's financeability under our draft decision to reflect the costs of drought through an uplift to the water usage price, and
- Provides some analysis of Sydney Water's financeability calculations.

14.2.1 Sydney Water would not meet all of our financeability targets under our draft prices

We undertake a financeability test to assess how our price decisions are likely to affect Sydney Water's financial sustainability, and ability to raise funds to manage its activities (ie, whether the proposed prices would enable it to raise finance consistent with an investment grade-rated firm), over the upcoming regulatory period. In 2018, we reviewed the financeability test we use as part of our price determination process.

To assess financeability, we look at three indicators in both a benchmark and an actual test:

- Interest coverage ratio
- Funds from operations (FFO) over debt, and
- Gearing.

Our target ratios for the benchmark and actual tests are shown in Table 14.5.

Table 14.5 IPART target ratios for the benchmark and actual test

	Benchmark test (real cost of debt)	Actual test (actual cost of debt)
Interest cover	>2.2x	>1.8x
FFO over debt	>7.0%	>6.0%
Gearing	<70%	<70%

Source: IPART, Review of our financeability test – Final Report, November 2018, p 3.

We undertook through scenarios to assess Sydney Water's financeability. Specifically we calculated the ratios:

- Assuming non-drought conditions with our proposed prices
- Assuming drought conditions with our drought water usage price, and
- Assuming drought conditions with Sydney Water's proposed cost pass throughs.

Tables 14.6-14.8 present the three scenarios, while Box 14.1 clarifies the difference between the two drought scenarios.

Box 14.1 Analysing Sydney Water's financeability under the two drought scenarios

Under both drought scenarios, we have only included the efficient drought costs when calculating financial ratios. Our consultants found that the majority of Sydney Water's drought costs (with the key exception of the Prospect to Macarthur Pipeline) were efficient.

Under Sydney Water's proposed price structures, the additional operating costs are included as a pass-through to the fixed service price in the financial year that they are incurred. Under our price structures, these operating costs are instead included as an uplift to the water usage price as they are incurred. However, for the purposes of calculating the financial ratios, this has no difference on the calculated ratios.

The practical difference between the two scenarios is how the impact of water restrictions on demand affects the financial ratios. Under Sydney Water's pricing proposal, the "lost" revenue from water restrictions would be passed through as an uplift to the water service charge in the following year. In contrast, our approach accounts for reduced water sales on a quarterly basis.

Therefore, the drought financial ratios for our recommended approach are slightly better in the first year of the Determination (2020-21) compared to Sydney Water's proposed price structures.

Overall, the ratios for the three scenarios are broadly consistent. Sydney Water would meet the target ratios for interest cover and gearing. The FFO over debt ratio would be slightly below the target by the end of the 2020 determination period. Importantly, our drought water usage price would result in Sydney Water having marginally better financial ratios than under its proposed cost-pass throughs. This is because the annual adjustment for Demand Volatility would be implemented with a one-year lag under Sydney Water's proposal, whereas our drought water usage price is applied on a quarterly basis.

Our analysis of the FFO over debt ratio

The Real FFO over debt is forecast to slightly underperform against the benchmark target during the regulatory period. However, we do not consider this constitutes a financeability concern.

The financeability metric FFO over debt is designed to test whether a firm generates sufficient free cash flow to repay its debt over the economic life of its assets. For a regulated firm, FFO represents the sum of the depreciation allowance and the after-tax return on equity. Thus it can be influenced by changes to the regulatory asset lives and the permitted return on equity.

Since February 2018 the permitted return on equity for a water business has reduced from 5.95% to 4.95% in real post-tax terms.[93] This change has reduced the real FFO/net debt ratio by approximately 0.7% between 2018 and 2020.[94]

We did not update our financeability target ratios to reflect this change because our targets are general financial market standards and were the subject of consultation during our financeability review. The target ratios make standard underlying assumptions on asset lives and return on equity. Clearly some of those assumptions do not strictly apply to the present water utility price reviews. However, we see value in retaining the standard targets because they are widely used in financial markets and by ratings agencies. When we next review our financeability test we may consider this issue in more detail.

Our building block method of establishing prices ensures that Sydney Water will be able to finance and repay its debt while providing its owners with a market return on equity. The building block method accounts for all cashflows in a more precise and detailed way than the FFO/net debt ratio test does. Therefore, we consider that the FFO/net debt metric does not indicate a problem with Sydney Water's financial sustainability at our draft prices

93 See, for 2018:
https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Regulatory-policy/WACC/Market-Update/Spreadsheet-WACC-Model-February-2018
and, for 2020:
https://www.ipart.nsw.gov.au/Home/Industries/Special-Reviews/Regulatory-policy/WACC/Market-Update/Spreadsheet-Model-WACC-model-February-2020
On the tab "WACC Calculator", set cell C14 to "Water". The current real-post tax cost of equity is in cell C82 and the long term average post-tax cost of equity is in cell D82. The average of these two values for 2018 was 5.95%. For 2020, with the transition to trailing average enabled (cell C41 set to "Yes"), the average of these two values was 4.95%.

94 This finding is based on 60% gearing and an assumption of unchanged asset lives between February 2018 and February 2020.

Table 14.6 Non-drought prices – financeability test results based on our recommended draft prices

Financial year	2019-20	2020-21	2021-22	2022-23	2023-24
Interest cover					
Benchmark test	2.7	4.3	4.2	4.3	4.3
- Does it meet the target?	✓	✓	✓	✓	✓
Actual test	2.8	2.7	2.6	2.7	2.5
- Does it meet the target?	✓	✓	✓	✓	✓
FFO over debt					
Benchmark test	6.8%	6.6%	6.4%	6.6%	6.7%
- Does it meet the target?	×	×	×	×	×
Actual test	6.7%	5.9%	5.6%	5.7%	5.5%
- Does it meet the target?	×	×	×	×	×
Gearing					
Benchmark test	60%	60%	60%	60%	60%
- Does it meet the target?	✓	✓	✓	✓	✓
Actual test	50%	55%	56%	56%	56%
- Does it meet the target?	✓	✓	✓	✓	✓

Source: IPART analysis using our recommended draft NRR and draft prices.

Table 14.7 Drought prices – financeability test results based on our recommended draft prices

Financial year	2019-20	2020-21	2021-22	2022-23	2023-24
Interest cover					
Benchmark test	2.7	**4.3**	4.2	4.3	4.4
- Does it meet the target?	✓	✓	✓	✓	✓
Actual test	2.8	**2.7**	2.6	2.7	2.5
- Does it meet the target?	✓	✓	✓	✓	✓
FFO over debt					
Benchmark test	6.8%	**6.6%**	6.4%	6.6%	6.7%
- Does it meet the target?	×	×	×	×	×
Actual test	6.7%	**5.9%**	5.6%	5.7%	5.6%
- Does it meet the target?	×	×	×	×	×
Gearing					
Benchmark test	60%	60%	60%	60%	60%
- Does it meet the target?	✓	✓	✓	✓	✓
Actual test	50%	55%	56%	56%	56%
- Does it meet the target?	✓	✓	✓	✓	✓

Source: IPART analysis using our recommended draft NRR and draft prices.

Table 14.8 Drought prices – financeability test results based on Sydney Water's proposed drought cost pass-throughs

Financial year	2019-20	2020-21	2021-22	2022-23	2023-24
Interest cover					
Benchmark test	2.7	**3.7**	4.2	4.3	4.3
- Does it meet the target?	✓	✓	✓	✓	✓
Actual test	2.8	**2.5**	2.6	2.7	2.5
- Does it meet the target?	✓	✓	✓	✓	✓
FFO over debt					
Benchmark test	6.8%	**5.4%**	6.4%	6.6%	6.7%
- Does it meet the target?	×	×	×	×	×
Actual test	6.7%	**5.0%**	5.5%	5.7%	5.5%
- Does it meet the target?	×	×	×	×	×
Gearing					
Benchmark test	60%	60%	60%	60%	60%
- Does it meet the target?	✓	✓	✓	✓	✓
Actual test	50%	56%	56%	56%	56%
- Does it meet the target?	✓	✓	✓	✓	✓

Source: IPART analysis using our recommended draft NRR and draft prices.

14.2.2 Sydney Water analysed its financeability

Following the November update to its pricing proposal, where Sydney Water raised concerns about its financecability in drought, we:

- Asked our expenditure review consultants to assess the efficiency of Sydney Water's proposed drought costs, and the impact of water restrictions on water consumption.
- Have made a draft decision to set a higher drought water usage price to address the efficient costs and demand risks of drought on Sydney Water.
- Have made a draft decision to include a contingent cost pass-through mechanism for Sydney Water's capital costs in the event the Government decides to expand SDP.
- Have made a draft decision to maintain our demand volatility adjustment mechanism.

We also met with Sydney Water and requested additional information from the business on its analysis, which was provided in early February. Our assessment of this information is that Sydney Water made some unrealistic assumptions in assessing its financeability under drought, and that even with these assumptions its financial ratios do not indicate a severe financeability concern.

Firstly, its financeability ratios, under a drought scenario, assume a reduction in water sales of up to 39% per year. Specifically, it assumes that we are in **Level 5** water restrictions for 30 months out of the 48 month determination period. And that water restrictions are able to achieve a reduction in demand that is roughly double what was achieved during the Millennium drought.

Therefore, under its proposed pricing framework, Sydney Water's assumed demand reduction alone would result in a $200 uplift to the water service charge for a typical residential customer. We consider allowing the possibility for such a large adjustment to prices in the following year would create bill shock, and strongly prefer the predictability of our recommended drought prices.

Secondly, in some of its scenarios it has simultaneously assumed:

- All of its drought capital and operating expenditure is efficient, but
- IPART would not allow Sydney Water to recover any of these costs.

By design, this creates a shortfall of funding for over $1 billion of capital expenditure, and about $600 million of operating expenditure, over the Determination period.

Our consultants have reviewed Sydney Water's proposed drought costs, and have generally assessed all the drought costs as efficient, with the exception of the Prospect to Macarthur Link (given the recent change in circumstances).

Even under these assumptions, Sydney Water's analysis does not suggest it would experience a severe financeability concern. Over the four-year Determination period, Sydney Water would meet the benchmark and actual target ratios for the Interest Coverage Ratio (ICR) and Gearing Ratio.[95] It would only fail to meet the FFO/debt ratio, missing the targets by a larger degree than under our analysis. And, as discussed in earlier in this chapter, we consider that the FFO over debt metric does not indicate a problem with Sydney Water's financial sustainability at our draft prices.

14.3 Implication for general inflation

Under Section 15 of the IPART Act, we are required to consider the effect of our determinations on general price inflation.

To generate the national consumer price index (CPI), the Australian Bureau of Statistics (ABS) collects data on the capital-city prices of various items of household expenditure, including 'water and sewerage'. The weighting given to water and sewerage in the CPI for Sydney is 0.76 out of 100, meaning that a 1% change in the price of water and sewerage services in Sydney would result in a 0.0076% change in the CPI for Sydney, which is not large.[96]

Further, the water and sewerage measure for the Sydney CPI contributes 24.09% to the national measure of water and sewerage[97], which has a weighting in the national measure of 1.02 out of 100[98]. This means that a 1% change in the price of water and sewerage services in Sydney would result in a 0.0024% change in the national CPI, which is negligible.

95 Technically, under two of its 28 scenarios, Sydney Water would only meet the Interest Coverage Ratio on average over the four years, slightly missing the target in one year out of the four.

96 Australian Bureau of Statistics, *Consumer Price Index 17th Series Weighting Pattern (cat. no.6471.0)*, 6 November 2017; Table 2, CPI weights, September quarter 2017; Utilities, Water and sewerage.

97 Australian Bureau of Statistics, *Consumer Price Index 17th Series Weighting Pattern (cat. no.6471.0)*, 6 November 2017; Table 4, Capital city percentage contribution to the Weighted average of eight capital cities, September quarter 2017; Utilities, Water and sewerage.

98 Australian Bureau of Statistics, *Consumer Price Index 17th Series Weighting Pattern (cat. no.6471.0)*, 6 November 2017; Table 2, CPI weights, September quarter 2017; Utilities, Water and sewerage.

With these weightings in the CPI, it would require an increase in the prices of water, wastewater and stormwater services in Sydney that is much larger than under our draft decisions to have significant impact on either the Sydney CPI or the national CPI.

14.4 Implications for Sydney Water's service standards

Under our Draft Determination, we expect Sydney Water to achieve both operating and capital efficiency savings. We are satisfied that Sydney Water can achieve these savings, and thus generate sufficient revenue to achieve service standards at or above those expected by customers and required under its operating licence.

Sydney Water is licensed under the *Sydney Water Act 1991* (NSW). The Act requires Sydney Water to hold an operating licence that is issued by the Minister and reviewed annually by IPART. This licence contains a number of standards that Sydney Water must meet, or risk facing penalties associated with a breach of licence conditions. Sydney Water's pricing submission identified the expenditure required for it to meet its obligations under both its operating and environmental licences. The operating licence also includes performance indicators against which Sydney Water's performance is reviewed as part of the annual audit of its compliance with the licence.

Compared to 2016 determination period, our draft decisions are to broadly maintain Sydney Water's operating expenditure, excluding the impact of inflation, and to approve a large increase in capital expenditure.

We emphasise that we have made draft decisions to reduce Sydney Water's operating expenditure, based on analysis of Sydney Water's historical and proposed expenditure on water and wastewater maintenance by our consultants – Atkins Cardno. We do not question that Sydney Water needs to improve its recent performance on leakage and dry weather overflows. Rather, we agree with our consultants that some of the increase in expenditure proposed for the 2020 period could have been reduced through more efficient maintenance decisions over the 2016 period. And that customers should not be asked to pay for inefficient maintenance decisions taken over the previous period.

14.5 Implications for the environment

Sydney Water's environmental impacts are regulated by relevant Commonwealth, NSW and local environmental legislation, regulation and regulatory bodies.

For example, DPI Water regulates Sydney Water's extraction of water from the natural environment, and the Environment Protection Authority (EPA) regulates Sydney Water's discharges from its sewage treatment plants and recycling plants and reticulation systems.

Our expenditure review consultants:

- reviewed Sydney Water's performance against the requirements in the Environment Protection Licences (EPLs) issued by the EPA requirements over the 2016 Determination period

- recommended the efficient costs associated with delivering the required EPL outcomes over the 2020 determination period, and
- considered the implications of the EPA's 2024 (and beyond) regulatory framework on Sydney Water's 2020 expenditure.

Based on the advice of our consultants, we consider that our decisions on efficient capital and operating expenditure should allow Sydney Water to continue to meet its environmental standards over the 2020 determination period. For example, under our draft decisions, we have:

- Included an allowance for wastewater capital expenditure that is 52% higher than Sydney Water's estimated spend in the current determination, which would allow Sydney Water to meet its environmental obligations. It is for Sydney Water to decide how it prioritises expenditure within its overall envelope to meet all of its obligations.
- Included a separate allowance of about $80 million for two discretionary projects – the Vaucluse Diamond-Bay and Waterways Health Improvement Programs – which would deliver environmental outcomes above mandated standards.
- Accepted Sydney Water's proposed expenditure on the Hawkesbury Nepean Offset Scheme (HNOS) to manage the level of nutrient discharge from treated wastewater into the Hawkesbury Nepean River, as population growth occurs in surrounding areas.

Appendices

A Requirements under the IPART Act

This appendix explains how we have considered certain matters we are required to consider under the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act).

A.1 Matters under Section 15 of the IPART Act

IPART is required under Section 15 of the IPART Act to have regard to the following matters:

a) The cost of providing the services concerned

b) The protection of consumers from abuses of monopoly power in terms of prices, pricing policies and standard of services

c) The appropriate rate of return on public sector assets, including appropriate payment of dividends to the Government for the benefit of the people of New South Wales

d) The effect on general price inflation over the medium term

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

f) The need to maintain ecologically sustainable development (within the meaning of Section 6 of the Protection of the Environment Administration Act 1991) by appropriate pricing policies that take account of all the feasible options available to protect the environment

g) The impact on pricing policies of borrowing, capital and dividend requirements of the government agency concerned and, in particular, the impact of any need to renew or increase relevant assets

h) The impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body

i) The need to promote competition in the supply of the services concerned

j) Considerations of demand management (including levels of demand) and least cost planning

k) The social impact of the determinations and recommendations

l) Standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).

Table A.1 outlines the Sections of the report that address each matter.

Table A.A.1 Consideration of Section 15(1) matters by IPART

Section 15(1)	Report reference
a) Cost of providing the services	Chapter 5 sets out Sydney Water's total efficient costs to deliver its regulated services over the determination period. Further detail is provided in Chapters 3 and 4, and Appendix F on efficient historical and forecast expenditure.
b) Protection of consumers from abuses of monopoly power	We consider our decisions would protect consumers from abuses of monopoly power, as they reflect the efficient costs Sydney Water requires to deliver its regulated services and meet mandated requirements. This is addressed throughout the report, particularly in Chapters 3 and 4 (where we establish the efficient historical and forecast expenditure) and Chapters 6, 7, 8, 9, 10 and 11 (where we set out our pricing decisions).
c) Appropriate rate of return and dividends	Chapter 5 outlines that we have allowed a market-based rate of return on debt and equity which would enable a benchmark business to return an efficient level of dividends to shareholders. Appendix H provides full details.
d) Effect on general price inflation	Chapter 14 outlines our estimate that the impact of our prices on general inflation is negligible.
e) Need for greater efficiency in the supply of services	Chapters 3 and 4 set out our draft decisions on Sydney Water's efficient historical and forecast expenditure. These draft decisions would promote greater efficiency in the supply of Sydney Water's regulated services.
f) Ecologically sustainable development	Chapters 3 and 4 efficient historical and forecast expenditure that allows it to meet all of its regulatory requirements, including its environmental obligations. Our draft decision to implement a drought water usage price (Chapter 6) would encourage water conservation in periods of drought.
g) Impact on borrowing, capital and dividend requirements	Chapters 5 and 14 explain how we have provided Sydney Water with an allowance for a return on and of capital and include our assessment of Sydney Water's financeability.
h) Impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body	Chapters 3 and 4 determine the prudent and efficient cost of construction and operational contracts that Sydney Water has entered into and costs associated with these over the next period.
i) Need to promote competition	In determining efficient costs, we have been mindful of relevant principles such as competitive neutrality (eg, we have included a tax allowance for Sydney Water as set out in Chapter 5).
j) Considerations of demand management and least cost planning	Chapters 3 and 4 outline how we have assessed Sydney Water's efficient historical and forecast expenditure required to deliver its regulated services at least cost. Chapter 6 outlines how we have set prices to reflect efficient costs, including the usage price to reflect the approximate estimate of marginal cost of supply – such cost-reflective prices promote the efficient use and distribution of resources (all else being equal).
k) Social impact	Chapter 14 considers the potential impact of our draft decisions on Sydney Water, its customers and the NSW Government (on behalf of the broader community).
l) Standards of quality, reliability and safety	Chapters 3 and 4 detail our consideration of Sydney Water's efficient historical and forecast expenditure so that it can meet the required standards of quality, reliability and safety in delivering its services.

A.2 Matters under Section 14A of the IPART Act

IPART is required under Section 14A of the IPART Act to have regard to the following matters:

a) The government agency's economic cost of production

b) Past, current or future expenditures in relation to the government monopoly service

c) Charges for other monopoly services provided by the government agency

d) Economic parameters, such as discount rates, or movements in a general price index (such as CPI), whether past or forecast

e) A rate of return on the assets of the government agency

f) A valuation of the assets of the government agency

g) 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

h) The need to promote competition in the supply of the service concerned

i) Considerations of demand management (including levels of demand) and least cost planning.

Table A.2 outlines the Sections of the report that address each matter.

Table A.A.2 Consideration of Section 14A(2) matters by IPART

Section 14A(2)	Report reference
a) Government agency's economic cost of production	Chapter 5 sets out Sydney Water's total efficient costs to deliver its regulated services over the determination period. Further detail is provided in Chapters 3 and 4 on efficient historical and forecast expenditure.
b) Expenditures in relation to the government monopoly service	Chapters 3 and 4 set out our draft decisions on Sydney Water's efficient historical and forecast expenditure.
c) Charges for other monopoly services	Chapter 11 sets out our draft decisions on Sydney Water's prices for other monopoly services.
d) Economic parameters, such as discount rates, or movements in CPI	Chapter 5 and Appendix H set out how we have indexed Sydney Water's regulatory asset base to account for inflation. Chapters 7 and 8 explain how we have set prices to raise revenue that recovers efficient costs over the determination period in net present value terms.
e) Rate of return on the assets of the government agency	Chapter 5 and Appendix H outline that we have allowed a market-based rate of return on debt and equity which would enable a benchmark business to return an efficient level of dividends.
f) Valuation of the assets	Chapter 5 and Appendix G set out the value of Sydney Water's assets on which we consider it should earn a return on capital and an allowance for regulatory depreciation.
g) Ecologically sustainable development	Chapters 3 and 4 set out Sydney Water's efficient historical and forecast expenditure that allows it to meet all of its regulatory requirements, including its environmental obligations. Our draft decision to implement a drought water usage price (Chapter 6) would encourage water conservation in periods of drought.

Section 14A(2)	Report reference
h) Need to promote competition	In determining efficient costs, we have been mindful of relevant principles such as competitive neutrality (eg, we have included a tax allowance for Sydney Water as set out in Chapter 5.
i) Considerations of demand management and least cost planning	Chapters 3 and 4 outline how we have assessed Sydney Water's efficient historical and forecast expenditure required to deliver its regulated services at least cost. Chapters 7, 8 and 10 outline how we have set prices to reflect efficient costs, including the usage price to reflect the approximate estimate of marginal cost of supply – such cost-reflective prices promote the efficient use and distribution of resources (all else being equal).

A.3 Matters under Section 16 of the IPART Act

The determination which accompanies this report increases a maximum price for a government monopoly service, or determines a methodology which would or might increase such a price.

Setting Sydney Water's prices below the maximum price that we set would likely result in a reduced dividend from Sydney Water, thus having a negative impact on Treasury's consolidated fund. Chapter 14 provides further information.

A.4 Section 16A directions

In the 2006 Metropolitan Water Plan, the NSW Government committed to increasing the amount of recycled water in Sydney to 70 billion litres a year by 2015. In support of this commitment, the NSW Government directed Sydney Water, under Section 20P of the State Owned Corporations Act 1989 (NSW), to complete two recycled water projects:

- the Rosehill-Camellia Recycled Water Scheme (formerly known as the Camellia Recycled Water Scheme)
- the St Marys Recycled Water Project (formerly known as the Replacement Flows Project).

At the same time, a Ministerial direction under Section 16A of the IPART Act required IPART to include the efficient costs of complying with the Section 20P directions in Sydney Water's prices.

Pursuant to Section 16A(1) of the IPART Act, the portfolio Minister for a government agency may direct IPART, when it makes a determination of the maximum price for a government monopoly service provided by the agency, to include in the maximum price an amount representing the efficient cost of complying with a specified requirement imposed on the agency.

For Sydney Water price review, we have assessed the efficiency of the above (2) recycled water projects. Our findings are in Chapter 10.

The below section shows our Section 16A directions.

A.4.1 NSW Government directions to IPART

New South Wales

The Hon Nathan Rees MP
Minister for Emergency Services
Minister for Water Utilities

RECEIVED
2 0 MAR 2008
INDEPENDENT PRICING & REGULATORY TRIBUNAL

SW Ref: 003187

Dr Michael Keating AC
Chairman
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB POST OFFICE NSW 1230

12 MAR 2008

Dear Dr Keating

My letter to the Tribunal directing it to include the efficient costs of the desalination plant in Sydney Water's prices foreshadowed a similar direction in relation to the Rosehill (Camellia) Recycled Water Project.

The Government's intention is that potable water prices should include some of the costs incurred by Sydney Water in undertaking the Rosehill (Camellia) Recycled Water Project. The costs to be included in potable water charges represent the difference between the charges paid by Sydney Water to the owner of the Rosehill (Camellia) Recycled Water infrastructure and distribution pipelines, and the revenue received by Sydney Water from the sale of recycled water to customers.

I have directed Sydney Water, under section 20P of the *State Owned Corporations Act 1989*, to undertake the Rosehill (Camellia) Recycled Water Project. Pursuant to section 16A of the *Independent Pricing and Regulatory Tribunal Act 1992*, I direct the Tribunal, when it determines the maximum price for government monopoly services provided by Sydney Water, to include in that price an amount representing the efficient cost of complying with the requirements imposed on Sydney Water to undertake the Rosehill (Camellia) Recycled Water Project, which includes:

- entering into agreements for the supply of recycled water to foundation customers;
- purchasing recycled water from a private recycled water supplier for supply to customers; and
- arranging for the private recycled water supplier to finance, construct, operate and maintain recycled water infrastructure, initially capable of supplying around 4.3 billion litres of recycled water per year, and the necessary distribution pipelines

Yours sincerely

Nathan Rees MP
Minister for Water Utilities
Minister for Emergency Services

Level 25, 9 Castlereagh Street, Sydney NSW 2000
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New South Wales

The Hon Nathan Rees MP
Minister for Emergency Services
Minister for Water Utilities

RECEIVED
23 AUG 2007

SW Ref: SD 002243

Dr Michael Keating AC
Chairman
Independent Pricing and Regulatory Tribunal
PO BOX Q290
QVB POST OFFICE NSW 1230

17 AUG 2007

Dear Dr Keating

I refer to the Premier's request under section 12 of the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act) that the Tribunal make a new pricing determination for Sydney Water Corporation.

As you are aware, the Government's intention is that the new determination will consider a range of projects that Sydney Water is undertaking to address the ongoing drought conditions and to secure Sydney's long term water supply.

I have directed Sydney Water, under section 20P of the *State Owned Corporations Act 1989*, to construct, operate and undertake the Western Sydney Recycled Water Initiative Replacement Flows Project. The project consists of;

- an Advanced Water Treatment Plant with interconnecting systems from Penrith, St Marys and Quakers Hill Sewage Treatment Plants;
- associated infrastructure and a pipeline from the treatment plant; and
- a pilot plant at St Mary's Sewage Treatment Plant and associated infrastructure.

Pursuant to section 16A of the IPART Act, I direct the Tribunal, when it determines the maximum price for Government monopoly services provided by Sydney Water, to include in that price an amount representing the efficient cost of complying with the Direction, including the ongoing operating costs of the project.

As you are aware, it is also the Government's intention for costs relating to the Camellia Recycled Water scheme be included in the Tribunal's determination. Sydney Water is finalising the tenders for this project and once this process has concluded I intend to issue a direction to Sydney Water under section 20P of the SOC Act and to the Tribunal under section 16A of the IPART Act.

Yours sincerely

Nathan Rees MP
Minister for Water Utilities
Minister for Emergency Services

Level 25, 9 Castlereagh Street, Sydney NSW 2000
Telephone (02) 9228 5050 Facsimile (02) 9228 5099
reception@rees.minister.nsw.gov.au

B How we set prices

We set the maximum prices Sydney Water can charge its customers for its monopoly services, to recover the efficient costs needed to deliver its water, wastewater and stormwater services. We also consider the structure of the prices we set and how to encourage efficient consumption and investment decisions.

The sections below briefly explain how we approach the two major elements of the review. That is:

1. Estimating Sydney Water's efficient costs and 'notional revenue requirement' (NRR) (Section B.1), and
2. How the NRR is shared between customers through price structures (Section B.2).

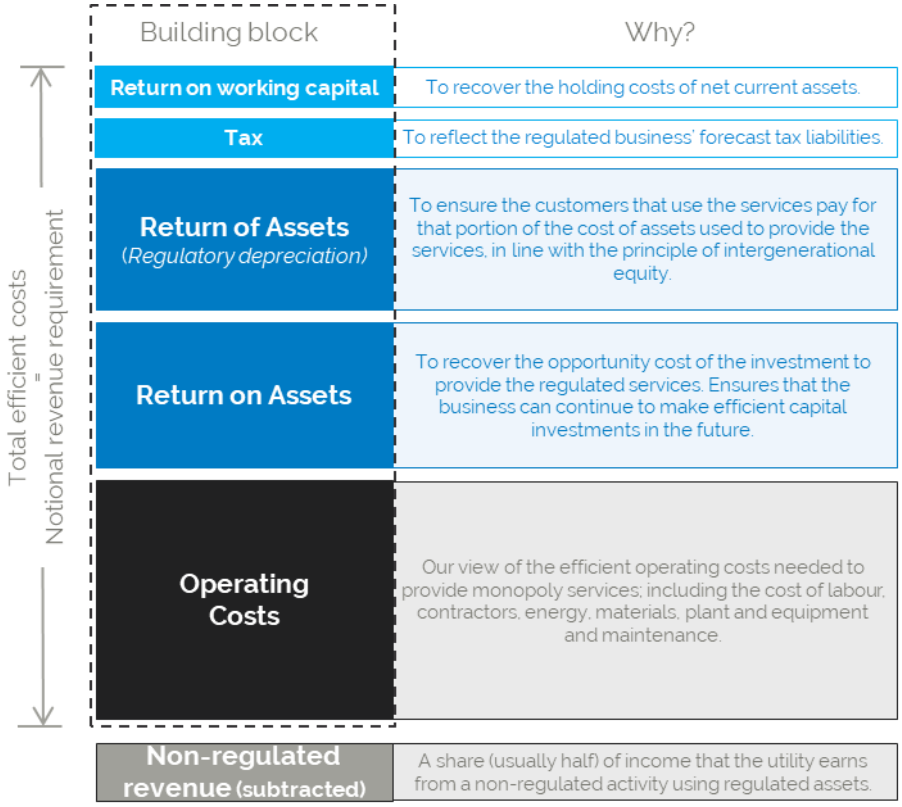
B.1 Estimating the efficient costs

Our first step in determining prices is to calculate the notional revenue requirement (NRR), which represents our view of the total efficient costs for Sydney Water to provide regulated services in each year of the determination period.

As in previous reviews, we have used a 'building block' method to calculate the NRR, which represents our view of the efficient costs for Sydney Water to deliver its regulated services. Figure B.1 provides a brief explanation of each building block allowance within the NRR. We generally set prices to recover the utility's NRR.

The sections below provide more detail on how we calculated each component of the building block, and where in the report you can find more detail.

Figure B.1 Building block approach to calculating notional revenue requirement (NRR)



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

B.1.1 Operating expenditure

The allowance for operating expenditure in the building block reflects our view of the efficient level of operating costs required to deliver Sydney Water's services to its customers over the determination period. These costs include the costs of labour, service contractors, energy, materials, and plant and equipment.

We engage expert consultants to assess the efficiency of Sydney Water's proposed operating expenditure and to examine whether the expenditure represents the most cost effective way of delivering regulated services. Our efficiency test is presented in Chapter 4.

Box B.1 Efficiency test

The efficiency test examines whether a utility's operating and capital expenditure represents the best and most cost-effective way of delivering monopoly services to customers.

Broadly, the efficiency test considers both how the investment decision is made, and how the investment is executed, having regard to, amongst other matters, the following:

- Customer needs, subject to the utility's regulatory requirements.
- Customer preferences for service levels, including customers' willingness to pay.
- Trade-offs between operating and capital expenditure, where relevant.
- The utility's capacity to deliver planned expenditure.
- The utility's expenditure planning and decision-making processes.

The efficiency test is applied to:

- historical capital expenditure, and
- forecast capital and operating expenditure

that is included in the utility's revenue requirement, for the purposes of setting regulated prices.

The efficiency test is based on the information available to the utility at the relevant point in time. That is:

- For forecast operating and capital expenditure, we assess whether the proposed expenditure is efficient given currently available information.

For historical capital expenditure, we assess whether the actual expenditure was efficient based on the information available to the utility at the time it incurred the expenditure (ie, whether the utility acted prudently in the circumstances prevailing at the time it incurred the expenditure).

B.1.2 Capital allowance - Return on Assets and Regulatory Depreciation

After operating expenditure, the two largest allowances in the NRR are for a **return on assets** and **regulatory depreciation**, both of which are related to Sydney Water's existing assets and capital expenditure.

The capital expenditure is also subject to the same efficiency test as operating expenditure. As explained in Box B.1 above, we apply our efficiency test to **actual** capital expenditure incurred over the current period (2016 determination period), and the proposed expenditure for the upcoming determinations period (ie, 2020 determination period), and we only add efficient capital expenditure to the RAB.

Box B.2 below explains how capital expenditure affects prices, and the return on assets and regulatory depreciation are both explained further below.

Box B.2 How capital expenditure affects prices

Under our building block model, we do not include up-front capital costs in prices. Instead, we add capital costs to the Regulatory Asset Base (RAB) to calculate capital-related allowances to be included in the Notional Revenue Requirement (NRR) and recovered via prices. Capital expenditure is thus recovered via two allowances:

3. **Allowance for a return on assets.** This is the RAB value multiplied by the weighted average cost of capital (WACC). We have a standard methodology to calculate the return on assets (WACC methodology) and we do not propose any changes.

   We note that we are currently in a low WACC environment, which dampens the impact that capital expenditure has on prices. However, assets paid for through capital expenditure remain in the RAB for the duration of their lives, and a future WACC increase could significantly impact prices.

4. **Allowance for regulatory depreciation**, whereby the total cost of an asset is recovered over its life.

Return on assets

The return on assets allowance represents our assessment of the opportunity cost of the capital invested to provide the regulated services. Our approach ensures that the business can continue to make efficient capital investments in the future.

To calculate this allowance, we multiply the value of the RAB in each year of the determination period by an appropriate rate of return, which we calculate as the WACC. In 2018, we revised our standard methodology to calculate the WACC, and Appendix H provides details on how we have applied it.

Regulatory depreciation

The building block model includes an allowance for a return **of** assets (regulatory depreciation). We typically use straight line depreciation to calculate this allowance, which means that the value of the asset is returned to the utility evenly over the asset's economic life. That is, the value of an asset is divided by its assumed life in years to determine the annual allowance for depreciation for that asset.

It is important that the asset lives we use in calculating Sydney Water's depreciation allowance are accurate – ie, they reasonably reflect the consumption of its assets. If they are too short, today's customers will over-pay (ie, pay for future customers' consumption of the assets). If they are too long, today's customers will pay less but future customers may pay for assets that they don't use, and the utility may also face financeability concerns for a period of time.

In practice, we do not divide every asset's value by its specific life. Some form of aggregation is required – eg, dividing the RAB by the weighted average life of assets in the RAB, or dividing parts of the RAB by the weighted average life of assets in each part.

B.1.3 Tax

We include an explicit allowance for tax, because we use a post-tax WACC to estimate the return on assets in the NRR.[99] This allowance reflects what Sydney Water's tax liabilities would be under our regulatory settings.

Our tax allowance is not intended to recover Sydney Water's actual tax liability over the determination period. Rather, it reflects the liability that a comparable commercial business would be subject to. Including this allowance is consistent with our aim to set prices that reflect the full efficient costs a utility would incur if it were operating in a competitive market (including if it were privately owned). It is also consistent with the principle of competitive neutrality, that is, that a government business should compete with private business on an equal footing and not have a competitive advantage due to its public ownership.

We calculate the tax allowance for each year by applying the relevant tax rate, adjusted for the value of imputation credits (the 'gamma'), to the business's taxable income. For this purpose:

- Taxable income is the notional revenue requirement (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses.
- We require the business to provide forecast tax depreciation, which we may adjust to reflect the Tribunal's decisions on capital expenditure and assets free of charge (AFOC).
- Other items such as interest expenses are based on the parameters used for the WACC, and the value of the RAB and working capital.

B.1.4 Return on working capital

The working capital allowance component of the NRR represents the return the business could earn on the net amount of working capital it requires each year to meet its service obligations. It ensures the business recovers the costs it incurs due to the time delay between providing a service and receiving the money for it (ie, when bills are paid).

In 2018, we developed a standard approach to calculate the working capital allowance, which can be found on our website.[100] In summary, we:

1. Calculate the net amount of working capital the utility requires, using the formula:

   $$net\ working\ capital = receivables - payables + inventory + prepayments$$

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

B.2 Setting prices to recover the NRR

Once we determine the utility's NRR using the building block methodology, we then generally set prices to recover the NRR.

99 Sydney Water pays tax equivalents to NSW Treasury under the National Tax Equivalents Regime (NTER). The regulatory tax allowance we set is not intended to match Sydney Water's actual tax equivalent payments. It is derived using our assessment of efficient expenditure, the regulatory gearing ratio (ie, debt to equity ratio) and our decision on the WACC and cost of debt.

100 IPART, Working Capital Allowance Policy Paper, November 2018.

In structuring prices, we aim to find a balance between the principle that customers should pay for the costs they create, thus sending appropriate price signals; and having a relatively simple and easy to understand framework. We generally work within a postage stamp pricing framework, consistent with Government policy.[101] A key consideration for setting prices is how to balance the share of revenue that should be recovered from fixed charges against variable (or usage) charges for water and wastewater services. We often set the usage charge with reference to the marginal cost of supply, with fixed (or service) charges set to recover the remaining revenue requirement. Chapter 6 includes more information on price structures and our draft prices.

Box B.3 outlines our principles in setting prices.

Box B.3 Our pricing principles

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

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

Through the signals they send, cost-reflective prices promote the efficient use and allocation of resources, which ultimately benefits the whole community. The sum of the fixed and usage prices customers pay reflects the total cost of the services provided. By reflecting the revenue needed to efficiently provide the services, cost-reflective prices also ensure efficient investment in water infrastructure and service provision.

Other factors we generally consider when deciding on price structures include whether prices are transparent, easy for customers to understand and Sydney Water to administer, and customer preferences.

B.2.1 Non-residential large water users have the option to opt-out of our prices

In our 2016 reviews, we decided to allow Hunter Water and Sydney Water to enter into unregulated pricing agreements (UPAs) with large non-residential customers. Neither utility entered a UPA during the 2016 determination period. We have maintained the option in the 2020 determination period for Sydney Water.

How do unregulated pricing agreements work?

We continue to set maximum prices for monopoly services. However, if Sydney Water and a large non-residential customer enter into a pricing agreement, they would opt-out of the

101 Postage stamp pricing means that customers pay the same for a service regardless of where in the utility's area of operations they are located. That is, we generally cannot set location-based prices.

prices we set, and be subject to the agreement instead (for water supply and sewerage services only). Key feature of this pricing option are that:

- UPAs are optional and are only entered into voluntarily if the agreement is mutually beneficial to the utility and the large non-residential customer. If the foreseen benefits do not outweigh the costs, then parties should not enter the agreement. The additional, administrative burden to negotiate, manage and ring-fence the agreement should be factored in when considering an agreement.
- The costs and revenues associated with the customer would have to be ring-fenced from the broader cost and revenue base, to ensure that the broader customer base does not subsidise the costs of servicing a large customer.
- The customer would not be able to opt back in to regulated prices within the determination period, and should factor this in to its consideration.

B.3 How long to set prices for?

For each water pricing review, we decide on the length of the determination period. In general, this can be between one and five years.

We decide this on the appropriate determination length a case-by-case basis, and in doing so, we consider the range of factors outlined in Box B.4.

Box B.4 Factors we consider in deciding the length of a determination

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

- Confidence we have in the utility's forecasts.
- Risk of structural changes in the industry.
- Need for price flexibility and incentives to increase efficiency.
- Need for regulatory certainty and financial stability.
- Timing of other relevant reviews.
- Views of stakeholders.

Longer determination periods have several advantages over shorter periods. For example, a longer period:

- provides greater stability and predictability (which may lower a utility's business risk and assist investment decision making), and
- creates strong incentives for a utility to increase efficiency; and reduces regulatory costs.

However, longer determination periods also have disadvantages. These include:

- increased risk associated with using inaccurate data to set prices
- possible delays in customers benefitting from any efficiency gains, and
- the risk that changes in the industry will impact the effectiveness of the determination.

C Context for this review

IPART is the principal economic regulator in New South Wales. Our main functions are set out in the IPART Act. Among other responsibilities, we determine the maximum prices for declared government monopoly services provided by water utilities under the *Sydney Water Act 1991*, and in accordance with the matters under Section 15 of the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act, see Appendix A).[102, 103]

Sydney Water is Australia's largest water utility, serving around 5.1 million residential and non-residential customers with water, wastewater and stormwater drainage services in the Sydney, Illawarra and Blue Mountains areas.

- Sydney Water primarily purchases bulk water from WaterNSW Greater Sydney. It also purchases water from the Sydney Desalination Plant (SDP) when WaterNSW's dam levels fall below 60% of total dam storage.[104] Sydney Water then treats this water before delivering it to its customers. In addition, Sydney Water provides some customers with raw water, recycled water and bulk water. In total, Sydney Water delivers around 1,500 million litres of water per day to its customers.
- Sydney Water operates 30 separate wastewater systems including 16 wastewater treatment plants. It collects around 1,500 million litres of wastewater each day from its customers, treats it through its treatment plants and then either reuses or discharges treated sewage (or wastewater) into waterways such as rivers or the ocean. The biosolids produced by this treatment are then sold by Sydney Water to industry for use in agriculture, composting and land rehabilitation.
- Sydney Water owns and maintains over 454 kilometres of stormwater channels, which service about 633,000 properties.

Sydney Water's service charges are different for the different services that it provides.

- Users of drinking water are charged a fixed service charge and a usage charge.
- Residential users of wastewater services are charged a fixed service charge, which includes a deemed usage component that reflects the average customer wastewater discharge (or discharge allowance) into the wastewater network. Non-residential customers are charged both a fixed service charge and a usage charge if they discharge more wastewater than the discharge allowance.
- Stormwater charges are applied to about 20% of properties that are within Sydney Water's declared stormwater catchment areas.

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

103 We are also concurrently reviewing prices for WaterNSW's provision of bulk water, and Hunter Water's water, sewerage and stormwater drainage services from 1 July 2020. Information on these reviews is available on our website: https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing

104 SDP's operating rules are set out in the New South Wales Government's *2017 Metropolitan Water Plan*.

C.1 Our review process

This review sets the maximum prices that Sydney Water can charge its customers for water, wastewater, stormwater and other miscellaneous and ancillary services.[105] We also monitor prices that Sydney Water charges customers for recycled water.

IPART generally sets these prices every four years. We use a propose-respond regulatory model for this review. The model operates via a two-step process:

- In the first step, Sydney Water submits its pricing proposal, which includes its proposed prices, operating and capital costs and preferred approach to setting prices for the four years from 1 July 2020. Sydney Water submitted both a pricing proposal to IPART for review on 1 July 2019, and an update to that proposal on 12 November 2019.
- In the second step, IPART responds to Sydney Water's proposal, determining Sydney Water's efficient costs, our pricing framework, and how we can set the best incentives for Sydney Water to become more efficient over time. IPART responded to Sydney Water's proposal in September 2019 with an Issues Paper.[106]

Figure C.1 sets out the two-step process.

Figure C.1 Our process for setting prices under a propose-respond regulatory model

We have completed our draft assessment of:

- Sydney Water's efficient costs of supplying its services, and
- The appropriate prices and price structures to recover these.

In doing so, we have taken into account a broad range of issues, consistent with the matters we must consider under the IPART Act. Our response to these matters is provided in Appendix A.

C.2 What drives Sydney Water's costs?

We set prices to recover the efficient cost of Sydney Water to deliver its monopoly services. Sydney Water's costs can be allocated into five broad categories, which are the costs:

- to meet its existing service standards and **regulatory obligations**, including any new or amended standards or obligations

105 These are the monopoly services that we review under Section 11 of the *Independent Pricing and Regulatory Tribunal Act 1992 (NSW)* (the *IPART Act*).

106 These documents can be found on IPART's website.

- to deliver its monopoly services to new development areas ('**growth costs**')
- of **discretionary** projects, where Sydney Water shows its customers are willing-to-pay to receive services above its regulated standards
- of implementing any long-term plans under the **Metropolitan Water Plan**, and
- to comply to **Government Directions** issued to Sydney Water to complete projects in the public interest.

C.2.1 Regulatory obligations

Sydney Water is a statutory corporation established under the *Sydney Water Act 1994*. Under the Act it has three principal objectives:

- To be a successful business and, to this end:
  - To operate at least as efficiently as any comparable businesses, and
  - to maximise the net worth of the State's investment in the Corporation, and
  - to exhibit a sense of social responsibility by having regard to the interests of the community in which it operates.
- To protect public health by supplying safe drinking water
- To protect the environment by conducting operations in compliance with the principles of ecologically sustainable development.

To meet these objectives, Sydney Water must comply with standards set by a number of regulators. The cost to Sydney Water to deliver its monopoly services consistent with its regulatory obligations, such as its environmental licences and operating licence (which determines its service standards), have accounted for 58% of Sydney Water's total proposed operating and capital costs.[107] Sydney Water is regulated by:

- **IPART**, which monitors and reports on Sydney Water's compliance with its **operating licence**, which includes Sydney Water's obligations in relation to customer service, water quality, and system performance. We also periodically review the licence.
  - Tied to the Operating Licence is Sydney Water's Customer Contract. Under its Customer Contract, Sydney Water may charge its customers a late payment fee for overdue bills and a dishonoured or declined payment to Sydney Water. IPART regulates these charges under Section 12A of the IPART Act.
- **The NSW Environment Protection Authority** (EPA), which issues Environment Protection Licences[108] for Sydney Water's wastewater network, pumping stations and treatment systems, and monitors and regulates Sydney Water's environmental performance.
- **NSW Health,** which regulates the quality and safety of Sydney Water's drinking water.

107 This is the percentage amount proposed by Sydney Water in its pricing proposal for the 4-year period from 2020-21 to 2023-24.

108 Under the Protection of the Environment Operations Act 1997 (NSW).

- **The Department of Planning Industry and Environment (DPIE),** which regulates Sydney Water's extractions from the Hawkesbury-Nepean River. These extractions are used by the North Richmond water filtration plant to provide drinking water supply for the Hawkesbury area.

Sydney Water's regulatory obligations are subject to periodic review by each respective regulator, which results in changes over time. Changes in its regulatory obligations can increase (or decrease) the costs Sydney Water must incur to comply with these obligations. Sydney Water's existing operating licence was reviewed and amended in 2018-2019, with the new version applying from November 2019. Included in the amended licence (which is not a requirement in the existing licence) is the requirement for Sydney Water to implement an economic level of water conservation. The costs to comply with this new requirement are included in Sydney Water's proposed operating expenditure and discussed in more detail in Chapter 5 of this Draft Report.

C.2.2 Discretionary spending

Discretionary expenditure is expenditure to deliver service levels or outcomes above those mandated by regulatory requirements. Sydney Water proposed including about $105 million of capital costs over the four year period (2020-21 to 2023-24) for discretionary expenditure. Chapter 9 discusses our decisions on this expenditure.

C.2.3 Investments to service growth

As the population grows, Sydney Water's area of operations continues to expand as development spreads into greenfield areas, and it will incur additional costs as it augments its existing network to cope with increased density in established areas. This requires Sydney Water to build and operate new water, wastewater and stormwater infrastructure.

C.2.4 The Metropolitan Water Plan

The NSW Government's Metropolitan Water Plan (MWP) is the Government's long-term water plan for Sydney. It outlines the mix of supply augmentation and demand management measures that ensure Sydney, the Illawarra and the Blue Mountains meet water needs now and into the future.

The elements in the MWP that can impact on Sydney Water's costs and prices are:

- Water demand and supply projections and the identification of options for future supply augmentation, which can impact on estimates of the Long Run Marginal Cost (LRMC) of water supply (ie, our benchmark for setting water usage prices in past water price reviews).
- The Drought Response Strategy, which includes:
  - transfers of bulk water from Shoalhaven to Sydney when total dam storages fall below 75%
  - the imposition of water restrictions at specified dam storage levels, which impacts water sales volumes

- the operation of the Sydney Desalination Plant (SDP) to deliver bulk water to Sydney Water when total dam storages fall below 60%, and
- the expansion of SDP when total dam storages fall below 35%.

- Any costs for WaterNSW in terms of general supply augmentation and drought response, which would flow through to Sydney Water's bulk water costs.

The MWP is reviewed periodically. It was first developed in 2004 in response to severe drought, and revised in 2006 and 2010. The most recent MWP, released in 2017, is currently being reviewed by the NSW Government to take into account changes in water demand and supply and new data and research. It is due to be released in 2020.[109]

C.2.5 Government Directions under S16A of the IPART Act

The Government can issue directions for Sydney Water to complete projects in the public interest, which may not be in the shareholders' interest.[110] At the same time, it can direct IPART (with the Minister's approval) under Section 16A of the IPART Act to include the efficient costs of complying with specified requirements in Sydney Water's prices.[111] This can take the form of either:

- a 'standing direction' (which applies whenever IPART makes a determination in relation to a particular government monopoly service), or
- a 'one-off direction' (which applies when IPART makes a particular pricing determination).

For this review, three Ministerial directions pursuant to Section 16A of the IPART Act (Section 16A directions) apply. These relate to:

- **Stormwater works at Green Square.** This was issued to IPART in January 2014. It directs IPART to pass through in prices Sydney Water's efficient costs of complying with requirements to undertake stormwater amplification works and construct interconnected stormwater infrastructure in connection with the Green Square development.
- **The Rosehill (Camellia) Recycled Water Project.** This was issued to IPART in March 2008. It directs IPART to pass through in prices the difference between the charges paid by Sydney Water to the owner of the Rosehill (Camellia) Recycled Water infrastructure and distribution pipelines, and the revenue received by Sydney Water for the sale of recycled water to customers.
- **The Replacement Flows Project.** This was issued to IPART in August 2007. It directs IPART to pass through in prices Sydney Water's efficient costs of construction and ongoing operation of the St Mary's Advanced Water Recycling Plant.

109 NSW Government, Planning for Sydney, https://www.planning.nsw.gov.au/About-Us/Sydney-Metropolitan-Water/Planning-for-Sydney, access on 20 August 2019.

110 Typically through a direction given under Section 20P of the SOC Act.

111 Under Section 16A(3) of the IPART Act a specified requirement may only be a requirement imposed by or under a licence or authorisation, a requirement imposed by a ministerial direction under an Act, or some other requirement imposed by or under an Act or statutory instrument.

D Impacts of draft prices

D.1.1 Indicative bill impacts for residential customers

Most residential customers' bills are for water services. Almost all customer bills also include wastewater services and about 25% also include stormwater services.

We have undertaken analysis of the customer base, using data to assess affordability and bill impacts for various customers at different usage levels under our drought, and non-drought water prices (Tables D.1 through D.4). These show the estimated bill impacts for the above services, including discretionary expenditure, for several customer categories, including:

- House - small household – water usage 100 kL/year.
- House – typical household – water usage 200 kL/year.
- House – large household – water usage 300 kL/year.
- Apartment – typical apartment – water usage 160 kL/year.
- Pensioner – typical household – water usage 100 kL/year.
- Industrial users – low usage (150 kL/year), medium usage (5,800 kL/year), high usage (26,000 kL/year).
- Commercial users – low usage (310 kL/year), medium usage (6,700 kL/year), high usage (21,000 kL/year).
- Public hospitals – medium usage (20,000 kL/year) and high usage (33,000 kL/year).
- Private schools – low usage (7,700 kL/year), medium usage (24,000 kL/year), high usage (35,000 kL/year).
- Commercial strata units – low usage (130 kL/year), medium usage (180 kL/year), high usage (2,100 kL/year).
- Industrial strata units – low usage (75 kL/year), medium usage (90 kL/year), high usage (32,000 kL/year).

Residential

For residential customers[112]:

- Under non-drought conditions, bills would be lower for essentially all households (for households that consume less than 900kL per year), with small users of water realising the greatest percentage cost improvements (Table D.1), and
- Under drought conditions, bills would be lower for lower users of water (those using less than 170kL per year), and would be higher for medium and large users of water (for example, about 10% higher for households using 300kL per year) (Table D.2).

[112] These bills include the costs with and without discretionary expenditure and stormwater charges, as appropriate.

Table D.1 Bill impacts of draft prices for residential customers – by household size/type (nominal $) – non-drought conditions

Residential property type	2019-20	2020-21	2021-22	2022-23	2023-24	% change 2019-20 to 2023-24
House - including stormwater - (small household)	1,001	860	881	903	926	-8%
House - excluding stormwater - (small household)	923	784	804	824	845	-8%
House - including stormwater - (typical household)	1,212	1,095	1,122	1,150	1,179	-3%
House - excluding stormwater - (typical household)	1,134	1,019	1,045	1,071	1,098	-3%
House - including stormwater - (large household)	1,423	1,329	1,363	1,397	1,432	1%
House - excluding stormwater - (large household)	1,345	1,254	1,285	1,318	1,350	0%
Pensioner household – including stormwater (typical)	346	353	362	371	380	10%
Pensioner household – excluding stormwater (typical)	334	341	350	358	367	10%
Apartment – including stormwater (typical)	1,074	949	973	997	1,022	-5%
Apartment – excluding stormwater (typical)	1,049	925	948	972	996	-5%

Notes: Water consumption assumed to be 200 kL per year for "typical" households, 100 kL per year for "small" households, 300 kL per year for "large" households, 100 kL per year for pensioners, 160 kL per year for apartments. Bill impacts include discretionary expenditure.

Source: IPART analysis using our proposed draft prices and 2015 IPART Household Survey data

Table D.2 Bill impacts of draft prices for residential customers – by household size/type (nominal $) – drought conditions

Residential property type	2019-20	2020-21	2021-22	2022-23	2023-24	% change 2019-20 to 2023-24
House - including stormwater - (small household)	1,001	944	967	991	1,016	1%
House - excluding stormwater - (small household)	923	868	890	912	935	1%
House - including stormwater - (typical household)	1,212	1,262	1,294	1,326	1,359	12%
House - excluding stormwater - (typical household)	1,134	1,187	1,216	1,247	1,278	13%
House - including stormwater - (large household)	1,423	1,581	1,620	1,661	1,702	20%
House - excluding stormwater - (large household)	1,345	1,505	1,543	1,581	1,621	21%
Pensioner household – including stormwater (typical)	346	437	448	459	470	36%
Pensioner household – excluding stormwater (typical)	334	425	436	446	458	37%
Apartment – including stormwater (typical)	1,074	1,083	1,110	1,138	1,166	9%
Apartment – excluding stormwater (typical)	1,049	1,059	1,086	1,113	1,141	9%

Notes: Water consumption assumed to be 200 kL per year for "typical" households, 100 kL per year for "small" households, 300 kL per year for "large" households, 100 kL per year for pensioners, 160 kL per year for apartments. Bill impacts include discretionary expenditure.
Source: IPART analysis using our proposed draft prices and 2015 IPART Household Survey data

Non-residential

For non-residential customers:

- Under non-drought conditions, bills would be lower for low and medium users of water, but would be slightly higher for large consumers (Table D.3), and
- Under drought conditions, bills would be higher for almost all types of users, with the heaviest users of water experiencing the most significant increases in their bills (Table D.4).

Table D.3 Bill impacts of draft prices for a sample of non-residential customers (nominal $) – non-drought conditions

Non-residential property type and water usage	kL pa	2019-20	2020-21	2021-22	2022-23	2023-24	% change 2019-20 to 2023-24
Industrial – low	150	1,069	902	924	947	971	-9%
Industrial – medium	5,800	19,654	20,473	20,985	21,509	22,047	12%
Industrial – high	26,000	83,864	87,962	90,161	92,415	94,726	13%
Commercial – low	310	1,538	1,443	1,479	1,516	1,554	1%
Commercial – medium	6,700	24,172	24,813	25,433	26,069	26,721	11%
Commercial – high	21,000	73,690	76,327	78,235	80,191	82,196	12%
Public hospital – medium	20,000	72,915	75,192	77,072	78,998	80,973	11%
Public hospital – high	33,000	119,444	123,457	126,544	129,707	132,950	11%
Private school - low	7,700	27,494	28,383	29,093	29,820	30,565	11%
Private school – medium	24,000	84,022	87,394	89,578	91,818	94,113	12%
Private school – high	35,000	122,411	127,075	130,252	133,508	136,846	12%
Commercial strata unit – low	130	1,015	823	843	865	886	-13%
Commercial strata unit – medium	180	1,448	1,219	1,249	1,280	1,312	-9%
Commercial strata unit – high	2,100	9,042	8,861	9,083	9,310	9,542	6%
Industrial strata unit – low	75	899	641	657	674	690	-23%
Industrial strata unit – medium	90	1,249	912	935	958	982	-21%
Industrial strata unit – high	32,000	96,484	103,661	106,252	108,909	111,631	16%

Note: Non-residential property type corresponds to those described in Technical Paper 8 of Hunter Water's 1 July 2019 Proposal (from pp 53-71). Bill impacts exclude trade waste charges.

Source: IPART analysis using our recommended draft NRR and draft prices

Table D.4 Bill impacts of draft prices for a sample of non-residential customers (nominal $) – drought conditions

Non-residential property type and water usage	kL pa	2019-20	2020-21	2021-22	2022-23	2023-24	% change 2019-20 to 2023-24
Industrial – low	150	1,069	1,027	1,053	1,079	1,106	3%
Industrial – medium	5,800	19,654	25,330	25,963	26,612	27,278	39%
Industrial – high	26,000	83,864	109,736	112,480	115,292	118,174	41%
Commercial – low	310	1,538	1,702	1,745	1,788	1,833	19%
Commercial – medium	6,700	24,172	30,424	31,185	31,964	32,763	36%
Commercial – high	21,000	73,690	93,914	96,261	98,668	101,135	37%
Public hospital – medium	20,000	72,915	91,941	94,240	96,596	99,010	36%
Public hospital – high	33,000	119,444	151,094	154,871	158,743	162,711	36%
Private school - low	7,700	27,494	34,831	35,702	36,595	37,510	36%
Private school – medium	24,000	84,022	107,493	110,180	112,934	115,758	38%
Private school – high	35,000	122,411	156,386	160,296	164,303	168,410	38%
Commercial strata unit – low	130	1,015	932	955	979	1,003	-1%
Commercial strata unit – medium	180	1,448	1,369	1,404	1,439	1,475	2%
Commercial strata unit – high	2,100	9,042	10,620	10,885	11,157	11,436	26%
Industrial strata unit – low	75	899	704	722	740	758	-16%
Industrial strata unit – medium	90	1,249	987	1,012	1,037	1,063	-15%
Industrial strata unit – high	32,000	96,484	130,459	133,721	137,064	140,490	46%

Note: Non-residential property type corresponds to those described in Technical Paper 8 of Hunter Water's 1 July 2019 Proposal (from pp 53-71). Bill impacts exclude trade waste charges.

Source: IPART analysis using our recommended draft NRR and draft prices

E Continuing and catch up efficiencies

In reviewing the expenditure of water utilities, we may decide to apply catch-up efficiency targets to the proposed expenditure of those that are not yet at the frontier. The catch-up efficiency adjustment reflects the scope to make efficiency improvements in systems and processes to achieve the performance of an efficient frontier company over time.

In addition, we generally apply a continuing efficiency adjustment. This adjustment reflects that ongoing productivity improvements should reduce costs gradually over time. It represents the scope for a top performing or 'frontier' company to continue to improve efficiency over time as innovation and new technologies enable firms to do more with less input.

The continuing efficiency adjustment is important to ensure that water utilities continue to innovate and deliver efficiency benefits to customers. By putting a quantitative target in place, we establish an expectation of continuous improvement.

This appendix presents our assessment of the ongoing efficiency adjustments that we have applied to Sydney Water.

E.1 An ongoing efficiency adjustment should apply to both operating and capital expenditure

For any capital intensive business, some of the most important opportunities for productivity gain are in its capital program. Some of the activities carried out in delivering its services such as project cost estimation, capital program planning, procurement and delivery of capital works are areas where innovation and process improvements provide scope for efficiency gains.

We consider that if an ongoing adjustment for productivity improvements is justified, then it should be applied to both capital expenditure and operating expenditure.

An exception to this, however, is the cost of bulk water. This is because efficiency adjustments have already been applied to bulk water costs in other reviews (eg, WaterNSW Greater Sydney and Sydney Desalination Plant). To include these costs for Sydney Water would result in applying efficiency adjustments twice.

E.2 What productivity target is best supported by evidence?

Our review of Productivity Commission multi-factor productivity (MFP) data suggests that a sustained average annual MFP improvement[113] of between 0.6% and 0.8% is achievable in

113 We consider that MFP is a more useful productivity indicator than labour productivity for a public water utility, which must make substantial capital investments efficiently.

Australia.[114] These results include performance from 1975-76 to 2017-18. They reflect economy-wide performance,[115] ie, all industry sectors and all firms in each sector—not just frontier firms. In that sense, this range is conservative. Recognising this conservatism, our draft decision is to accept the top end of that range: 0.8% per annum.

Evidence from the Productivity Commission

The Productivity Commission's 2019 Productivity Bulletin presents MFP estimates for the Australian economy from 1975-76 to 2017-18. Figure E.1 shows the arithmetic averages over various time periods ending in 2017-18 of the annual percentage changes in MFP. It shows that the average MFP growth rate was between 0.4% and 1.0% per annum over the most recent six years. Then that average dropped to around 0.3% per annum from 2006-07, before returning to the range 0.6% to 1.0% per annum when examining averages over 23 years or more.

In the graph below, on the horizontal axis, 1 corresponds to the 2017-18 year only, 11 corresponds to the eleven-year period 2006-07 to 2017-18, and so on.

Figure E.1 Average of annual MFP changes (%)

Data source: IPART analysis of Productivity Commission MFP data from 2019 Productivity Bulletin

Table E.1 below presents average annual MFP growth over various time horizons ending with 2017-18.

114 Productivity Commission (2019) *PC Productivity Bulletin* May 2019.

115 While productivity estimates are available for the combined energy and water utility sector, we prefer to examine productivity changes across the entire Australian economy. The productivity of the energy sector has been impacted by market restructuring, and policy uncertainty for the past twelve years.

Table E.1 Annual MFP growth, economy-wide, selected averaging periods to 2017-18 (%)

	5 years	10 years	20 years	40 years
Selected 12 industries	0.70	0.42	0.65	0.82
Economy wide	0.74	0.54	0.57	0.68

Source: IPART analysis of Productivity Commission MFP data from 2019 Productivity Bulletin

We observe similar averages for the economy-wide MFP growth, and the MFP growth for the 12 selected industry and 16 selected industry market sector groups presented in the Productivity Commission's bulletin. The 12 industry group has a longer historical data series available than the 16 selected industry group (Box E.1 shows which industries are in the different groups).

The Productivity Commission states that the most accurate estimates of productivity are for the market sector industry groups — where prices are set and therefore easier to value output. The four industries in the non-market sector (eg Public administration and safety, and Health care and social assistance) are more difficult to measure outputs.

The MFP is a more holistic indicator than labour productivity

We consider that MFP is a more appropriate indicator of the potential productivity improvements for a water utility than labour productivity. MFP captures the effect of capital productivity as well as labour productivity. Both are important to capital intensive businesses like water utilities.

The 'all industries' data is a better reflection of potential efficiency gains than the 'utilities' sector

While the 'utilities' industry sector seems similar in profile to the water utilities, the negative rates of productivity growth shown in Table E.2 (below) are probably not reflective of an efficient frontier. Rather, they likely reflect the particular issues that have been experienced in Australia over these time frames, especially in the energy sector, which has seen significant restructuring and is not considered to be performing well. For this reason, we consider that whole-economy indicators of MFP growth are more indicative of an efficient production possibility frontier.

For comparison, Table E.2 below presents MFP growth in Australia over selected time periods for 'all industries' and for 'utilities'.

Table E.2 MFP growth, selected industries, selected time periods (average annual %)

Industry	8 years - 2003-04 to 2011-12	6 years - 2011-12 to 2017-18	2017-18
'Utilities' - Electricity, gas, water and waste services	-3.83	-0.42	-1.74
All industries	0.01	0.7	0.44

Source: Productivity Commission, 2019 Productivity Bulletin, Figure 1.7.

What is an appropriate time period to look at when determining a continuing efficiency adjustment?

We consider that a figure of between 0.6% and 0.8% per annum is consistent both with recent averages and much longer-term productivity averages.

The period of low average productivity growth in-between recently and the longer-term is influenced by poor MFP results in the period before and immediately after the Global Financial Crisis. Table E.2 indicates that between 2003-04 and 2011-12, average annual MFP growth was only 0.01%. This period of low productivity growth may reflect turmoil in financial markets rather than the productivity that would be expected in more normal circumstances. We consider it is the reason that the 10 year averages shown in Table E.1 are so much lower than averages over shorter and longer periods.

Box E.1 Industry coverage used

Market sector (12 industries)	**Market sector (16 industries)**
Agriculture, forestry & fishing	Market sector (12 industries) plus
Mining	Rental, hiring & real estate services
Manufacturing	Professional, scientific & technical services
Electricity, gas, water & waste services	Administrative & support services
Construction	Other services
Wholesale trade	
Retail trade	**Non-market sector (4 industries)**
Accommodation & food services	Public administration & safety
Transport, postal & warehousing	Education & training
Information media & telecommunications	Health care & social assistance
Financial & insurance services	Ownership of dwellings
Arts & recreation services	

Source: Productivity Commission, *2019 Productivity Bulletin*, Box A.1, p 49

F Capital Expenditure decisions

This appendix details how we made our draft decisions on Sydney Water's capital expenditure for the 2016 determination period and 2020 determination period, and the asset lives we apply when including capital expenditure in the Regulated Asset Base (RAB). It describes how we considered Atkins' observations and recommendations on Sydney Water's capital expenditure program.

F.1 Capital expenditure over the 2016 determination period

Overall, Atkins found Sydney Water's capital expenditure in the 2016 determination period to be prudent, subject to minor adjustments totalling $27 million. These include:

1. A write-off of $14.6 million to the BxP IT project as a result of changes to program actual expenditure over the 2016 period[116],
2. A reduction of $9 million to the waterway health program, a stormwater service, to reflect actual expenditure and a correction to its program code.[117]

F.1.1 Reduced expenditure reflecting write-off of $14.6 million to the BxP IT project

Sydney Water has declared $14.6 million as written off in the 2016-20 determination period as this expenditure did not add to the productive capital base, due to changes to its IT program and scope. We agreed with Atkins' finding and Sydney Water's decision (subsequent to its pricing proposal) to treat the expenditure in this way.

Atkins challenged Sydney Water to demonstrate that $14.6 million is the appropriate amount to write off and that it should not be higher. Sydney Water explained that the financial statements have been through the annual audit process by the Auditor-General for New South Wales and have been signed off as giving a true and fair view of the financial position and financial performance for 2017, 2018 and 2019. The corresponding documentary evidence was supplied to Atkins. Whilst the Independent Auditor's Report is a high level document and it does not reference a level of detail relating to individual items of expenditure such as this write-off, Atkins found that Sydney Water has acted in good faith by recognising some expenditure has been imprudent and in its own words is making "a self-imposed prudency adjustment.

We accepted Atkins' recommendation.

116 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 232.
117 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 336.

F.1.2 Reduced expenditure on the waterway health program to reflect actuals

The Stormwater – Water Health Program aims improve the health of waterways managed by Sydney Water by reducing the quantities of pollutants discharged to waterways, reduce runoff, increase native vegetation, increase populations of key fauna, improve customer satisfaction, and improve amenity and use of waterways.

Sydney Water forecasts that it will only deliver half of the 2016 determination capital expenditure total on this program of $19 million. It identifies the following reasons for this underspend:

- Deferral of work due to capping expenditure under this program ($5 million impact).
- Schedule delays due to greater time for negotiation, planning and reporting and working with Local Councils who key stakeholders as many works are delivered jointly ($4 million impact).

As a result, Atkins recommended expenditure over the 2016 determination period to reflect the revised level of actual expenditure. We accepted Atkins recommendation.

F.2 Capital expenditure over the 2020 determination period

Sydney Water proposed $5,087 million in base capital expenditure for the 2020 determination period. This represents an increase of $1,837 million (39%) from Sydney Water's actual/forecast expenditure over the 2016 determination period, and an increase of $2,614 million (51%) over the allowance we set for the same period.[118]

Sydney Water also proposed $368 million in cost pass-through expenditure over the 2020 determination for network upgrades as a result of a potential expansion of the Sydney Desalination Plant.[119]

Atkins recommended reducing Sydney Water's base capital expenditure by $935.4 million to $4,151.8 million[120]. In making its recommendation, Atkins made a number of adjustments including:

- Specific adjustments to Sydney Water's proposed capital programs.
- An adjustment to reflect continuing efficiency improvements.

Akins accepted Sydney Water's proposed cost pass-through expenditure of $368 million.

We accepted Atkins' recommended adjustments to Sydney Water's proposed capital expenditure for the 2020 determination period. Our draft decision over the 2020 determination period by service are shown in Table F.1. Our rationale for these adjustments are described in the following sections. No adjustment has been made to the corporate service, other than for continuing efficiency improvements.

118 IPART analysis.
119 Sydney Water update to 1 July Price Proposal, 12 November 2019, p 19.
120 Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2.

Table F.1 Our draft decision on base efficient capital expenditure for the 2020 determination, by service ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's base proposal	1,533	1,201	1,205	1,149	5,087
Adjustments by service					
▼ Water	(417)	(52)	(86)	(22)	(577)
▼ Wastewater	6	(57)	(75)	(140)	(266)
▼ Stormwater	2	(4)	(3)	(4)	(9)
▼ Corporate	-	-	-	-	-
Total before efficiency target	(410)	(113)	(164)	(166)	(852)
Efficiency					
Continuing efficiency	(9)	(17)	(25)	(31)	(83)
Total efficient base capital expenditure					
Total	**1,114**	**1,071**	**1,016**	**952**	**4,152**
% Variance	*(27.3)*	*(10.8)*	*(15.7)*	*(17.1)*	*(18.4)*

Note: Total's may not add due to rounding.
Source: Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, Table 6-40; Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2

F.3 Efficiency adjustment – our draft decision

As with operating expenditure, we have previously considered applying efficiency factors to utilities' forecast capital expenditure where appropriate. This includes:

- **Catch-up efficiency** - this is the efficiency 'gap' between an individual company within the industry and the efficiency frontier.
- **Ongoing efficiency** – this represents the frontier shift, the efficiency savings that even a perfectly efficient firm would make with assumed productivity gains over time.

In reviewing Sydney Water's efficiency, Atkins:

1. Reviewed a number of Sydney Water's expenditure programs, for operational and capital works. In its review, where appropriate, it has recommended specific 'bottom-up' adjustments to reflect any inefficiencies it found.
2. Took a broader analysis of the business, combining the insights from its review of specific programs, with benchmarking of comparable firms. This benchmarking focused on regulated Australia water utilities, but to the extent possible, included the UK water sector. After this analysis, it decided whether to apply a 'catch-up efficiency adjustment'. In this case, Atkins did not recommend a catch-up adjustment.
3. Applied a continuing efficiency adjustment. This reflects that a business operating at the efficient frontier would continuously become more efficient over time. Atkins recommended a 0.8% per annum efficiency adjustment to operating and capital expenditure.

As discussed in Chapter 3, and in Appendix E, we have applied an adjustment of 0.8% per annum consistently across operating and capital expenditure. In arriving at this figure, we have weighed our assessment of short and long-term productivity in Australia, and Atkins' assessment that Sydney Water has been fairly efficient.

One of our considerations in deciding on a 0.8% efficiency factor was multi-factor productivity (MFP) in the Australian economy. As MFP includes all inputs, including both operating and capital costs, we consider that this factor should apply to capital expenditure, as well as operating expenditure. As such, our draft decision is to apply a 0.8% per annum efficiency factor to Sydney Water's capital expenditure program over the 2020 determination period.

Table F.1 details the impact of a 0.8% annual continuing efficiency adjustment applied to Atkins recommended efficient capital expenditure allowance for Sydney Water, with a total reduction of $83 million over the 2020 determination period.

F.4 Water service – specific adjustments

Sydney Water proposed $1,399 million in capital expenditure over the 2020 determination period for its water service, which represents an increase of 101% compared to its estimated spend in the current determination period.[121]

Atkins reviewed Sydney Water's water service capital expenditure program and found $806.1 million to be prudent expenditure. This represents an increase of around 15.7% compared to Sydney Water's estimated spend in the current determination period.[122]

Atkins made specific adjustments to the following five programs within the water service capital expenditure program:

- General growth
- Prospect to Macarthur
- Water pumping station renewal
- Reservoir renewals and reliability
- Meter replacements

The following table details each of the adjustments over the 2020 determination period and the following sections provide detailed analysis of Atkins' findings.

We accepted Atkins' recommendations.

121 Sydney Water Sydney Water update to 1 July Price Proposal, 12 November 2019; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

122 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, Table 6-36; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

Table F.2 Water service – our draft decision on specific adjustments to capital expenditure for the 2020 determination ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's base proposal	632.1	261.3	293.3	212.6	1,399.3
Adjustments					
▼ General growth	(12.0)	(15.9)	(15.8)	(12.1)	(55.9)
▼ Prospect to Macarthur	(399.5)	(22.8)	(62.0)	-	(484.2)
▼ Water pumping station renewal	(4.1)	(4.2)	(3.0)	(2.8)	(14.1)
▼ Reservoir renewals and reliability	-	(7.6)	(3.4)	(6.0)	(16.9)
▼ Metering adjustment	(1.5)	(1.5)	(1.5)	(1.5)	(6.0)
Total adjustments	(417)	(52)	(86)	(22)	(577)
Efficiency					
Continuing efficiency	(1.7)	(3.3)	(5.0)	(6.1)	(16.1)
Total efficient base capital expenditure – *Water service*					
Total	**213.3**	**206.0**	**202.6**	**184.1**	**806.1**

Source: Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-1.

General growth adjustment

Rates of new development in the 2016-20 period have been at unprecedented levels. Sydney Water sets out in Attachment 8 of its submission a number of reasons why development is expected to be lower than current levels. These reasons include declining dwelling approvals and housing-related lending. Despite this, Sydney Water has:

- projected a very similar average number of new connections in the 2020 determination period as during the current period, and
- proposed a significantly large growth program of $642.7 million over the 2020 determination period, which represents a 108% increase in average water growth expenditure compared to its expenditure in the 2016 period.

Taking Sydney Water's own analysis, Atkins consider it reasonable that water growth capex should be at a similar average level to actual expenditure over the 2016-20 period. Atkins state that they were not given a compelling justification for the scale of increase requested.

We accepted Atkins' recommendations.

Sydney Water have stated that the increase in growth expenditure is partly because the share of growth taking place in "greenfield areas" will be higher than in previous periods, and the cost of servicing properties in these areas is higher than compared to infill development.

In providing feedback to our draft decisions, we would consider any quantitative information that Sydney Water can provide to support these statements.

Prospect to Macarthur adjustment

Atkins undertook a review of the projects in light of the recent change in conditions and recommend:

- All future expenditure on the Prospect to Macarthur Link (that is, all forecast expenditure for the 2020 period) be deferred, because:
  - Deferring this scheme allows time for a comprehensive drought response and long term supply-demand plan to be developed.
  - Dam storages are significantly in excess of (more than double) the construction trigger set out in the current drought options study.
  - There are benefits, in present value terms, of deferring this expenditure.
- All expenditure for the Blue Mountains scheme remains efficient, because it significantly increases the resilience of a part of Sydney Water's network, and the options study undertaken was robust.

Our draft decision is to accept Atkins' recommendation.

Water pumping station renewal scope

Sydney Water's proposed expenditure on its water pumping station renewals program over the 2020 determination is above long term averages from 2012.

Atkins found that the available performance information and asset risk information does not provide justification for such a large increase in expenditure on water pumping station renewal from 2012 into the forward period. Therefore, Atkins recommend that expenditure for water pumping station renewal be reduced to be in line with average annual expenditure from 2016 – 2020.

We accepted Atkins' recommendations.

Reservoir renewals and reliability

The program is a continuation of the 2016-20 program which involves the renewal of reservoir roofs, relining of walls and renewal of some mechanical / electrical equipment including re-chlorination facilities, valves, mixers and instrumentation. The program over the 2020-24 determination period also includes major project works at Erskine or Potts Hill reservoirs.

Atkins found Sydney Water's investment prioritisation process for reservoirs does not appear to follow the established consequence of failure (CoF) and condition assessment analysis and appears to be at a lower level of maturity overall than other asset classes.

Atkins have partially accepted Sydney Water's proposed increased expenditure. Atkins accepted the need to increase expenditure beyond current levels due to the significant Potts Hill renewal project that is planned to be undertaken, and recognised the expenditure for 2021 has been largely agreed and committed so have maintained this at the level of Sydney Water's proposed with some expenditure deferred to enable prioritisation of work.

However, Atkins took a portfolio level assessment to recommend subsequent expenditure on reservoir renewals is maintained at current levels. Atkins also recommend the ongoing risk-based approach to prioritisation of expenditure be applied to this program.

We accepted Atkins' recommendations.

Metering adjustment

Atkins found that the new and replacement meter program is appropriate and conventional procurement has been used to seek market costs. It questions the achievability of the increased proactive replacement program given the contractual difficulties experienced in the 2016 determination period and the near 30% increase in activity proposed by Sydney Water. Atkins found a more realistic program would be to continue at the current rate plus 10%. This corresponds to a $6.0m ($1.5m per annum) reduction in expenditure spread equally over the four years, based on the proactive replacement rates.

We accepted Atkins' recommendations.

F.5 Wastewater service – specific adjustments

Sydney Water proposed $3,103 million in capital expenditure over the 2020 determination period for wastewater services, which represents a 67% increase compared to its estimated spend in the current determination period.[123]

Atkins reviewed Sydney Water's wastewater service capital expenditure program and recommends $2,781 million to be an efficient allowance. This represents an increase of around 52% compared to Sydney Water's estimated spend in the current determination period.[124]

Atkins made specific adjustments to the following programs within the wastewater service capital expenditure program:

- Wet Weather Overflow Abatement program
- Critical and Non-Critical Mains Renewals
- Quakers Hill and St Marys wastewater treatment plant
- Wastewater treatment plant renewals
- Richmond/North Richmond Amplification
- Upper South Creek Expenditure
- General growth
- Wastewater pumping station civil works

The following table details each of the adjustments over the 2020 determination period and the following sections provide detailed analysis of Atkins' findings.

We accepted Atkins' recommendations.

123 Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

124 Atkins/Cardno, Addendum to Final Report – Expenditure Review of Sydney Water, Table 3-2; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

F.3 Wastewater service – our draft decision on specific adjustments to capital expenditure for the 2020 determination ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's base proposal	721.5	766.2	791.2	824.3	3,103.1
Adjustments					
▼ General growth	(46.0)	(42.4)	(56.1)	(35.7)	(180.2)
▼ Critical and Non-Critical Mains Renewals	(33.4)	(34.9)	(32.5)	(31.9)	(132.7)
▼ Wet Weather Overflow Abatement program	(9.2)	(10.7)	(10.9)	(9.5)	(40.3)
▼ Wastewater treatment plant renewals	(18.0)	11.1	7.3	(19.2)	(18.8)
▼ Richmond/North Richmond Amplification		(4.1)			(4.1)
▼ Quakers Hill and St Marys wastewater treatment plant	14.1	-	-	-	14.1
▼ Wastewater pumping station civil works	5.0	5.0	5.0	5.0	20.0
▼ Upper South Creek Expenditure	93.2	19.4	12.1	(48.9)	75.9
Total adjustments	5.7	(56.6)	(75.1)	(140.2)	(266.2)
Efficiency					
Continuing efficiency	(5.8)	(11.4)	(17.2)	(21.9)	(56.2)
Total efficient base capital expenditure – *Wastewater service*					
Total	**721.4**	**698.2**	**698.9**	**662.2**	**2,780.7**

Source: Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, Table 6-39.

General growth adjustment

Similar to water service expenditure, Sydney Water is projecting a very similar average number of new connections in the 2020 determination period as during the current period. Given this, Atkins consider it reasonable that wastewater growth capex should be at the average level incurred over the 2016 period. Atkins state that they were not given a compelling justification for the scale of increase requested.

Atkins have recommended an adjustment to proposed water expenditure to match the average expenditure in the 2016-20 period. This adjustment has been applied pro-rata to Sydney Water's proposed expenditure for 2021-24.[125]

We accepted Atkins recommendations.

Critical and Non-Critical Mains Renewals scope and efficiency

Sydney Water's forward program for renewals was largely based on a bottom-up build-up of activities costed through historic unit rates. These bottom-up programs of work have been subject to a top-down efficiency challenge.

125 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 188.

There is a significant variance in how Sydney Water applied efficiency challenges across its major capital programs. While most programs are clustered around the average level efficiency challenge of 18%, no efficiency was applied to the critical sewers program. Atkins notes that this program is only in its infancy and that greater efficiencies are likely to be realised in less mature programs such as this.

We recognise the environmental performance and compliance risks that Sydney Water is working towards improving, but consider it important to separate out compliance risk and the risk of delivering efficiently. Atkins accept the need to address compliance risk and that expenditure needs to be adjusted to reflect this risk and apparent deteriorating performance. We do not agree that addressing this risk extends to achieving efficient delivery.

Further, Atkins observed that Sydney Water has spent considerable time moving towards a new procurement model that it has designed to deliver the forward program efficiently. During expenditure interviews with Atkins, Sydney Water also outlined that it considers that there is adequate market capacity to deliver the increased program. Atkins states that the critical sewer renewals program is also non-complex technically, repeatable and an area in which new innovations are emerging. Thus, Atkins cannot see a reason for why Sydney Water would not be able to, or should not aim to, achieve the same level of efficiencies it expects to achieve in other areas of its program.[126]

On this basis, Atkins recommend a specific catch-up efficiency adjustment for the critical sewers program, to reach the average 18% level that Sydney Water have applied themselves for the remainder of their asset renewals programs.[127]

We accepted Atkins recommendations.

Wet Weather Overflow Abatement program efficiency

Sydney Water and the Environmental Protection Authority (EPA) are in agreement that addressing wet weather overflow risk through source control presents good value for money to the community and can drive significant environmental improvement over large geographic areas. This will be the focus of the 2020-24 period across three priority catchments. After Sydney Water had submitted its July 2019 pricing proposal, the EPA has outlined their intent to impose a more stringent improvement level which would require additional funding and source control work to occur across five catchments, instead of three.

Sydney Water proposed total expenditure of $172 million in its July 2019 pricing proposal which was based on an internally approved business case finalised in June 2019. At the time of the June submission three priority catchments were identified with source control projects chosen as the primary focus of abatement. These projects corresponded to 40 EPA credit points for investment which manages environmental impact through an offset regime. These projects involve $141 million expenditure out of the total $172 million ($31 million is for other wet weather overflow abatement activities). Subsequent to submitting its July 2019 pricing proposal and following further discussions with the EPA, it was mandated that Sydney Water are required to achieve 60 credit points within the 2020-24 regulatory period.

126 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 206.
127 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 247.

In its November update to its pricing proposal, Sydney Water detailed that an additional $52 million of capital expenditure would be required to achieve the additional 20 credit points.

Atkins reviewed the cost and benefit 'credit points' of the 40 point and 60 point programs. Specifically, Atkins challenged Sydney Water regarding the decreasing marginal cost of addressing the wet weather overflows – the additional 20 points are only three-quarters of the cost of the first 40 points, ($2.6 million per point compared with $3.5 million per point). The implication is that the initially proposed 40 point program is less value for money than the revised program 60 point. Sydney Water responded that the 40 point program was focused on larger catchments which were prioritised because of their size. Initial work has since provided better estimates of the costs of abatement works which has led to the estimates of the revised program.

Notwithstanding the above evaluation of the marginal incremental costs of achieving additional credit points, Atkins consider that the original program of work based on 40 points was not challenged from an efficiency perspective by Sydney Water. The building block component projects of the program were not finalised at the time of Atkins' initial review.

As this target is now an environmental obligation and mandated by the EPA, from a prudency perspective, Atkins have not provided an opinion on the need for the activity to be undertaken. However, Atkins observed that Sydney Water appear to be on the back foot in terms of planning and procurement for the projects. As such, program efficiencies are expected to be made once a more detailed procurement strategy has been developed and the market tested. The reduced marginal cost of the additional works (a 25% reduction on the original program) supports that there are likely efficiencies to be gained by further development of the delivery of this program.

Atkins have therefore made a program level efficiency adjustment of 18% to bring the efficiency challenge in line with other major programs. Atkins explicitly state this recommendation does not suggest any changes in scope, outputs or increase in performance risk sharing by Sydney Water. Similar to Atkins' recommendation on the critical sewers program, Sydney Water has the ability to find efficiencies in delivery without reducing scope.[128]

We accepted Atkins' recommendations.

Wastewater treatment plant renewals

Atkins found that renewals expenditure for this asset class has been significant over the last ten years and Sydney Water have demonstrated performance improvements across a range of measures. As a result, Atkins do not see a need to increase expenditure over and above levels in the current determination period.

Atkins formed the view that the proposed increased expenditure in the 2020 determination period does not appear to be delivering any greater performance benefits. As such, Atkins recommend a programme level adjustment to smooth the expenditure profile, and maintain expenditure in line with the current period.[129]

128 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 208-209.
129 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, pp 198-199.

Richmond/North Richmond Treatment Capacity Increase

This project relates to increasing the wastewater treatment capacity in Richmond and North Richmond in the North West of Sydney to deal with growth in the catchment and to improve the quality of the treated effluent.

An options appraisal was completed in 2015 but is currently being revisited in the light of the Hawkesbury Nepean Nutrient Framework (HNNF) which means that treated effluent will need to achieve lower nutrient levels.

The proposed project consists of two stages:

- Stage 1 – capacity upgrade, which involves decommissioning the existing North Richmond WWTP, a transfer from North Richmond WWTP to Richmond WRP and amplification of Richmond WRP. The GSIP envisages completion in 2022.
- Stage 2 – which is to upgrade the quality of the treated effluent to meet load limits by upgrading the tertiary denitrification process. It is envisaged this will be complete in 2023.

The total proposed capital expenditure over the 2020 determination period is $96.6 million. However, the project is at a reasonably early stage of definition. Atkins observed that a technology comparison has not yet been done for the plant. Sydney Water is preparing an options analysis business case.

Atkins was informed by Sydney Water during expenditure interviews that the costing in the 2017 needs analysis business case is based on the 2012 cost estimation tool, with escalation applied and scope added for Stage 2. Atkins did not find a clear reason for why the proposed capex ($96.6 million) is greater than the capex in the needs analysis business case (NABC - $92.5M). Atkins recommend an adjustment of $4.1 million to the expenditure to match the NABC.[130]

We accepted Atkins' recommendation.

Quakers Hill and St Marys wastewater treatment plant variation

Atkins reviewed the Delivery Approval Business Case (DABC) against the financial information provided by Sydney Water in its July 2019 pricing proposal and observed that the forecast for this program was underestimated.

As such, Atkins have proposed a 30% proportional adjustment **increase** in expenditure ($14.1 million in 2020-21) to reflect the shortfall not included within the 1 July pricing submission and efficiencies that may yet be realised within the overall program.[131]

We accepted Atkins' recommendation.

130 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, pp 213-214.
131 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 194 and Table 6-39.

Wastewater pumping station civil works

Sydney Water's proposal includes no expenditure for civil works (dry wells and wet wells) across its wastewater pumping station (WWPS) assets. Atkins found this very surprising given the likelihood that some of these assets would fail or be near failure during the forward period. When challenged by Atkins, Sydney Water expressed its view that the better information it has gained since responding to a failure of a Northmead pumping station suggests that expenditure on WWPS civil asset is highly likely in the forward period.

Atkins found that the emergent need for Level 2 condition inspections (and possibly Level 3) and the highly likely scope of civil works arising undermines Sydney Water's stated understanding of it risk across the WWPS asset class. Given better information on the condition of the civil assets and comparing to the long term trend, Atkins state it is likely that a different program would have been proposed reflecting a step change in expenditure.

Atkins recommend an adjustment to Sydney Water's expenditure forecasts for the forward period of $5 million per annum to account for the works arising from the more detailed condition assessments.[132]

We accepted Atkins' recommendations.

Upper South Creek Expenditure

Sydney Water is proposing to build a single treatment plant to service the Upper South Creek growth area. Atkins found that the total proposed capital expenditure of the Upper South Creek project is similar to Sydney Water's previous proposal to construct two separate treatment plants. Sydney Water is also now proposing to bring the expenditure forward significantly; increasing the proposed spend in the 2020 determination period by $143.1 million.

Atkins' review found that at this stage, and subject to ongoing monitoring of outturn development in the areas to be serviced, the proposal to construct a new treatment facility is efficient. However, the project is at an early stage and the need to pass through Infrastructure NSW's gateways means that Atkins was not convinced that expenditure will be undertaken on the timescales proposed by Sydney Water.

Atkins have made a number of adjustments to reflect this view, including:

- Land purchase happens in 2021 rather than 2020.
- Some of the construction of the 42Mld tertiary treatment takes place in 2026 rather than completing in 2025.
- A third of the RO treatment and brine transfer takes place in 2025 rather than 2024.
- Effluent transfer capex takes place a year later than forecast by Sydney Water in 2025 and 2026.[133]

We accepted Atkins' recommendations.

132 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 199.
133 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 212.

F.6 Stormwater service – specific adjustments

Sydney Water proposed $185.2 million in capital expenditure over the 2020 determination period for its stormwater services, which represents an increase of 85% compared to its estimated spend in the current determination period.[134]

Atkins reviewed Sydney Water's stormwater service capital expenditure program and found $172.4 million to be an efficient allowance. This represents an increase of around 72% compared to Sydney Water's estimated spend in the current determination period.[135]

Atkins made specific adjustments to two programs within the stormwater service capital expenditure program:

- Stormwater renewals, and
- Waterway health.

The following table details each of the adjustments over the 2020 determination period and the following sections provide detailed analysis of Atkins' findings.

We accepted Atkins' recommendations.

Table F.4 Stormwater service – our draft decision on specific adjustments to capital expenditure for the 2020 determination ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's base proposal	40.1	53.7	43.3	48.0	185.2
Adjustments					
▼ Stormwater Renewals	-	(5.8)	(4.6)	(5.4)	(15.8)
▼ Waterway health	1.6	1.6	1.6	1.6	6.5
Total adjustments	2	(4)	(3)	(4)	(9)
Efficiency					
Continuing efficiency	(0.3)	(0.8)	(1.0)	(1.4)	(3.5)
Total efficient base capital expenditure – *Stormwater service*					
Total	**41.4**	**48.8**	**39.4**	**42.8**	**172.4**

Source: Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, Table 6-40

Stormwater renewals

Total stormwater expenditure on renewals to meet existing mandatory standards was $68 million in the 2016 determination period. Sydney Water proposed expenditure of $154 million in the 2020 determination period representing a 127% increase on total expenditure in the current determination period. Atkins found that Sydney Water had underspent on renewals to meet existing mandatory standards in the current period by

134 Sydney Water Sydney Water update to 1 July Price Proposal, 12 November 2019; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

135 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, Table 6-40; Sydney Water, Annual Information Return to IPART, November 2019, Total Capex for Water projects and programs.

around $31 million; due to delays reaching agreement with councils and works reprioritisation.

Atkins formed the view that, overall, expenditure levels as in the 2020 period should be increased to a certain extent, particularly for at risk projects. Atkins observed that Sydney Water's prioritisation of expenditure has worked effectively in the current period and maintaining a focus on project prioritisation should be continued into the future period and risk reprioritisation undertaken periodically to efficiently deploy resources.

Atkins supported increasing expenditure relative to the current period to reduce the asset risk profile and recommended including committed expenditure for projects in the active phase as well as some expenditure for minor renewals projects and planning. Atkins had some reservations over the efficiency of all of the proposed investment, particularly in the later years of the program where projects are less well defined or scoped, and recommended deferring some expenditure and commensurate outputs into the next determination period. Overall, Atkins recommended a 10% reduction to the capital expenditure proposed by Sydney Water between 2021 and 2024, a total reduction of $15.8 million.[136]

We accepted Atkins' recommendations.

Waterway health

The primary driver for the Waterway Health Program is to improve the health of waterways managed by Sydney Water. The 2019-23 operating licence makes specific reference to Sydney Water having authority, but not being required, to manage the impacts of stormwater on waterway health.

Sydney Water's customers have indicated a willingness to pay for improved waterway health, in a willingness to pay study undertaken by Sydney Water specific to the activities and outcomes of the waterway health program. While this WTP study was undertaken, it did not inform the final level of investment in the waterway health program. Instead, the program was subject to a 40% reduction as part of the overall top-down "efficiency" challenge. Sydney Water stated that the wider results of this study were not used to set the total level of investments because the results were not available in sufficient time to inform the program and the trade-offs in between benefits and costs between the waterway health program and other programs could not be undertaken with sufficient rigour.

Atkins found it surprising, notwithstanding the time constraint, that Sydney Water has selected a lower level of investment than apparently supported by its customers, and stated that[137]:

> Sydney Water will miss an opportunity to deliver value to its customers.

Atkins formed the view that reducing the level of investment appears incongruous with the 'options analysis' in the program business case which tested the impact of a reduction in the proposed scope of the program by 10%. The options analysis by Sydney Water concluded that this adjustment would result in increased risks to the environment and reputation and an

136 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 219.
137 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 220.

overall move in the risk profile from 'medium' in the base case (program as proposed) to 'high' under the option of a 10% reduced scope.

Atkins found that the nature of this 'efficiency' challenge is also different to what has been applied to other programs. The efficiency challenge here includes a scope reduction through deferral. The efficiency challenge for other projects and programs are intended that the same scope be delivered net of the efficiency challenge to the estimated expenditure.

Atkins recommend that the $6.5 million of expenditure deferred by Sydney Water be considered prudent in the 2020 determination period, representing an increase in expenditure on this program relative to Sydney Water's proposal.[138]

We accepted Atkins' recommendations. Given the customer support for this program and Sydney Water's greater confidence in the costs and benefits of delivery gained in the current period, we consider that the deferral of expenditure is not justified. As discussed further in Chapter 13, we consider there is an opportunity for Sydney Water in future determinations to expand its Waterways health investments to reflect the community's willingness to pay for improved environmental outcomes.

F.7 Asset lives

Table F.5 outlines our proposed asset lives for existing and new assets.

138 Atkins/Cardno, Final Report – Expenditure Review of Sydney Water, p 221.

Table F.5 Sydney Water's proposed and IPART recommended asset lives

	Expected lives of new assets[a]		Remaining lives of existing assets[b]	
	Our draft decision	Sydney Water proposed	Our draft decision	Sydney Water proposed
Corporate				
Civil	67.6	67.6	59.0	59.6
Electrical	10.0	10.0	8.4	8.4
Mechanical	8.0	8.0	3.1	3.3
Electronic	10.0	10.0	5.0	6.3
Water (excluding Recycled Water)				
Civil	130.1[c]	140.0/40.0/80.0[d]	93.7	94.2
Electrical	28.5[c]	30.0/12.0/21.0[d]	19.7	20.5
Mechanical	35.6[c]	40.0/15.0/21.0[d]	29.9	30.1
Electronic	15.0[c]	15.0/5.0/15.0[d]	6.4	6.4
Wastewater				
Civil	90.0	90.0	77.7	78.5
Electrical	25.0	25.0	15.5	16.8
Mechanical	25.0	25.0	14.6	16.0
Electronic	15.0	15.0	8.7	10.3
Stormwater				
Civil	150.0	150.0	121.8	120.7
Electrical	25.0	25.0	na	na
Mechanical	25.0	25.0	na	na
Electronic	15.0	15.0	na	na

i Including capital expenditure for finance lease assets.

j Excluding finance leases, which are depreciated on a straight-line basis from 1 July 2016 at the 2016 depreciation rates.

k Weighted average of expected lives for finance lease assets and other assets (weighted by forecast capital expenditure).

l Expected lives for non-finance lease capital expenditure and the two finance leases with capital expenditure, ie Macarthur and Prospect.

Note: The 15 year asset life for electronic water assets is consistent with the weighted average of Sydney Water's proposed assets lives for water and water finance lease assets. The apparent inconsistency arises due to rounding.

Source: Sydney Water's Pricing Proposal, July 2019 and IPART calculations

We agreed with Sydney Water's proposal to continue to use the 2016 determination expected asset lives for new assets. To incorporate capital expenditure for finance leases into the water RAB, we have calculated a weighted average expected life for the water asset categories (weighted by forecast capital expenditure).

Treat finance leases consistently with other RAB assets

Sydney Water's finance lease assets were incorporated into a separate RAB at the 2016 price review. The opening RAB values for two of the four leases (the Prospect and Macarthur WFPs) incorporated estimated amounts of capital expenditure for upgrades. (That is, historical RAB values included future capital expenditure forecasts for the 2016 determination period.) Sydney Water has revised capital expenditure for actual capital expenditure over the 2016 determination period, and the revised amounts have been included in Atkins' expenditure review.

Our draft decisions are to:

- Accept Sydney Water's proposed 1 July 2016 opening values for finance lease capital expenditure.
- Adopt common asset lives for all future capital expenditure, as asset ownership – ie, whether an asset is leased or not – should not affect the asset lives we apply to capital expenditure.
- Include the capital expenditure, recommended by our consultants, in Table F.6 below, for capital expenditure on WFP upgrades.

Table F.6 Sydney Water's proposed and Atkins' recommended capital expenditure on finance lease assets ($ million)

	2016-17 nominal	2017-18 nominal	2018-19 nominal	2019-20 nominal	2020-21 $2019-20	2021-22 $2019-20	2022-23 $2019-20	2023-24 $2019-20
Sydney Water proposed								
Macarthur WFP	-	0.3	4.1	16.7	1.2	-	-	0.1
Prospect WFP	2.3	5.3	3.0	28.2	46.1	76.9	59.5	18.5
Total	2.3	5.6	7.1	44.8	47.4	76.9	59.5	18.5
Our draft decision								
Macarthur WFP	-	0.3	4.1	16.7	1.2	-	-	0.1
Prospect WFP	2.0	4.5	2.5	24.0	39.2	65.3	50.5	15.7
Total	2.0	4.8	6.6	40.6	40.4	65.3	50.5	15.7

Note: Totals may not sum due to rounding.

Source: Sydney Water Annual Information Return July 2019 and IPART calculations

G NRR inputs

This appendix outlines how we calculated some inputs to the NRR. It explains our decisions on:

- The value of the RAB
- The tax allowance
- The working capital allowance, and
- Adjustments to the NRR.

G.1 Value of the regulatory asset base (RAB)

The RAB represents the value of Sydney Water's assets on which we consider it should earn a return on capital and an allowance for regulatory depreciation.

In calculating the opening RAB, we rolled forward the RAB we set in the last determination period and carried this forward to include our draft decisions on capital expenditure and depreciation. The steps we took were to:

- Add prudent and efficient capital expenditure (see Chapter 3)
- Deduct cash capital contributions (explained below)
- Deduct the regulatory value of asset disposals (explained below)
- Deduct the regulatory depreciation we allowed at the 2016 Determination and for the next period, and
- Added the annual indexation of the RAB.

Our decisions on the RAB are set out in Table G.1 and Table G.2 below, with a comparison of our decision on the RAB values that Sydney Water proposed.

We present our analysis and decisions regarding the treatment of historical cash contributions and asset disposals below the tables.

Table G.1 Draft decision on RAB roll-over for 2015-16 and the 2016 determination period (nominal $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20
Opening RAB	14,825.9	15,357.9	16,486.0	17,257.4	18,014.3
Plus: adjustment[a]	0.0	526.8	0.0	0.0	0.0
Plus: capital expenditure	674.7	597.8	774.5	821.5	966.5
Less: cash capital contributions (net of tax)[b]	0.0	0.6	1.0	7.3	0.0
Less: asset disposals	17.5	9.4	39.0	0.6	1.9
Less: allowed regulatory depreciation[c]	276.6	293.8	317.1	339.4	365.5
Plus: Indexation	151.5	307.4	353.9	282.6	462.4
Closing RAB	**15,357.9**	**16,486.0**	**17,257.4**	**18,014.3**	**19,075.8**
Sydney Water's proposal (closing)	15,360.0	16,496.9	17,275.7	18,039.9	19,103.9
Difference ($)	(2.1)	(10.9)	(18.3)	(25.6)	(28.1)
Difference (%)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)

a The adjustments include the addition to the RAB of the four finance lease ($501 million) and an amount for the Rouse Hill capital expenditure ($26 million).

b At the 2016 determination the Tribunal decided to subtract cash capital contributions net of tax instead of including tax on these contributions in the tax allowance

c Allowed deprecation from the 2016 determination, adjusted for inflation

Note: Totals may not add due to rounding.

Source: Sydney Water, Pricing Proposal 2020-24, July 2019; and IPART calculations

Table G.2 Draft decision on RAB for the 2020 Determination period ($2019-20 $millions)

	2020-21	2021-22	2022-23	2023-24
Opening RAB	19,075.8	19,817.4	20,508.0	21,100.2
Plus: capital expenditure[a]	1,154.5	1,136.1	1,066.4	966.9
Less: cash capital contributions (net of tax)	2.3	2.3	2.3	2.3
Less: asset disposals	1.9	1.9	1.9	1.9
Less: allowed regulatory depreciation	408.6	441.3	470.0	488.8
Closing RAB	19,817.4	20,508.0	21,100.2	21,574.1
Sydney Water's proposal (closing RAB)	20,287.4	21,133.2	21,943.1	22,628.3
Difference ($)	(470.0)	(625.2)	(842.9)	(1,054.2)
Difference (%)	(2.3)	(3.0)	(3.8)	(4.7)

[a] This represents our draft decision on the efficient level of capital expenditure. Chapter 4 for details on how we assessed this.

Note: Totals may not add due to rounding.

Source: Sydney Water, Pricing Proposal 2020-24, July 2019; and IPART calculations

G.1.1 Cash capital contributions

Cash capital contributions that a utility receives from third parties towards its capital expenditure, such as government grants, are netted off capital expenditure (ie, they do not enter the RAB). This ensures that customers do not pay a return on assets or regulatory depreciation for capital expenditure that the utility has already had funded from other sources.

However, utilities would normally need to pay tax on capital contributions. We deduct the cash contributions net of tax from the capital expenditure allowance, effectively capitalising the tax impact on capital contributions into the RAB.

Historical cash capital contributions

Prior to 2008, the main source of cash capital contributions for Sydney Water was from developer charges. However, on 17 December 2008, the NSW Government set water and sewerage developer charges to zero for both these utilities. As a result, the amount to be deducted from capital expenditure due to cash capital contributions is minor.

Sydney Water reported $8.8 million in cash capital contributions[139] for the 2016 determination period. We have adjusted the RAB for the cash capital contribution amounts shown in Table G.3.

[139] Net of applicable tax allowance, $nominal.

Table G.3 Draft decision on historical cash capital contributions deducted from the RAB ($million, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Cash contributions (gross of tax)	0.0	0.8	1.4	10.4	0.0	12.6
Cash capital contributions (net of tax)	0.0	0.6	1.0	7.3	0.0	8.8

Note: The table presents the total cash contributions for water, sewerage and stormwater.

Source: Sydney Water 2018-19 Annual Information Return, July 2019.

Future cash contributions

Given the Government's policy of zero developer charges for Sydney Water and Hunter Water, the amounts of cash capital contributions is forecast to be small. For the 2016 Sydney Water price review, we used the historical average over a 4-year period as our forecast of cash capital contributions. Our draft decision is to continue to adopt this methodology for the 2020 determination period.

For the 2016 determination period, Sydney Water forecast zero cash capital contributions but in fact received $12.6 million. Sydney Water has forecast zero cash capital contributions for the 2020 determination period. Given the experience over the 2016 determination period, we consider it more appropriate to use the 4-year historical average (2015-16 to 2018-19) as the forecast.

Using the historical average over the 2015 16 to 2018-19 period amounts to an annual cash capital contribution of $3.2 million ($2019-20). Our draft decision is to use the forecast cash capital contributions presented in Table G.4.

Table G.4 Draft decision on forecast cash capital contributions for Sydney Water ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Cash contributions (gross of tax)	3.2	3.2	3.2	3.2	13.0
Cash contributions (net of tax)	2.3	2.3	2.3	2.3	9.1

Note: The table presents the total cash contributions for water, sewerage and stormwater. Total may not sum due to rounding.

Source: Sydney Water 2018-19 Annual Information Return, IPART calculations.

G.1.2 Adjustments for asset disposals

Asset disposals can include asset sales, write-offs and write-downs. The value of any regulatory assets Sydney Water disposed of during the 2016 determination period, as well as any assets it proposes to dispose of during the 2019 determination period, are deducted from the RAB. This ensures customers are not charged a return on assets or regulatory depreciation for assets that are no longer used to provide regulated services.

We applied our 2018 asset disposals policy[140] in this review to deduct asset disposals from the RAB. Under this policy, we regard disposals as significant if they attract capital gains tax or account for more than 0.5% of the opening RAB value of the relevant service in the year in which the disposal occurred. The key principles of our disposal policy are provided in Box G.1.

Box G.1 IPART's asset disposal policy

Under IPART's asset disposal policy, we categorise asset sales and asset write-offs into significant or non-significant disposals. Significant disposals represent more than 0.5% of opening value of the RAB in the year in which the disposal occurs. For example, if a water asset is sold for more than 0.5% of the opening RAB for water assets, it would be considered a significant asset disposal.

- Significant asset write-offs are assessed on a case by case basis.
- The treatment of significant asset sales depends on whether the assets are pre line-in-the sand or post line-in-the-sand.
  - Pre-line-in-the-sand: regulatory values to be deducted from the RAB are estimated by multiplying the sale values by the RAB to DRC (depreciated replacement costs) ratio at the time the initial RAB value is established.
  - Post-line-in-the-sand: we estimate the regulatory value of the assets sold, based on the information available to us. For example, by tracking actual capex.
- For non-significant asset write-offs, we do not deduct any value from the RAB, except as deemed necessary on a case by case basis.

For non-significant sales, we deduct the sales values from the RAB, net of efficient sales costs.

Historical asset adjustments

Table G.5 provides a summary of our recommended deductions from Sydney Water's RAB for historical asset disposals.

Table G.5 Draft decision on values to be removed from Sydney Water's RAB for the 2016 determination period ($ million, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20 [a]	Total
Non-significant disposals	0	0	0	0	0	0
Significant sales	17.2	9.1	13.2	0.6	1.9	42.1
Significant write-offs	0.3	0.3	25.8	0	0	26.4
Total	**17.5**	**9.4**	**39.0**	**0.6**	**1.9**	**68.5**

Note: The table presents the total asset sales for water, wastewater and stormwater.

a 2019-20 is a forecast.

Source: Sydney Water 2018-19 Annual Information Return (October) and IPART calculations

How we determined the values for non-significant disposals, significant sales and write-offs is detailed below.

140 IPART's asset disposal policy – for water businesses, February 2018.

Non-significant disposals

We accepted Sydney Water's nil non-significant asset disposals over the 2016 determination period.

Significant historical asset sales

Within Sydney Water's fixed asset register, properties are categorised as either operational or non-operational and as surplus[141] and non-surplus land assets. The surplus land assets are made available for sale or alternative use[142].

All of Sydney Water's historical asset disposals to be deducted from the RAB are sales of surplus land. Sydney Water forecast that the proceeds from operational land sales net of sales cost is $103 million and compares to $237 million of total asset disposals forecast for the period 2015-16 to 2019-20 for the 2016 price determination (presented in Table G.6). This represents a 57% reduction of land sales over that period.

Table G.6 Sydney Water's land sales for the 2016 determination period ($ million, $2019-20)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Total forecast land sales for 2016 price determination	97.1	73.7	21.9	21.9	21.9	236.5
Total actual land sales (net of costs)	48.1	20.9	27.6	1.5	4.6[a]	102.6
Difference	-49.0	-52.8	5.7	-20.5	-17.4	-133.9

Note: The table presents the total asset sales for water, wastewater and stormwater.

a 2019-20 is a forecast.

Source: Sydney Water 2018-19 Annual Information Return (October) and IPART calculations

Sydney Water has proposed that actual land sales with regulatory value of $8.4 million not be deducted from the RAB on the grounds that the land was non-operational on 1 July 2000. In response to IPART's request for further information, Sydney Water has provided satisfactory evidence that, of the $8.4 million in land sales, $3.9 million was non-operational when the RAB was established on 1 July 2000. These (non-operational) sites contained assets that had been decommissioned before 1 July 2000 and have been vacant since then.

In line with our 2018 asset disposals policy, the intention is that, for regulatory purposes, 'non-operational' land means the land was surplus to both existing *and planned future* requirements on 1 July 2000. Our draft decision is not to remove from the RAB $3.9 million of non-operational land.

Table G.7 presents our draft decision on the land sales values to be removed from the RAB for the 2016 determination period.

141 Sydney Water states that surplus land assets are "assets which we own but are not integral to the delivery of our services." Sydney Water's Pricing Proposal, July 2019, Attachment 11: Proposed revenue requirement, p23.

142 Such as for bio banking.

Table G.7 Draft decision on land sales values to be removed from the RAB for the 2016 determination period ($ million, nominal)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Sydney Water proposal	15.4	8.5	39.0	0.3	0.8	64.0
Add RAB value of operational land disposed in 2016 period	2.1	0.9	0.0	0.4	1.2	4.5
Recommended disposals	17.5	9.4	39.0	0.6	1.9	68.5

Note: Totals may not sum due to rounding

Source: Sydney Water confidential information, Sydney Water's Pricing Proposal, July 2019 and Sydney Water's update to 1 July Price Proposal, November 2019 and IPART calculations

Significant historical asset write-offs

Sydney Water has a large asset write-off in 2017-18 of $25.8 million ($2017-18) for its Customer Management System (CMS).[143] This is considered a significant write-off under our policy,[144] which means it is assessed on a case-by-case basis. This write-off was considered at the 2016 Sydney Water Price Review by Cardno Atkins. It recommended that the corporate electronic assets RAB, in 2017-18, be reduced by $24.8 million ($2015-16). Sydney Water's proposed asset write-off, and the value of this write-off, is consistent with our Final Decision in the 2016 Review.

Forecast asset adjustments

Sydney Water forecasts no non-significant disposals and no asset write-offs over the 2020 determination period. Its forecast asset disposals are all significant asset sales.

Sydney Water predicts that the majority of its surplus land will be sold by July 2020. It has therefore forecast a general property disposal amount of $5 million ($2019-20) per annum (or $4.6 million of net sales) for the 2020 determination period.[145] Sydney Water assumes that this is the amount of operational assets that will become surplus and available for sale each year. Applying our asset disposal policy, the amount to be deducted from the RAB is $1.9 million ($2019-20) per annum (which is $4.6 million x 42%[146]).

We consider this forecast reasonable and our draft decision is to adopt this value for the 2020 determination period (see Table G.8). The forecast asset disposals will be amended for the actual disposals for the period at the next price review.

143 Sydney Water's Pricing Proposal, July 2019, Attachment 11: Proposed revenue requirement, p25.
144 This write-off accounts for about 3.8% of the average corporate RAB value for 2017-18.
145 Sydney Water's Pricing Proposal, July 2019, Attachment 11: Proposed revenue requirement, p26.
146 Under our asset disposal policy for Sydney Water pre-line in the sand assets, the regulatory value of an asset is assumed to equal 42% of the sale value.

Table G.8 Draft decision on values to be removed from Sydney Water's RAB for the 2020 determination period ($ million, $2019 20)

	2020-21	2021-22	2022-23	2023-24	Total
Non-significant disposals	0	0	0	0	0
Significant sales	1.9	1.9	1.9	1.9	7.7
Significant write-offs	0	0	0	0	0
Total	1.9	1.9	1.9	1.9	7.7

Note: Totals may not sum due to rounding

Source: Sydney Water 2018-19 Annual Information Return (October); IPART analysis

G.1.3 Allowed regulatory depreciation

Regulatory depreciation aims to recover the cost of an asset over its useful life. To calculate the regulatory depreciation, we typically divide the value of assets by their expected lives. For simplicity, we do this at an aggregated level.

We have applied a straight line depreciation and the asset lives set out in Appendix F to calculate the allowed regulatory depreciation.

G.2 Return on capital

Our return on assets allowance is equal to the value of the RAB in each year of the determination period multiplied by an appropriate rate of return. As for previous reviews, we have determined the rate of return using an estimate of the WACC.

For the WACC decision, we applied our published methodology. Appendix H sets out the parameters that we used.

Our draft decisions have resulted in lower return on capital than Sydney Water had proposed. This follows from our draft decisions that resulted in a lower RAB but mostly, from the lower WACC.

Table G.9 Comparison of our draft decision on return on assets, and Sydney Water's proposal ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposal	741.7	780.2	811.7	840.1	3,173.7
Our draft decision	**619.0**	**642.1**	**662.7**	**679.8**	**2,603.6**
Difference ($)	(122.7)	(138.1)	(149.0)	(160.3)	(570.1)
Difference (%)	(16.5)	(17.7)	(18.4)	(19.1)	(18.0)

Note: Totals may not sum due to rounding

Source: Sydney Water 2018-19 Annual Information Return (October); IPART analysis

G.3 Allowance for tax

Our tax allowance is not intended to recover Sydney Water's actual tax liability over the determination period. Rather, it reflects the liability that a comparable commercial business would be subject to. Including this allowance is consistent with our aim to set prices that reflect the full efficient costs a utility would incur if it were operating in a competitive market (including if it were privately owned). It is also consistent with the principle of competitive neutrality, that is, that a government business should compete with private business on an equal footing and not have a competitive advantage due to its public ownership.

We applied our standard methodology to set the tax allowance. We calculate the tax allowance for each year by applying the relevant tax rate, adjusted for the value of imputation credits (the 'gamma'), to the business's (nominal) taxable income. For this purpose, taxable income is the notional revenue requirement (excluding tax allowance) less operating cost allowances, tax depreciation, and interest expenses. As part of calculating the appropriate tax allowance, the business is required to provide forecast tax depreciation for the determination period. Other items such as interest expenses are based on the parameters used for the WACC, and the value of the RAB.[147]

The tax allowance is one of the last building block items we calculate, due to its dependence on other items such as operating cost allowances and WACC parameters.

To establish the tax allowance, we:

- Adopted a 30% tax rate, because the NRR for Sydney Water is above the small business tax threshold of $50 million per annum.
- Accepted Sydney Water's forecast tax depreciation but updated it to reflect our decisions on capital expenditure
- Accepted Sydney Water's forecast non-cash contributions (or AFOC).

Our tax allowance is lower than Sydney Water's proposed tax allowance, mainly due to a lower WACC. Table G.10 presents our draft decision on the tax allowance.

Table G.10 Comparison of our draft decision on tax allowance and Sydney Water's proposal ($millions, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water proposal	79.1	64.5	64.5	77.6	285.7
Our draft decision	**85.3**	**68.2**	**73.1**	**83.1**	**309.7**
Difference ($)	6.2	3.7	8.6	5.5	24.0
Difference (%)	7.8	5.8	13.3	7.1	8.4

Source: Sydney Water 2018-19 Annual Information Return (October); IPART analysis

G.3.1 Forecast tax depreciation

Tax depreciation is an input into the tax calculation. IPART's policy for businesses that pay tax or tax equivalents is to use the tax deprecation amounts forecast by the businesses when

147 The nominal cost of debt is the sum of the nominal risk free rate and nominal debt margin.

we calculate the tax allowance.[148] This approach means that our tax depreciation reflects actual business practice (eg, actual tax depreciation rates and depreciation methods).

Sydney Water's forecast tax depreciation amounts incorporate depreciation on:

- Existing assets
- Forecast capital expenditure, and
- Assets free of charge (AFOC).

We have reviewed Sydney Water's proposal and accepted its approach to forecasting tax depreciation with the exception that we have amended the depreciation on forecast capital expenditure to reflect our draft decision rather than Sydney Water's proposed amount. This is presented in Table G.11.

Table G.11 Comparison of Sydney Water's proposed tax depreciation and our recommendation ($ millions, nominal)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposal	497.2	567.7	622.1	624.0	2,311.0
Our draft decision	**462.8**	**534.6**	**563.7**	**563.0**	**2,124.1**
Difference ($)	(34.4)	(33.1)	(58.5)	(61.0)	(186.9)
Difference (%)	(6.9)	(5.8)	(9.4)	(9.8)	(8.1)

Source: Sydney Water's Pricing Proposal, July 2019, Sydney Water's update to 1 July Price Proposal, November 2019 and IPART calculations

G.3.2 Forecast assets free of charge (AFOC)

Assets Free of Charge (AFOC) (also known as non-cash capital contributions) are assets that utilities receive for free. AFOC does 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 AFOC. As such, we need to include forecast AFOC as revenue in the calculation of the regulatory tax allowance building block.

Sydney Water has forecast annual AFOC for the 2020 determination period as the actual annual average over the 2015-16 to 2018-19 period (indexed for inflation) plus an amount to recoup the holding costs of the differences between forecast and actual AFOC over the 2016 determination period. This is consistent with the approach adopted by IPART for the 2016 determination period (see Box G.2).

148 IPART, *The-incorporation-of-company-tax-in-price-determinations, Other Industries – Final Decision*, December 2011, pp 17-18.

Box G.2 Sydney Water's AFOC for the 2016 determination period

In 2012, Sydney Water indicated that accurate forecasts of AFOC were difficult, given its unpredictability. Sydney Water proposed to use the average of the previous five years of actual AFOC, adjusted for inflation, for its forecasts. We accepted Sydney Water's proposal.

In its 2016 pricing proposal, Sydney Water changed in the way it forecast AFOC. Its new approach was based on two components; one for urban development (ie growth) and the other for major infrastructure (based on available information on scheduled projects by private companies and government agencies). However, the Secretariat had concerns with Sydney Water's AFOC forecast methodology including that it effectively predicted more AFOC lots than new connections.

As a result, the Tribunal decided to use a forecast AFOC based on a four year historical average, to coincide with the length of the regulatory period. Further, the Tribunal decided to pass through the holding costs of differences between actual and forecast AFOC over the 2016 determination period, at the next determination period. This approach ensures that Sydney Water recovers its AFOC related tax obligations, albeit with a lag.

The Tribunal undertook to "test Sydney Water's (2016) forecast methodology more thoroughly at the 2020 determination".[a] However, for the 2020 determination period Sydney Water has adopted the Tribunal's 2016 methodology.

a IPART *Review of prices for Sydney Water Corporation, From 1 July 2016 to 30 June 2020, Water — Final Report* June 2016, p135.

Table G.12 shows Sydney Water's proposed forecast AFOC, totalling $799 million, for the 2020 determination period. Our draft decision is to accept Sydney Water's proposed AFOC.

Table G.12 Assets free of charge for Sydney Water ($million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Water	71.8	61.3	61.3	61.3	255.7
Wastewater	147.3	122.7	122.7	122.7	515.4
Stormwater	8.6	6.4	6.4	6.4	27.8
Total	**227.7**	**190.4**	**190.4**	**190.4**	**798.9**

Source: Sydney Water's Pricing Proposal, July 2019 and Sydney Water's update to 1 July Price Proposal, November 2019

G.4 Allowance for working capital

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

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

   Net working capital = receivables – payables +inventory +prepayments

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

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

Table G.13 below provides a comparison of our draft decision with Sydney Water's proposal.

Table G.13 Comparison of our draft return on working capital allowance to Sydney Water's proposal ($2019-20, $million)

	2020-21	2021-22	2022-23	2023-24	Total
Sydney Water's proposal	7.5	9.9	10.3	11.0	38.7
Our draft decision	**9.3**	**10.3**	**10.8**	**11.4**	**41.8**
Difference ($)	1.8	0.4	0.5	0.4	3.1
Difference (%)	23.5	4.3	4.5	3.8	7.9

Note: Totals may not sum due to rounding

Source: Sydney Water 2018-19 Annual Information Return (October); IPART analysis

The sections below details the parameters applied to calculate our allowance for working capital.

G.4.1 Parameters for receivables

The value of receivables depends on the average number of days between providing a service and receiving payment for that service, which we calculate with reference to

- The net number of days that access and usage charges are billed in arrears, which in turn depends on
  - the number of days in the billing cycle
  - the average number of days that access charges are billed in advance of services being delivered,[149] and
  - the proportion of revenue derived from access charges (if billed in advance).
- The number of days of delay between reading the meter and receiving payment.

Sydney Water has a three monthly billing cycle and the majority of its customers pay access charges in advance. Based on this information, Sydney Water proposed a 91 day billing cycle and an average of 63 days of access charges billed in advance (and 28 days in arrears). We consider these proposals are reasonable.

However, for the reasons discussed below, our draft decision is that we do not accept Sydney Water's proposed

- proportion of revenue from access charges, and
- 'days of delay' between reading the meter and receiving payment.

149 Usage charges are always billed in arrears, after the meter has been read. Many utilities, including WaterNSW also bill access charges in arrears.

Revenue derived from access charges

Sydney Water proposed that we apply a uniform 56% of revenue derived from access charges to water, sewerage and stormwater, rather than the proportion applicable to each service individually (eg, about 15% for water and 100% for stormwater). The benefit of their proposed approach is that it avoids negative working capital for stormwater.[150] However, it means that the working capital allowance is 'smeared' across the services and does not reflect the working capital requirements of each service individually. Our draft decision is to calculate the proportion of revenue derived from access charges separately for each service, based on forecast revenue.

Days of delay

Sydney Water proposed 39 'days of delay', comprised of the following four items:

1. a 21 day notice period for bill payment
2. two days of delay in bank payments being transferred to Sydney Water's account
3. seven days before the late payment fee is applied, and
4. six[151] days to account for customers on payment plans or who are not on payment plans but pay their bills late due to financial difficulties and for whom penalty charges are waived (eg, late payment fees and interest on overdue accounts). Sydney Water estimates that this applies to about 10% of customers, who have an average repayment period of 87 days.

We consider items 1, 2 and 4 are reasonable, but disagree with item 3 because, by including the seven additional days before the late payment fee is applied, Sydney Water is (implicitly) assuming that all customers pay only seven days after the notice period. We recommend that we do not allow any additional days to account for this seven day grace period, because

- many customers pay by direct debit on the due date, and
- some of the remaining customers are likely to pay before the due date, offsetting customers who pay up to seven days after the due date.

Table G.14 sets out Sydney Water's proposed and our recommended average number of days of delay between reading the meter and receiving payment.

150 Working capital for stormwater will be negative because customers provide working capital in their upfront payments, and creditors (ie, suppliers) provide working capital because the utility receives services before the paying its suppliers (payables).

151 In its original proposal, Sydney Water had double counted the days of delay between when the meter is read and when payment is due for customers granted extended payment periods without penalty. In response to a query by IPART, Sydney Water has revised down its proposed 'days of delay' by three days (from nine to six).

Table G.14 Sydney Water's proposed and our draft decision on days of delay

	Proposed number of days	Recommended number of days
Notice period for bill payment	21	21
Delay in bank payments being transferred to Sydney Water's account	2	2
Days (after notice days) before late payment fee is applied	7	0
Additional delay due to late payment due to financial difficulty without late payment penalty	6	6
Total days of delay between reading the meter and receiving payment	**36**	**29**

Source: Sydney Water, *Pricing proposal 2020-24, Appendix 11A Working capital allowance*,1 July 2019, p4 and IPART calculations

G.4.2 Parameters for payables

We calculate payables using a benchmark number of days of delay between receiving a good or service and making a payment. Sydney Water has proposed 30 days, which is the standard contract period and which we use as our default number of days.

G.4.3 Parameters for inventory

We set inventory to be a constant real dollar amount over the forecast period, based on efficient business practice.

Sydney Water's proposed inventory amount of $16.6 million ($2019-20) is based on their "improved stock take processes"[152] and is similar to their actual inventory in 2017-18. We consider this reasonable and our draft decision is to accept Sydney Water's proposed inventory amount.

G.4.4 Parameters for prepayments

We set prepayments to be a constant real dollar amount over the forecast period. However, we set the value to zero unless the business can demonstrate that the pre-payments are prudent and efficient.

Sydney Water proposed a prepayment of $9.6 million per year ($2019-20) based on efficient business practice, including prepaid IT licences and maintenance, insurance, rent and land tax. The proposed amount is similar to actual pre-payments in 2018-19 as reported in the AIR. We consider this reasonable and our draft decision is to accept Sydney Water's proposed prepayment amount.

[152] Sydney Water, *Pricing proposal 2020-24*, *Appendix 11A Working capital allowance*,1 July 2019, p6.

G.5 Revenue adjustments for non-regulated revenue

We encourage water utilities to seek ways to generate revenue in ways other than from traditional services, for instance, through renting some of its land. Where it does this by using assets that have been paid for by the customers of the traditional services, we typically share this revenue with the customers that have paid for the asset.

Sharing the revenue encourages the utilities to pursue non-regulated revenue while ensuring customers also benefit from the arrangements because they pay for the assets. In the past, we have typically applied a 50:50 sharing ratio of the revenue.

Our draft decision on customers' share of non-regulated revenue is shown in Table G.15 below.

Table G.15 Draft decision on Sydney Water's revenue adjustments ($ million, $2019-20)

	2020-21	2021-22	2022-23	2023-24	Total
Blue Mountains CSO	0.1	0.1	0.1	0.1	0.2
Recycled water revenue[a]	2.2	2.2	2.2	2.2	8.8
Customer share (50%) of rental income	5.0	4.6	4.4	4.4	18.4
Customer share (10%) of Biodiversity Offset Scheme income	1.0	0.4	0.2	0.5	2.1
Total recommended amount deducted from NRR	**8.2**	**7.3**	**6.8**	**7.1**	**29.5**

a This is revenue from s16A recycled water schemes and includes the additional $50,000pa to Sydney Water to reflect the 50% share of the revenue from its least cost recycled water schemes (see Chapter 10).

Note: The table presents the total NRR deductions for water, wastewater and stormwater. Totals may not sum due to rounding.

Source: Sydney Water 2018-19 Annual Information Return (October) and IPART calculations.

Our draft decision is to continue to share 50% of non-regulated revenue with customers, with the exception of the two sources of revenue below:

- Revenue from least-cost recycled water schemes where the recycled water displaces potable water (See Chapter 10).
- Revenue from bio banking credits (explained below).

We note that Sydney Water has proposed sharing 10% of its non-regulated revenue from rental income with customers, however our draft decision is to maintain our standard 50% policy for this item. We also discuss this below.

How we treat revenue from bio-banking credits

In its proposal, Sydney Water's forecast revenue from bio-banking credits is $20.8 million over the 2020 determination period, and proposes to share 10% of this revenue with customers.[153] The Scheme aims to offset impacts of development and land clearing by securing and managing offsetting sites, which generate biodiversity credits which can then be purchased by developers to offset their biodiversity impacts.

153 Sydney Water's Pricing Proposal, July 2019, Attachment 11: Proposed revenue requirement, p32

The Property Council of Australia supported a non-regulated revenue sharing ratio of 10% with customers from Sydney Water's participation in the Biodiversity Offset Scheme.

Our treatment of revenue from participation in the bio-banking scheme differs from our usual approach to non-regulated revenue. Comparatively, a smaller proportion is shared with customers. This recognises that Sydney Water would bear non-negligible scheme participation costs (such as setup and ongoing costs) and responsibilities of the scheme that create increased revenue risk. Scheme participation requires set up costs, as well as enters the business into perpetual agreements with ongoing costs and responsibilities. A biodiversity Conservation trust is established and funded through the first sales of biodiversity credits.

In May 2018, we communicated to Sydney Water about its participation in Biodiversity Offset Schemes. Our response covered three items, as follows:

- **Treatment of the land in the RAB**: If the land was operational at the RAB creation in 2000, but had since become non-operational, then its value should be removed from the RAB. Alternatively, if the land either is still operational, or if was non-operational in 2000, then there would be no change to the RAB.
- **Costs recovered through the scheme, or avoided because of participation in the scheme**: Operational costs, common corporate overheads, or land tax associated with the managing the land should no longer be recovered from customers, as these should either be recovered through annual repayments through the Biodiversity Conservation Trust, or are avoided by entering the Scheme (eg, land tax). We would remove these costs from the regulated cost base where identification is simple, and the utilities should provide an estimate of these costs.
- **Revenue from selling credits**: The utility could retain 90% of the revenue from credit sales due to the additional costs from participating in the scheme, such as setup and ongoing costs and responsibilities that create increased risk for the utility. 10% of the revenue should be shared with customers, by removing it from the NRR when setting prices.

Our draft decision for this review, is that to assess the efficient costs of participating in the Scheme, and then calculate the net revenue to be shared with customers, would be an unnecessary burden on the business and on IPART (particularly given we do not regulate this service). Thus, as long as the costs of Sydney Water participating in the scheme are ring-fenced from customers, we accept Sydney Water's proposal to share 10% of the revenue with customers.

Rental income

Sydney Water proposed to share 10% of non-regulated revenue from rental income with customers, justifying the decision by claiming it creates 'consistent' treatment across its non-regulated revenue income. This proposal is a deviation from our historical 50:50 rental income sharing ratios.

In its response to our Issues Paper, Sydney Water reiterated its opposition to a 50:50 sharing ratio for rental income, citing the economic principles from our 2008 decision and subsequent

regulatory decisions in the Asset Disposals and Biobanking policies.[154] The two policies outline that customers should be made no worse off by the generation of non-regulated revenues, and should (at minimum) be compensated equal to the incremental costs of providing the non-regulated services using the regulated assets paid for by customers through prices. In Sydney Water's view, according to these principles, so long as a customer is fully compensated, they bear no risk associated with the non-regulated service and should not share in non-regulated revenues.

Sydney Water claims that applying a sharing ratio to total incremental revenue is a poor efficiency incentive, meaning it bears all the risk if incremental costs are more than incremental revenue.

Conceptually, we acknowledge Sydney Water's concern that a 50:50 revenue sharing ratio with customers does not protect it from the risk that costs may account for greater than 50% of the revenue generated. However, in the case of rental activities, we consider it highly unlikely that significant incremental costs would be incurred in earning this revenue, and recommend maintaining a 50:50 revenue sharing ratio. In addition, a 50:50 sharing ratio provides a protection to customers should any costs or asset depreciation arising from rental activities be inadvertently recovered from Sydney Water's future costs.

Other adjustments

In addition to the adjustments outlined above, Sydney Water has two other adjustments to the NRR: for the Blue Mountains customer service obligation (CSO) and recycled water revenue. Some unsewered properties in the Blue Mountains receive a subsidy from Sydney Water for a septic pump-out service and Sydney Water receives full funding from the Government for this subsidy. Because Sydney Water has included the cost of this service and of Section 16A recycled water schemes in its regulated expenditure, we deduct these items from the NRR before setting prices.[155] We have also provided an additional $50,000pa to Sydney Water to reflect 50% share of the revenue from its least cost recycled water schemes (see Chapter 10).

154 In our Final 2008 decision, we decided to adopt a 50:50 sharing ratio for rental income (having previously subtracted all the revenue from rental income from the NRR in our draft decision). Our 2008 decision highlighted that a 50:50 sharing ratio balances providing an incentive for Sydney Water to pursue rental income opportunities, against passing some of the benefits to customers. See IPART, *Review of prices for Sydney Water Corporation's water, sewerage, stormwater and other services*, June 2008, pp 36-37.

155 That is, our recommended treatment of Section 16A recycled water revenue and expenditure ensures that the broader customer base funds the difference between the efficient cost of the scheme, and the revenue generated from customers of the scheme.

H Weighted Average Cost of Capital

This appendix shows the parameters we used to calculate the draft weighted average cost of capital (WACC), and explains our decision about how to treat annual changes in the WACC with regard to customer prices.

H.1 Our WACC estimate

Our WACC estimate is set out in Table H.1 below. In keeping with our standard WACC method, we adopted current market observations for the cost of debt, inflation and the market risk premium. We adopted the following industry-specific parameters:

- Gearing ratio of 60%.
- Equity beta of 0.7.

Table H.1 Sydney Water WACC for draft report

	Step 1		Step 2 – Final WACC range		
	Current market data	Long term averages	Lower	Midpoint	Upper
Nominal risk free rate	1.20%	3.10%			
Inflation	2.30%	2.30%			
Implied Debt Margin	1.80%	2.60%			
Market Risk premium	8.8%	6.0%			
Debt funding	60%	60%			
Equity funding	40%	40%			
Total funding (debt + equity)	100%	100%			
Gamma	0.25	0.25			
Corporate tax rate	30%	30%			
Effective tax rate for equity	30%	30%			
Effective tax rate for debt	30%	30%			
Equity beta	0.70	0.70			
Cost of equity (nominal post-tax)	7.4%	7.3%			
Cost of equity (real-post tax)	4.9%	4.9%			
Cost of debt (nominal pre-tax)	3.0%	5.7%			
Cost of debt (real pre-tax)	0.7%	3.3%			
Nominal Vanilla (post-tax nominal) WACC	4.7%	6.3%	4.7%	5.5%	6.3%

Post-tax real WACC	2.4%	3.9%	2.4%	3.2%	3.9%
Pre-tax nominal WACC	5.6%	7.2%	5.6%	6.4%	7.2%
pre-tax real WACC point estimate	3.2%	4.8%	3.2%	4.0%	4.8%

H.2 Gearing and beta

In selecting proxy industries, we consider the type of business the firm is in. If we can't directly identify proxy firms that are in the same business, then we would consider which other industries exhibit returns that are comparably sensitive to market returns.

We propose to adopt the standard values of 60% gearing and an equity beta of 0.7. We undertook preliminary proxy company analysis on several different types of industries with risk profiles that appear similar to water utilities. The results for the electric utilities industry and the multiline utilities activity support continuing to use an equity beta of 0.7 when 60% gearing is used. While some other industries and activities analysed suggest a higher beta, the sample sizes for those proxy groupings are too small to warrant making what would be a major change from the status quo.

H.3 Sampling dates for market observations

We sampled market observations for the current year to the end of January 2020, which is the last available whole month. For earlier years in the trailing average calculation of the historic cost of debt we also sampled to the end of March in each year. We chose that date so that the Final Report WACC would sample all years in consistent months.

H.4 Tax rate

We assume that the Benchmark Equivalent Entity is a large public water utility. The scale economies that are important to firms of this type suggest that the Benchmark Equivalent Entity would be likely to be well above the turnover threshold at which a firm becomes eligible for a reduced corporate income tax rate. Therefore, we use a tax rate of 30%.

H.5 Regulatory period

We adopt a standard four year regulatory period for Sydney Water.

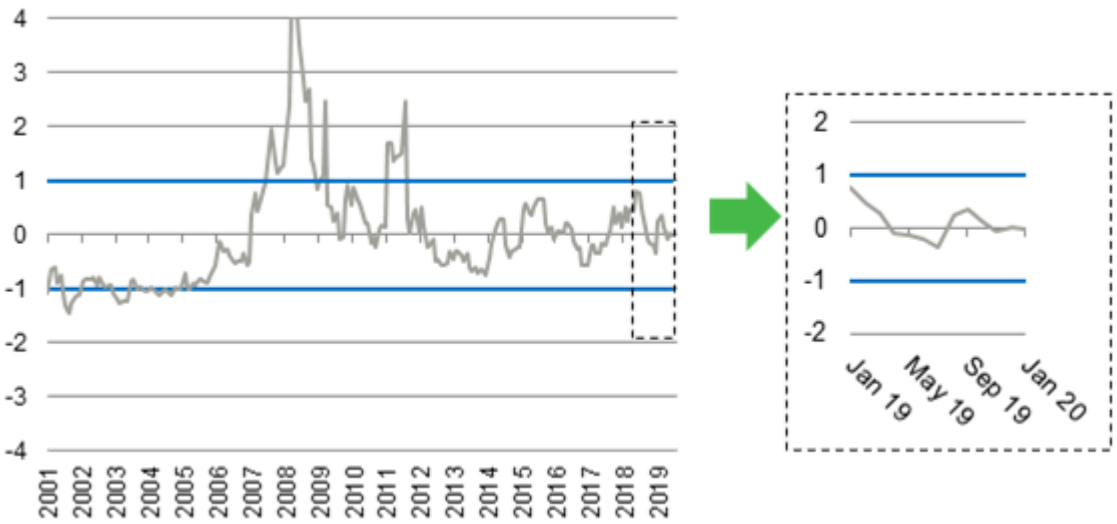
H.6 Application of trailing average method

Our 2017 WACC method introduced a decision to estimate both the long-term and current cost of debt using a trailing average approach, which updates the cost of debt annually over the regulatory period. As foreshadowed in our 2017 review of the WACC method, we employ a transition to trailing average in the calculations presented above.

H.7 Uncertainty index

We tested the uncertainty index for market observations to the end of January 2020. It was within the bounds of plus and minus one standard deviation of the long-term mean value of zero. Therefore we maintain the default 50% – 50% weighting between current and historic market estimates of the cost of debt and the cost of equity.

Figure H.1 IPART's uncertainty index



Source: Thompson Reuters, Bloomberg and IPART calculations

H.8 Annual WACC adjustments

Our 2017 review of the WACC method introduced a trailing average cost of debt. One consequence is that the WACC changes every year, as new tranches of debt are introduced to the trailing averages and the oldest tranches drop out.

We considered two options to adjust price to account for annual WACC changes:

1. To store the present value of the revenue adjustments caused by the changing WACC and apply a true-up at the next regulatory period.
2. Annual real price changes to reflect the changing WACC.

We have adopted this approach, noting that it aligns with our general preference for the end-of period true-up to avoid unnecessary price volatility to customers.

I Water usage pricing options

We decided to implement a dynamic water usage price after examining a number of different pricing options, the most significant of which are outlined below.

I.1 The status quo creates a revenue risk for Sydney Water and does not encourage customers to reduce consumption in drought

The simplest option for pricing would be to continue with our current approach. That is, to set the usage charge with reference to the long run marginal cost of providing water, with a small uplift to the usage price to reflect the operational costs of SDP. This would provide a small price signal to users that water is more valuable in times of drought.

However, the current approach has some drawbacks, including:

- It does not factor in the increasing value of water as it becomes more scarce, and thus may undervalue water in times of drought. With that said, if measured correctly, the long-run marginal cost should capture the opportunity costs of water consumption, on average.
- It creates a revenue risk, because decreases in demand resulting from water restrictions are not factored into prices. However, this can be (and currently is) managed with a demand volatility adjustment mechanism.

Therefore, we decided that a dynamic water usage price that passes through the costs of drought and signifies the value of water is more appropriate.

I.2 An inclining block tariff sends an incorrect signal about the value of water, and there is little evidence it is more equitable than other options

Under an inclining block tariff (IBT) customers are charged a lower price for water usage up to a threshold and then a higher one for any usage above that level. This would, in theory, ensure that non-discretionary water use is more affordable, but the price is higher for discretionary uses (such as filling a pool, or watering a large garden) when water is scarce. Users can then choose whether they value their discretionary water use enough to pay the higher price. IBTs are common in other major cities in Australia including Melbourne, Brisbane and Perth.

The Public Interest Advocacy Centre (PIAC) strongly supports an IBT approach. PIAC considers IPART's view that a single water usage price is efficient is based on too narrow a view of efficiency, and that an IBT is a more appropriate pricing mechanism in terms of allocative, productive, dynamic and social efficiency. They believe it allows for longer term

planning at the individual level, reflects community preferences and places risk with those best placed to manage it.[156]

However, the effectiveness of an IBT is debateable. In its 2008 working paper, IPART found that the IBT introduced in Sydney in 2005, whereby households were allocated 400kL of water at a reduced price, reduced water consumption by no more than 1.3GL.[157] Aside from whether it can reduce demand, we see two major issues with using an IBT price structure:

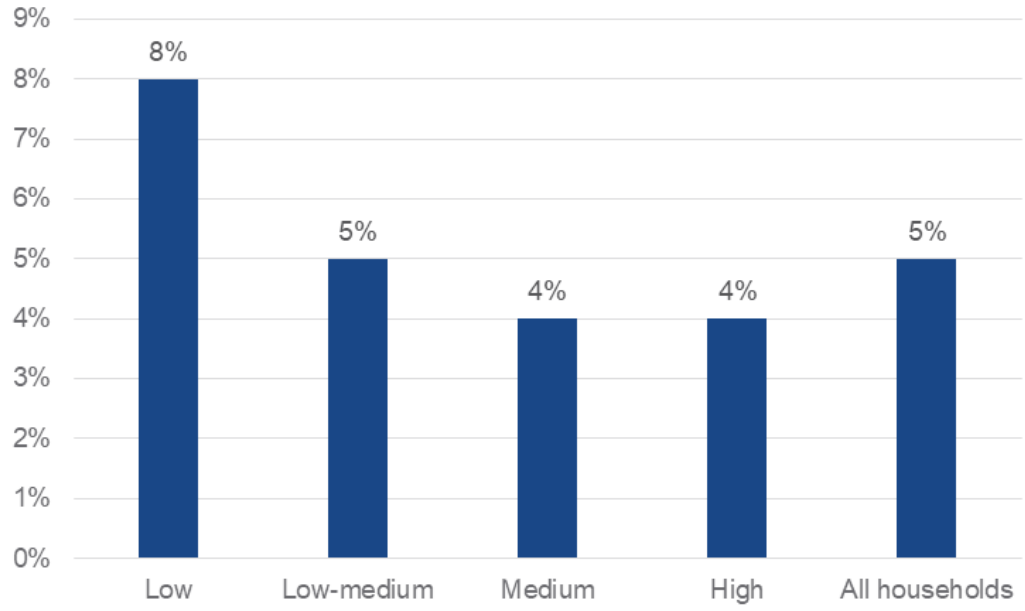
1. An IBT does not necessarily promote equity
2. An IBT is less efficient than a two-part tariff

An IBT is not necessarily equitable

We used the 2015 IPART household survey to analyse the relationship between income and water consumption. The survey contains information on over 2,000 Sydney households' annual water consumption, and divides these households' income into one of four income brackets (low income, low-medium, medium and high income).

Our analysis shows that while there is a relationship between household income and water consumption, there is also a relationship between household income and number of people in a household (in that higher income households also tend to have more people). When this is accounted for (by taking a per capita view of water consumption), there is very little relationship between income and water use (Figure I.1).

Figure I.1 Proportion of households in 'high per capita water consumption' bracket, by household income



Data source: IPART 2015 Household Survey analysis

156 Public Interest Advocacy Centre, PIAC submission, 28 October 2019, pp 2-3.
157 IPART, Water scarcity: Does it exist and can price help solve the problem? – Working Paper, January 2008.

This analysis is consistent with the more systematic regression analysis from IPART's 2015 Household Survey report, which found that household size is the key determinant of water consumption, with income only having a small and positive relationship with water consumption.

Therefore, as inclining block tiers are generally set on a per household basis rather than a per capita basis, the differential prices are unlikely to accurately target discretionary and non-discretionary uses, respectively. Larger low-income households would incur a higher charge to meet their basic water needs, with smaller high-income households paying a lower charge to meet their discretionary needs. Therefore, an IBT could result in socially inequitable outcomes because large, low income households would not be protected from high prices, while small, high income households would be.

An IBT is less efficient

As outlined in the 2008 Sydney Water price review, an IBT is also less efficient than a single usage charge (set to the long-run marginal cost of supply) because it results in at least some consumption being priced at a level either above or below marginal cost. That is, it would either result in:

- The second price tier being above LRMC. To the extent that this did actually target the discretionary use of high-income households, these households would be encouraged to invest in alternative water supply sources (eg, greywater systems) above the opportunity cost of producing an additional unit of water. And to the extent the higher price would also affect large, low-income households, it would not be equitable and still be inefficient.
- The first price tier being below LRMC. Setting prices at too low encourages the over consumption of water, and given the analysis above, might benefit small high-income households. While arguably less problematic than the first scenario, as any over-consumption would be limited by where the trigger point is for the high usage price, it would be less efficient than providing a fixed rebate to low-income households.

Therefore, we do not consider an IBT an appropriate way to send a signal about efficient water consumption, and do not support it as a way to price water usage.

I.3 Scarcity pricing is not feasible with current technology, and would lead to high bill volatility

One way to build resilience in water pricing would be to move away from LRMC-based pricing and instead to a price that balances demand against short-term supply constraints. This would improve water security by incentivising users to adjust their water consumption based on dam levels.

There is a significant body of literature supporting this scarcity pricing model, but very few examples of it being used around the world. Problems consistently identified include the inelasticity of water demand (meaning price increases need to be significant), and equity concerns about making an essential resource more expensive.

IPART's initial modelling suggests that, depending on the expected length of drought and dam levels, usage prices would need to increase up to 233% in order to restrict customer demand sufficiently to ensure that dam storages are not exhausted. This would have a significant impact on customer bills. Further, because bills are only issued quarterly, there would be a delay in customers reacting to any signals that scarcity pricing provides.

A scarcity price would make Sydney Water's revenue more volatile, in that the elasticity of water demand would lead Sydney Water to over recover on its costs during times of drought, but under recover during times of plenty. We consider this could be overcome by setting a price floor to eliminate under recovery, and some form of 'drought rebate' to offset higher usage prices in times of drought. The rebate would be issued to Sydney Water during drought, to finance additional spending required, and then returned once drought is over.

I.4 A combined water and wastewater usage price is not practical for all customers

In response to our issues paper, Professor Peter Coombes and Michael Smit submitted a novel approach to water usage pricing in Sydney. They proposed eliminating water and wastewater service charges and instead charging customers a combined water and wastewater usage charge based on geographical location (i.e. local government area).

Their model is based on the assumption that costs to supply water to customers in eastern Sydney are higher than western Sydney, while it is cheaper to treat wastewater in eastern Sydney than western Sydney. As a result, total costs should level out across the city, creating a combined price between \$5/kL and \$6/kL,[158] depending on council area.

This approach provides a very strong price signal for water usage. However, we have some concerns with this approach.

- The NSW government's postage stamp pricing policy prohibits locational pricing.
- Our analysis indicates the marginal costs of wastewater services are highly localised by catchment and cannot be generalised on an east/west divide.
- It would not be a practical approach for non-residential customers, or high use residential customers with diverse water and wastewater usage characteristics.
- A customer with high water usage may not have high sewerage discharge, especially for large non-residential customers. For example a plant nursery in western Sydney with high water usage but low sewerage usage would be paying an artificially high price for water to pay for an assumed sewerage service it does not need.
- The price does not allow customers to respond to different marginal price signals for water and wastewater augmentations.

158 Submission to IPART, October 2019.

J Sydney Water's demand forecasts

In this appendix we present more information on our water sales forecasts, Sydney Water's forecasting model, and how we estimated the elasticity of demand under drought, and non-drought conditions.

J.1 Our base water sales scenario is based on Sydney Water's forecasts

Sydney Water forecasted future water sales using an econometric model originally developed in 2011 and updated for the 2016 and 2020 price reviews. As outlined in the following section, Sydney Water predicts water sales to increase by 1.0% between 2019-20 and 2020-21 and then to grow by 1.2% a year on average between 2020-21 and 2020-24.

Our expenditure review consultants, Atkins/Cardno, also reviewed Sydney Water's demand forecasts, and recommended accepting its forecasts, assuming no change in the water usage price. They found that – as a baseline projection – Sydney Water's residential demand forecasts are robust and well-evidenced. They identified that Sydney Water's non-residential demand forecasts were not as sophisticated, and recommended:

- Accepting Sydney Water's forecasts for the 2020 determination period, in the absence of better information, and
- That Sydney Water should work to develop better estimates for the next determination.

We agree with Atkins recommendations, and have accordingly based our water sales forecasts on Sydney Water's forecasts.

However, given Sydney Water's modelling assumed the water usage price would remain constant in real terms, we applied an elasticity adjustment to Sydney Water's water sales forecast to account for the increase in the base usage charge from \$2.11/kL to \$2.30/kL. This elasticity adjustment is based on Sydney Water's estimates, and is discussed in more detail below. The elasticity adjustment reduces water sales by about 1.7% per year.

Table J.1 Draft base water sales forecast for the 2020 determination period (ML/year)

	2019-20	2020-21	2021-22	2022-23	2023-24
Sydney Water	510,378	517,568	524,342	530,732	538,727
Atkins/Cardno	N/A	517,568	524,342	530,732	538,727
Less elasticity adjustment	N/A	-9,028	-9,147	-9,258	-9,398
IPART base demand forecast	N/A	508,539	515,195	521,474	529,329

Source: Atkins/Cardno, *Sydney Water Corporation Expenditure and Demand Forecast Review*, Final Report, 29 January 2020; IPART analysis.

Sydney Water's water demand forecasting method has three parts:

1. Historical information is used to determine what factors influence water consumption. To do this, Sydney Water divided its customer base into 34 segments based on factors such as dwelling or business type, lot size and whether the property was built under the BASIX system.
2. An econometric model is estimated for each segment based on historical customer usage. The parameters of this model quantify the impact on demand of the factors that influence water consumption within each group, such as price elasticity, weather and seasonality.
3. Forecasting demand in the 2020 period by applying the forecast growth in customer numbers in each customer segment, climate projections, and estimates of system water losses and price elasticity, to the parameters estimated in the econometric model.

The model was tested using "hind casting" — forecasting demand over the 2016 period with historical inputs and comparing the output to actual water sales. The model was able to estimate historical demand over the 2016 period to within 1%.

Sydney Water's forecasts assumed long-term average rainfall

Rainfall can have a significant impact on water sales. Customer demand tends to be lower in wet years, or if water restrictions are in place.

Sydney Water's water sales forecast assumed long-run average rainfall (ie, no water restrictions) over the 2020 determination period. It considered this was a reasonable assumption, despite ongoing drought conditions at the time, because it was not possible to accurately predict climatic conditions over a four year period.

We agree that baseline water forecasts should assume average rainfall in the absence of more compelling estimates. However, we consider this approach creates unnecessary revenue uncertainty if water restrictions are implemented again in the 2020 determination period. Our dynamic pricing approach manages the risk of water restrictions without needing to predict rainfall patterns.

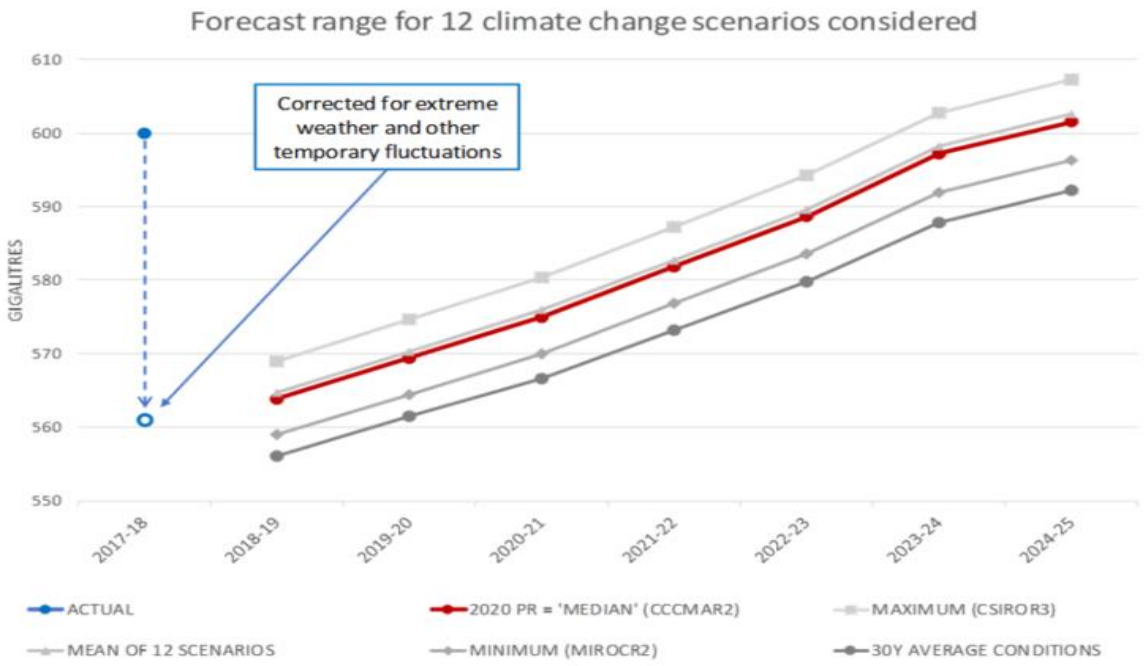
Sydney Water's forecasts included adjustments for climate change

Climate change has the potential to impact water demand through changes in rainfall patterns and higher temperatures. To address this, Sydney Water considered the impact of 12 climate change scenarios across four climate models for the period 2020-2040.[159] As shown in Figure J.1, the difference between the highest and lowest forecast was about 10 GL per year; mainly caused by forecasting uncertainty about future rainfall patterns.

[159] Sydney Water used modelling prepared as part of the NSW and ACT Regional Climate Modelling Project (NARCLiM). For more information see https://climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/About-NARCliM.

Sydney Water adjusted its water sales forecast based on the median of 12 forecasts. This is about 8 GL/year or 1.4% higher than its original forecast based on average rainfall patterns observed over the last 30 years.

Figure J.1 Range of forecasts produced for different climate change projections



Source: Sydney Water pricing proposal-Appendix 8A, July 2019, p 10.

Our consultants reviewed Sydney Water's forecasts

We consider Sydney Water's demand forecasting model is robust and performs well when validated using hind-casting. However, we asked our consultants Atkins/Cardno to review Sydney Water's proposed demand forecasts and comment on their underlying assumptions.

Atkins/Cardno had confidence in Sydney Water's residential demand modelling but acknowledged that there is underlying uncertainty in government growth forecasts for Sydney. It also noted Sydney Water was forecasting historically low per capita demand for both residential and non-residential customers. However they did not suggest any specific adjustments.

J.2 Estimating the impact of higher usage prices on demand

Water is generally quite "price inelastic", as customers do not change their behaviour very much in response to price changes.

Previous studies have provided a broad range of estimates for the price elasticity[160] for Sydney Water's customers from -0.11 to -0.35.[161,162] In its July 2019 price submission, Sydney Water provided us with updated estimates of its residential elasticities of -0.218 for houses and -0.063 for apartments. In our 2016 determination we used price elasticities of -0.249 for houses, -0.049 for apartments, and -0.264 for non-residential customers.[163]

We expect that water restrictions would tend to reduce the demand response to a change in price (as restrictions reduce discretionary demand). That is, water restrictions would lead to an inwards shift in the demand curve, as well as an increase in the 'slope' of the curve. To account for this effect, we have assumed that price elasticities would be reduced by half in a "drought" scenario. If anything, we consider this is likely to over-estimate the demand response in the short-run (which is affected by drought), given we do not have data on customer reactions to price changes during drought or customers' ability to react to large price increases in the short term.

Table J.2 Elasticities for a price increase in our demand forecast

	Proportion of water sales 2016-17 to 2018-19	Non-drought elasticity	Drought elasticity
Houses	51%	-0.218	-0.109
Apartments	23%	-0.063	-0.032
Non-residential	26%	-0.264	-0.132
Weighted average		**-0.194**	**-0.097**

Note: Water sales proportions exclude vacant land, mixed residential customers and unfiltered water customers.

160 Price elasticities are given as a ratio of how much less of a product customers will demand for a given price increase, so for example an elasticity of -0.1 means for each 1% the price increases, demand will decrease by 0.1%.

161 Warner, R. 1996. Water Pricing and the Marginal Cost of Water. Sydney Water Corporation.

162 Grafton, R.Q. and Kompas, T. (2007), 'Pricing Sydney Water', Australian Journal of Agricultural and Resource Economics, 51, 227–41.

163 IPART, *Review of prices for Sydney Water Corporation 1 July 2016 to 30 June 2020,* p143.

K Sydney Water's LRMC estimates

K.1 Estimates for water

IPART sets water usage charges with reference to the long-run marginal cost (LRMC) of supply. LRMC promotes efficient water usage and investment decisions by signalling the costs of supplying water to meet demand over the long-term. These long-term investments are predominantly the costs of bulk water supply augmentations. [164] It also provides a price signal to conserve water and encourage the development of substitutes such as recycled water.

In proposing to maintain a water usage price of $2.11/kL, Sydney Water estimated its LRMC of supplying water. Its updated estimate of the LRMC for water is $2.33/kL, with a sensitivity of between $0.72/kL and $3.08/kL.

Our analysis of Sydney Water's LRMC estimates suggests a range of between $2.00/kL to $2.30/kL would be appropriate.

We decided to set the water usage price towards the upper end of this range because:

- Sydney Water's customer engagement suggested that more customers supported higher water usage prices (and lower service charges), compared to lower water usage prices (and higher service charges).
- The LRMC has been estimated based on bottom-up costings, which might underestimate all the future costs of supplying water such as the need for additional treatment or transport infrastructure or the need to prioritise less cost favourable augmentations due to short-term supply factors.

164 Water treatment and transport assets make a relatively small contribution to LRMC.

Box 14.3 Sydney Water's LRMC estimates

In its pricing proposal, Sydney Water provided a range of LRMC estimates, and estimated the LRMC for bulk water costs, and transport and treatment costs. It used two modelling approaches – the Average Incremental Cost (AIC) and the Turvey methods – to estimate LRMC.

In reviewing its bulk water LRMC estimates, we found that:

- The incremental supply from its four bulk water augmentation options was less than the incremental demand it needed to serve over the next 50 years.
- Sydney Water estimates using the Turvey approach were not reliable, because the sequence of its augmentation options was not from low-cost to high-cost. This meant that a demand shock would result in Sydney Water effectively bringing forward the date of relatively cheap supply augmentations, potentially underestimating the LRMC.

We modified the Sydney Water model to reduce the time frame for the estimate to ensure demand met supply, and reordered the augmentations from low-cost to high-cost. After making these adjustments, and assuming a WACC of 4.0%,[a] we estimated an LRMC estimate of $2.00-$2.20/kL using the AIC approach (including the costs of transport and treatment).

Our modelling is broadly consistent with this result. With a 4.0% WACC, we estimated:

- a bulk water LRMC of around $1.80/kL, plus
- the LRMC of Sydney Water's treatment and transport costs of between $0.13/kL and $0.29/kL.

The LRMC estimates are sensitive to the discount rate chosen because supply augmentations are built before the demand they serve is realised. When the interest rate is higher, the future demand served by an asset is discounted by more, which leads to a higher LRMC estimate.

Taken together, our analysis suggests an LRMC of up to $2.30/kL would be appropriate.

b This is set equal to the current pre-tax real WACC, used throughout this draft report.

K.2 Estimates for wastewater

We prepared catchment-level wastewater LRMC estimates for Sydney Water using an Average Incremental Cost (AIC) method, calculated as:

$$LRMC = \frac{NPV(Annualised\ capital\ expenditure + Incremental\ operating\ expenditure)}{NPV(Incremental\ Demand)}$$

In addition:

- We assumed a discount rate of 4.0%, consistent with the pre-tax real WACC used throughout the Draft Report.
- Capital expenditure is estimated from Sydney Water planning documents at the 1-5 year, 5-15 year, 15-25 year and >25 year planning horizons. Capital expenditure was assumed to be spread evenly over each five or ten year period.
- We applied an 18% reduction to Sydney Water's capital costs. This is consistent with the average 18% efficiency challenge applied by Sydney Water across all its proposed capital expenditure.

- We estimated the incremental operating expenditure, by estimating the operational costs of wastewater treatment and transport.
- Unit treatment costs for each catchment are based on Sydney Water estimates and vary from $108/ML to $6,652/ML. These are based on the average costs of treatment, which could over-estimate the costs for smaller catchments.
- A common unit transport cost of $0.34/kL was used across all catchments based on Sydney Water's SIR.
- Incremental demand was based on the forecast growth in average dry weather flows in Sydney Water's planning documents.

Our estimates are presented in Table K.1 below.

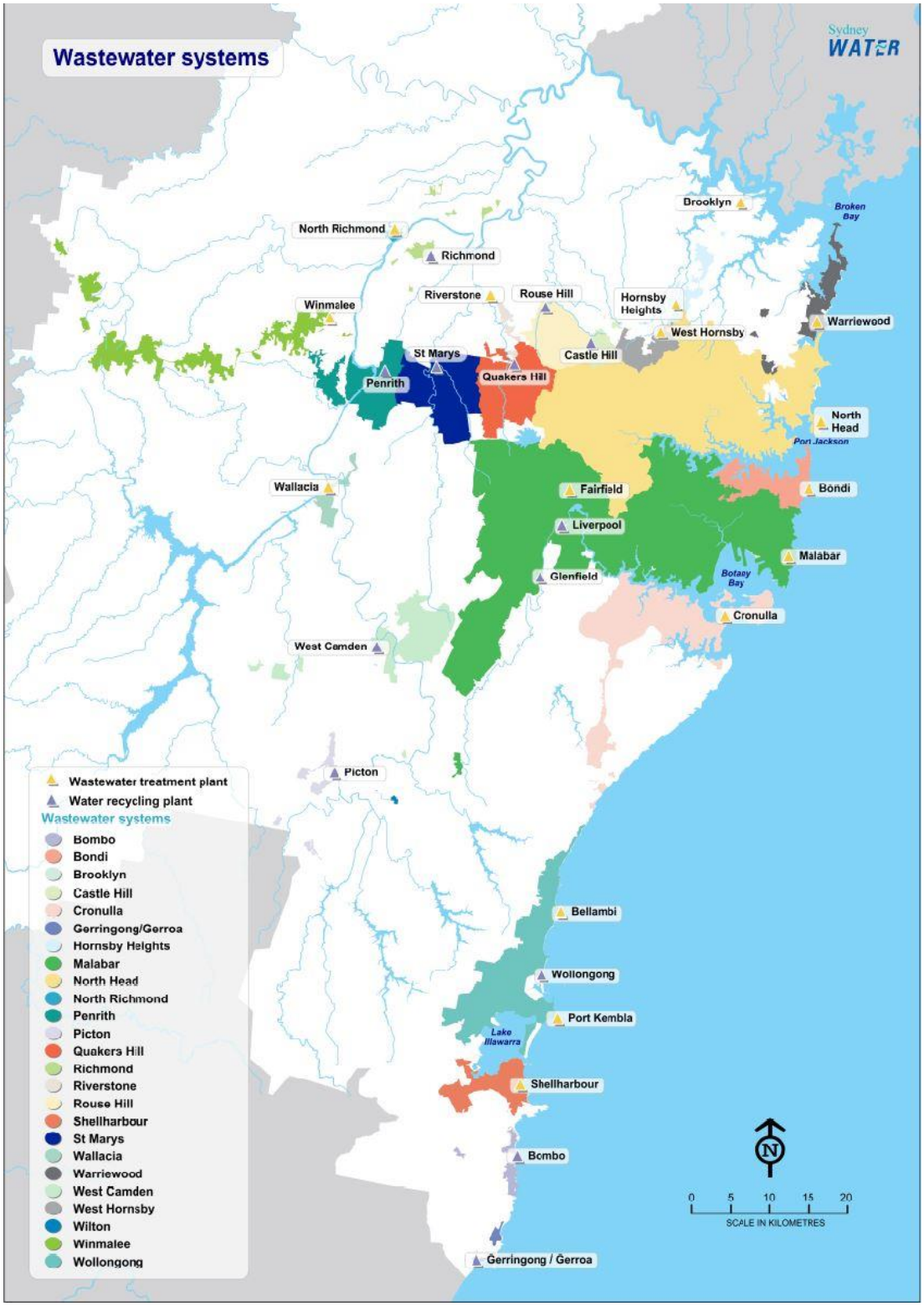
Table K.1 Estimated wastewater LRMC for some Sydney Water catchments ($2020-21)

	Treatment process	Dry weather flow in 2018 GL/yr	LRMC $/kL	Short-run operating costs $/kL
Bombo	Secondary (with recycling)	1.4	15.98	0.77
Bondi	**Primary (deep ocean outfall)**	44.5	1.43	0.60
Brooklyn	Tertiary	0.1	15.61	6.83
Castle Hill	Tertiary (with recycling)	2.5	3.78	0.87
Cronulla	Tertiary	19.0	0.80	0.63
Malabar	**Primary[a] (deep ocean outfall)**	170.0	2.78	0.44
North Head	**Primary (deep ocean outfall)**	119.7	3.51	0.49
Penrith	Tertiary (with recycling)	10.1	2.95	0.97
Picton	Tertiary (with recycling)	1.3	11.64	1.10
Quakers Hill	Tertiary (with recycling)	13.8	1.79	0.77
Riverstone	Tertiary	4.8	9.70	2.35
Rouse Hill	Tertiary (with recycling)	10.3	6.52	1.04
Shellharbour	Secondary	6.7	4.18	0.85
St Marys	Tertiary (with recycling)	14.7	2.32	0.86
Wallacia	Tertiary	0.3	11.67	1.76
West Camden	Tertiary (with recycling)	7.9	9.04	1.09
West Hornsby	Tertiary	4.7	3.39	0.92
Wollongong	Tertiary (with recycling)	18.1	10.47	0.71
Weighted average			**3.40**	**0.59**

a Some wastewater in the Malabar system receives secondary or tertiary treatment at the Glenfield or Liverpool wastewater recycling plants for local recycling purposes or to minimise system degradation if the wastewater is transported to Malabar for ocean discharge.

Source: IPART analysis of Sydney Water data.

Figure K.1 Map of Sydney Water's wastewater catchments



Data source: Sydney Water website.

L Multi Premises, Joint Service Arrangements, and Dual Occupancies

Service charges for water, wastewater, and stormwater (where relevant) are set based on whether a property is non-residential or residential, and individually metered or on a common meter.

- Residential properties are charged a standard 20mm residential service charge.
- Non-residential properties are charged a service charge based on their meter size.
- Non-residential properties in a non-residential multi premises that share a common meter pay a share of the meter-based charge.

However, sometimes it is not easy to apply a meter-based charge for non-residential properties that share a meter. This affects **mixed multi premises** and non-residential properties in a **joint service arrangement**.

Mixed multi premises properties have a mixture of residential and non-residential properties that share a common meter. Currently, all properties within these premises pay residential charges, because it is not feasible to determine what share of the meter-based charge any non-residential properties should pay. We decided to continue with this approach.

A **joint service arrangement** occurs where there is a 'parent' premises with a connection to the network, as well at least one 'child' premises that has a pipe connected to the 'parent' property's connection. The parent and/or child premises could have a single property, or be a multi premises, and contain a mixture of residential and non-residential properties.

In these cases, we charge a non-residential property a meter-based charge where it is feasible to do so, but charge a non-residential property a residential charge where it is not. We have decided to continue with this approach, with one small change to ensure that where there are only non-residential properties in a joint service arrangement, all properties pay a share of a meter-based charge.

After consulting with Sydney Water, we have decided to change pricing in situations where a single non-residential parent property has only single non-residential child properties or non-residential multi premises downstream so that both the parent and all child properties are charged on a common meter basis.

The changes are bolded in the table below.

Table L.1 Each joint service arrangement permutation

First property/ premises (parent)	Charge type	Subsequent property(s) or premises (child)	Charge type
Single residential property	Residential base charge	Single residential property	Residential base charge
	Residential base charge	Single non-residential property	Residential base charge
	Residential base charge	Residential Multi Premises	Residential base charge per premise
	Residential base charge	Non-residential Multi Premises	Residential base charge per premise
Single non-residential property	Meter size	Single residential property	Residential base charge
	Meter size	Single non-residential property	**Meter size/total premises**
	Meter size	Residential Multi Premises	Residential base charge per premise
	Meter size	Non-residential Multi Premises	**Meter size/total premises**
Residential Multi Premises	Residential base charge per premise	Single residential property	Residential base charge
	Residential base charge per premise	Single non-residential property	Residential base charge
	Residential base charge per premise	Residential Multi Premises	Residential base charge per premise
	Residential base charge per premise	Non-residential Multi Premises	Residential base charge per premise
Non-residential Multi Premises	Meter size / premises	Single residential property	Residential base charge
	Meter size / premises	Single non-residential property	Residential base charge
	Meter size / premises	Residential Multi Premises	Residential base charge per premise
	Meter size / total premises	Non-residential Multi Premises	Meter size / total premises

Source: Sydney Water, internal document from 2016 price review.

M Trade waste prices

Our draft decision is to set the maximum trade waste prices for 2020-21 as presented in the following tables.

Table M.1 Industrial agreement, commercial agreement, and Wastesafe charges $ p.a. ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Industrial agreements					
Risk Index 1	$9,116.07	$10,486.39	$10,601.74	$10,718.36	$10,836.26
Risk Index 2	$9,116.07	$10,486.39	$10,601.74	$10,718.36	$10,836.26
Risk Index 3	$9,116.07	$10,486.39	$10,601.74	$10,718.36	$10,836.26
Risk Index 4	$4,207.82	$4,839.87	$4,893.11	$4,946.93	$5,001.35
Risk Index 5	$2,806.83	$3,226.58	$3,262.07	$3,297.96	$3,334.23
Risk Index 6	$1,403.41	$1,613.29	$1,631.04	$1,648.98	$1,667.12
Risk Index 7	$701.71	$806.65	$815.52	$824.49	$833.56
Commercial agreements					
First process	$164.65	$104.88	$106.04	$107.21	$108.38
Each additional process	$56.51	$34.96	$35.34	$35.73	$36.12
Wastesafe charges					
Administration charge	$117.11	$39.55	$39.98	$40.42	$40.87
Missed service charge (<2000kL trap)[a]	$322.70	N/A	N/A	N/A	N/A
Missed service charge (>2000kL trap)[a]	$645.42	N/A	N/A	N/A	N/A

[a] Sydney Water proposes to eliminate missed service charges as part of its new approach to managing non-compliant Wastesafe customers.

Source: Sydney Water trade waste agreement model, IPART analysis.

Table M.2 Trade waste ancillary charges ($2019-20)

		2019-20	2020-21	2021-22	2022-23	2023-24
Additional inspection	$/each	$219.44	$216.57	$218.96	$221.36	$223.80
Industrial trade waste application – standard	$/each	$529.72	$785.08	$793.72	$802.45	$811.27
Industrial trade waste application – non-standard	$/hr	$162.27	$108.29	$109.48	$110.68	$111.90
Industrial trade waste application - variation	$/each	$636.88	$442.17	$447.04	$451.95	$456.92
Sale of trade waste data[a]	$/hr	$158.14	N/A	N/A	N/A	N/A

[a] Sydney Water proposes to eliminate this charge.

Source: Sydney Water trade waste agreement model.

Table M.3 Commercial pollutant charges, $/kL ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Low strength BOD food	2.452	1.682	1.701	1.719	1.738
Higher strength BOD food	4.029	2.331	2.357	2.383	2.409
Automotive	0.8	0.479	0.485	0.490	0.495
Laundry	0.5	0.394	0.398	0.403	0.407
Lithographic	0.385	0.276	0.279	0.282	0.285
Photographic	Nil	Nil	Nil	Nil	Nil
Equipment hire wash	3.653	2.774	2.805	2.836	2.867
Ship to shore	Nil	Nil	Nil	Nil	Nil
Miscellaneous	Nil	Nil	Nil	Nil	Nil
Other (default)	Nil	Nil	Nil	Nil	Nil
Charge for low and high strength BOD food if pre-treatment is not maintained in accordance with requirements	12.581	13.006	13.149	13.294	13.440

Source: Sydney Water trade waste pollutant model, IPART analysis.

Table M.4 Industrial pollutant charges, $/kg above domestic equivalent ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Primary STPs					
BOD – treatment charge[a]	0.318	0.319	0.323	0.326	0.330
BOD – corrosion charge[a]	0.137	0.139	0.140	0.142	0.143
Suspended Solids	0.577	0.450	0.455	0.460	0.465
Grease	0.521	0.408	0.412	0.417	0.421
Secondary and Tertiary STPs					
BOD – treatment charge[a]	2.066	1.574	1.591	1.609	1.627
BOD – corrosion charge[a]	0.137	0.139	0.140	0.142	0.143
Suspended Solids	1.672	1.027	1.038	1.050	1.061
Grease	1.597	1.063	1.074	1.086	1.098
Nitrogen	1.894	1.177	1.190	1.203	1.217
Phosphorous	6.792	1.359	1.374	1.389	1.405

[a] The total BOD price is calculated using the formula $a + \left(b \times \frac{c}{600}\right)$ where *a* is the BOD treatment charge, *b* is the BOD corrosion charge and *c* the concentration of BOD in the customers discharge measured in mg/L.

Note: The trade waste charges which apply reflect which STP a trade waste customer discharges into.

Source: Sydney Water trade waste pollutant model, IPART analysis.

Corrosive substance charges

Temperature and acidity (pH) charges were introduced in the year 2012. These charges can only be applied to customers within a corrosion declared catchment. To date these charges have not been used as customers have been successfully managed using Effluent Improvement Programs (EIP's).

Table M.5 Corrosive substance charges, $/ML ($2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Acidity (pH)[a]	71.956	72.748	73.548	74.357	75.175
Temperature[b]	7.966	8.054	8.142	8.232	8.322

[a] The charge is applied for each unit of pH less than pH7 eg if the pH is pH5 then the charge will be multiplied by two.

[b] The charge is applied for each degree by which the temperature per ML of wastewater is greater than 25 degrees

Source: Sydney Water trade waste pollutant model, IPART analysis

Revenue forecasts

Trade waste revenue will fall by approximately 25% in the 2020 Determination as a result of lower prices.

Table M.6 Trade waste and Wastesafe revenue (million, $2019-20)

	2019-20	2020-21	2021-22	2022-23	2023-24
Industrial pollutant	11.8	9.8	9.9	10.0	10.2
Commercial pollutant	15.2	10.9	11.0	11.1	11.2
Industrial agreement	1.3	1.4	1.5	1.4	1.5
Commercial agreement	3.1	2.0	2.0	2.1	2.1
Trade waste ancillary	0.03	0.03	0.03	0.03	0.03
Wastesafe	1.6	0.5	0.6	0.6	0.6
Total	**33.0**	**24.7**	**25.0**	**25.3**	**25.6**

Source: Sydney Water pricing proposal, 1 July 2019

Box M.1 Trade waste pollutant charges explained

Sydney Water's trade waste pollutant prices are set to recover the additional operating costs of transporting and treating the five pollutants discussed below. The prices for commercial and industrial customers are set to recover the relative contributions these two groups make to Sydney Water's costs. These costs are estimated as a fraction of the total costs required to manage all wastewater discharge, rather than as the marginal impact of trade waste.

Pollutant charges for Industrial Customers are set on a load[a] basis – they are based on the mass of a particular pollutant a customer is deemed to discharge into the sewer system. This requires Sydney Water to inspect and sample the discharge from individual customers, to reflect the diverse scale and nature of Industrial customers and allow for cost reflective pricing.

Commercial Customers' pollutant charges are set on a volume basis – customers are charged a flat rate for each kilolitre of wastewater discharged — similar to sewerage usage charges. The rate applied varies depending on the nature of the customers' business (for example, food businesses pay a higher rate than laundromats). These rates are based on the relative contribution of each business type to the total pollutant load. This approach is administratively simple and reflects the more homogeneous discharges of different types of commercial customers.

Pollutants which Sydney Water charges for:

Sydney Water sets pollutant charges based on five pollutants: BOD, Oil and Grease, Suspended Solids, Nitrogen and Phosphorus. It also has the ability to charge for high-temperature or acidic discharges under certain circumstances, however it does not currently levy any customers these charges. It manages other pollutants, such as heavy metals and industrial chemicals which are not present in domestic sewerage, through acceptance standards which limit the concentration[c] of these materials in the waste stream.

Biochemical Oxygen Demand (BOD)	BOD is a technique for measuring the amount of organic material in water which can serve as a fuel source for bacteria.[b]

	Excessive BOD affects Sydney Water's costs in two ways: through its effects on treatment plant loads and by promoting corrosion in transport networks. This is reflected in the industrial pollutant pricing formula: $$BOD\ (\$/kg) = P_t + P_c \times \frac{[BOD]}{L_{BOD}}$$ P_t reflects the additional costs Sydney Water faces for removing excess organic material in its wastewater treatment plants, this is charged at a flat rate per kg of pollutant load, regardless of the concentration of pollutant in the discharge. P_c reflects that as organic material breaks down it makes water more acidic which accelerates corrosion and also produces toxic (and foul smelling) hydrogen sulphide. To address this Sydney Water doses in chemicals prior to waste reaching a treatment plant. Corrosion management costs are dependent on the concentration of BOD entering the sewer system. To reflect this, the pricing formula includes an adjustment factor where [BOD] is the BOD concentration in a customer's discharge and L_{BOD} is a reference concentration of 600mg/l. So customers with lower strength discharge pay lower corrosion charges.
Grease	Oil and grease from cooking and industrial processes can block sewers and treatment plants and create slicks in rivers and oceans. It floats to the top of settled wastewater and is removed using a skimmer. Pollutant charges are set on a pure load basis.
Suspended Solids	Includes fine inert material such as dirt suspended in the water column which causes cloudiness and provides a breeding ground for bacteria and viruses. This material is settled out using flocculating agents such as Iron Chloride. Pollutant charges are set on a pure load basis.
Nitrogen and Phosphorous	Nitrogen and Phosphorous releases into the environment from wastewater treatment have been a major cause of algal blooms in rivers. Sydney Water needs to manage these pollutants in inland catchments only, given ocean outfalls can better disperse flows. Excess Nitrogen is normally managed through biological processes, while Phosphorous is managed chemically. Pollutant charges are set on a pure load basis in catchments with secondary and tertiary treatment plants.

a "Load" is the total mass in kg of a pollutant discharged by a customer over a particular period of time, normally a trade waste billing cycle. It is not measured directly, but instead estimated from sampling. Pollutant charges are generally set on a load basis, because treatment plants are already designed to manage these pollutants in domestic sewerage, and therefore contribute to the average rather than marginal operating costs. Load should not be confused with concentration, see below.

b BOD measures the amount of material indirectly by observing the amount of oxygen converted into carbon dioxide by bacteria in a water sample over time.

c Concentration is the mass of a pollutant in a given volume of water (measured in mg/l), at a particular point in time. Acceptance standards are set on a concentration basis because although treatment plants are able to manage the *load* of a pollutant over time, the system may not be able to manage a large amount of the material at any one time.

N Miscellaneous and ancillary charges

N.1.1 Sydney Water's miscellaneous and ancillary charges

Table N.1 sets out our draft proposed miscellaneous and ancillary charges for Sydney Water. The charges are subject to an annual 1.1% corporate cost increase.

Table N.N.1 Draft miscellaneous and ancillary charges ($2019-20)

Service no.	Function	2020-21	2021-22	2022-23	2023-24
1	Conveyancing Certificate Electronic	7.01	7.09	7.17	7.24
2	Property Sewerage Diagram				
	(a) Over the counter	N/A	N/A	N/A	N/A
	(b) Electronic	13.38	13.53	13.68	13.83
	(c) Online (Tap In)	24.03	24.29	24.56	24.83
3	Service Location Diagram				
	(a) Over the counter	N/A	N/A	N/A	N/A
	(b) Electronic	7.63	7.71	7.80	7.88
	(c) Online (Tap In)	16.19	16.37	16.55	16.73
4	Special Meter Reading Statement	36.47	36.87	37.28	37.69
5	Billing Record Search Statement - up to and including 5 years	33.79	34.16	34.54	34.92
6	Building over/Adjacent to Asset Advice	46.01	46.52	47.03	47.55
7	Water Reconnection	55.30	55.91	56.52	57.15
8	Workshop Test of Water Meter				
	(a) 20, 25 and 32 mm meters	177.11	179.06	181.03	183.02
	(b) 40 and 50 mm light meters	218.87	221.28	223.71	226.17
	(c) 50 mm heavy, 80, 100 and 150 mm meters	244.04	246.72	249.44	252.18
	(d) 200, 250 and 300 mm meters	407.08	411.56	416.09	420.66
9	Water Service Disconnection	Nil	Nil	Nil	Nil
10	Water Service Connection Installation Application	Nil	Nil	Nil	Nil
11	Water Service Connection Approval Application (32-65 mm)	326.99	330.59	334.22	337.90
12	Water Service Connection Approval Application (80 mm or greater)	326.99	330.59	334.22	337.90
13	Application to assess a Water Main Adjustment	N/A	N/A	N/A	N/A
14	Standpipe Hire – Security Bond	N/A	N/A	N/A	N/A
15	Standpipe Hire – Annual Fee	N/A	N/A	N/A	N/A
16	Standpipe Water Usage Fee	N/A	N/A	N/A	N/A
17	Backflow Prevention Device Application and Registration Fee	N/A	N/A	N/A	N/A
18	Backflow Prevention Device Annual Administration Fee	N/A	N/A	N/A	N/A
19	Major Works Inspection Fee	N/A	N/A	N/A	N/A
20	Statement of Available Pressure and Flow	135.45	136.94	138.45	139.97
21	Request for Asset Construction Details	50.43	50.98	51.55	52.11
22	Supply System Diagram	145.26	146.86	148.47	150.11
23	Building Plan Approval Application	17.25	17.44	17.63	17.83
24	Asset Adjustment Application	266.42	269.35	272.31	275.31
25	Water Main Fitting Adjustment Application	Nil	Nil	Nil	Nil
26	Water Pump Application	135.45	136.94	138.45	139.97

Service no.	Function	2020-21	2021-22	2022-23	2023-24
27	Extended Private Service Application	Nil	Nil	Nil	Nil
28	Wastewater Connection Installation Application	Nil	Nil	Nil	Nil
29	Wastewater Ventshaft Relocation Application	Nil	Nil	Nil	Nil
30	Disuse of Wastewater Pipe or Structure	Nil	Nil	Nil	Nil
31	Stormwater Connection Approval Application	Nil	Nil	Nil	Nil
32	Application for inspection of Stormwater Connection	Nil	Nil	Nil	Nil
33	Development Requirements Application				
	(a) Development requirements – complying development	195.42	197.57	199.74	201.94
	(b) Development requirements - other	516.79	522.47	528.22	534.03
34	Road Closure Application	Nil	Nil	Nil	Nil
35	Water and Sewer Extension Application	516.79	522.47	528.22	534.03
36	Monthly Meter Reading request by Customer	11.76	11.89	12.02	12.15
37	Replacement of Meter Damaged by Customer/Customer's Agent				
	(a) 20mm	193.15	195.27	197.42	199.59
	(b) 25, 32 and 40 mm	267.40	270.34	273.32	276.32
38	Integrated Service Connection Application	257.99	260.83	263.70	266.60
39	Sydney Water Hourly Rate	147.23	148.85	150.49	152.14
40	Remote read meter (one off fee)				
	(a) 20mm	214.56	216.92	219.31	221.72
	(b) 25mm	226.07	228.56	231.07	233.61
	(c) 32mm, 40mm, 50mm light	248.11	250.84	253.60	256.39
	(d) 50mm heavy, 80mm, 100mm	435.26	440.05	444.89	449.78
41	Inaccessible meter fee (quarterly charge)	9.78	9.89	10.00	10.11
42	Backflow Annual Test (new)	228.76	231.28	233.82	236.39

*N/A means that Sydney Water either does not provide the relevant service, or the service has been combined with other services and recovered by one charge.
#Nil means service provided that has no charge.

O Service charge cost pass-throughs

In this appendix we discuss the three cost pass-throughs, to Sydney Water's water service charge, that we have included in our 2020 draft determination. These pass-throughs allow Sydney Water to recover its efficient costs for bulk water costs which are uncertain, they are calculated and applied on an annual basis to reflect costs in the previous year.[165]

The water service price that applies in each year of the determination period is calculated as the sum of the base water service charge, plus each of the three cost pass throughs, as shown in the formula below.

$$MSC_{WSS} = BSC + SDP + WNSW + CCP$$

Where:

- MSC_{WSS} is the total water supply service charge applicable for a customer's Meter.
- BSC means the base service charge for the Meter. This is the water service charge presented in Chapter 6 of the report.
- SDP is the SDP Adjustment to manage differences in Sydney Water's forecast and actual payments to SDP.
- $WNSW$ is the WNSW Adjustment to account for pumping costs associated with Shoalhaven transfers, and
- CCP is a contingent cost pass-through, for the capital costs Sydney Water faces from an expansion of the capacity of SDP.

We discuss each of the three cost pass-throughs in turn in this appendix. Note that the dollar figures presented in this appendix are in $2020-21, the dollar basis for the pass-throughs in the Determination.

O.1 Service charge cost pass-through for SDP

We have decided to maintain our service charge cost pass-through for Sydney Desalination Plant (SDP) costs. The service charge pass-through mechanism will capture:

- differences in SDP's actual service charges (fixed costs) to Sydney Water, compared to our forecasts
- any forecast error in our estimate of the water usage charge adjustment, and
- any additional charges from SDP if the NSW Government decides to expand SDP during the 2020 determination period.

We have updated this formula from our 2016 determination to account for our new dynamic pricing approach.

165 The formulas and descriptions in this appendix are presented differently to those in the draft Sydney Water Determination to aid readability. Where discrepancies exist, the formulas and descriptions in the determination supersede those here.

The SDP cost pass-through formula adjusts the water service price, in the following year, for the difference between SDP's actual charges to Sydney Water, compared to the forecast revenue that we have already included in customer prices.

Broadly, the formula is calculated using the following information:

1. The **Actual Costs** that Sydney Water pays to SDP over a period. These costs are determined on a *nominal* cost basis. As discussed further below, we have decided that these costs would be lagged by 15 months between when they are incurred, and when the cost pass-through formula adjusts customers' prices.
2. The **Expected Revenue** that Sydney Water was initially allowed through water service and usage prices. This revenue is calculated on a *real* $2020-21 basis. We have allowed Sydney Water the following revenue:
   - The base revenue we assume Sydney Water would pay to SDP when it is not operational in non-drought periods.
   - The additional revenue, recovered from customers through a higher water usage price in drought, to cover the assumed costs of operating SDP.
3. The **Avoided Costs** (of water treatment) that Sydney Water would actually save depending on the volume of water actually supplied by SDP during the period. These avoided costs are also calculated on a *real* $2020-21 basis.

Because the costs and revenues are calculated using different price bases, the formula first converts all costs to $2020-21.

The actual costs, less the revenues and avoided costs, is the net amount to be recovered (or returned) from all water customers through the pass-through adjustment.

The formula then makes three additional adjustments.

1. It adjusts for the holding period between when the 'net cost' was incurred, and when this net amount is recovered through the water service charge. We have decided that the pass-through formula would calculate the costs and revenues, for the period of 1 April to 31 March of the year preceding the cost pass-through. Therefore, the holding period is 5 quarters, and we have applied a real pre-tax WACC of 5.0% in making this adjustment.[166]
2. It then "re-inflates" these costs to the determination year of the pass-through formula, using a second CPI adjustment.
3. It then calculates the adjustment to each customers' water service charge, depending on the size of their meter. The SDP adjustment is firstly divided by the forecast number of "20mm equivalent" customers, and then scaled up based on the size of a customer's actual meter.

Note that we have decided to not apply an SDP service charge cost pass-through in 2020-21, because we would include the pass-through amount for the first year of the determination into the base service charge.

166 This is the rounded value of the 4.0% real pre-tax WACC, compounded for 5 quarters.

The SDP service charge cost pass-through formula for the remainder of the 2020 determination period is:

$$SDP_t = \left\{ \underbrace{\left[\frac{C_{t-1}}{CPI^*_{t-2}}\right]}_{\text{Actual costs in \$2020-21}} - \underbrace{[B_{t-1} + (WUC_{t-1} \times w_{t-1})]}_{\text{Expected revenue in \$2020-21}} - \underbrace{[V_{t-1} \times A_{t-1}]}_{\text{Actual avoided treatment costs in \$2020-21}} \right\} \times \underbrace{WACC}_{\text{Holding cost}} \times \underbrace{CPI_{t-1}}_{\text{Converts \$2020-21 into nominal costs}} \times \underbrace{\left(\frac{1}{M_t}\right)}_{\text{Divides by total customer numbers}} \times \underbrace{\left(\frac{Z^2}{400}\right)}_{\text{Calculates the per property charge}}$$

Where:

SDP_t is the SDP Adjustment to the base water supply service charge for a Meter in a Period;

C_{t-1} is the charges paid by Sydney Water to SDP under the SDP Determination between 1 April in the year before and 31 March of that year;

B_{t-1} represents the base SDP costs (in $2020-21) included in the revenue requirement for Sydney Water.

1. $180,158,304, when calculating SDP_t for 2021-22;
2. $178,505,971, when calculating SDP_t for 2022-23; and
3. $178,085,959, when calculating SDP_t for 2023-24;

WUC_{t-1} is the applicable water usage charge per megalitre in the 2017 SDP determination, in $2020-21,[167] set as:

1. $681.16, when calculating SDP_t for 2021-22;
2. $669.17, when calculating SDP_t for 2022-23; and
3. $669.17, when calculating SDP_t for 2023-24;

W_{t-1} is the assumed volume of water supplied by SDP (ie, 250 megalitres per day), for each quarter that the drought water usage price applies between 1 April in the year before and 31 March of that year;

V_{t-1} is the volume of filtered water (in megalitres) actually supplied by SDP to Sydney Water in the immediately preceding Pass-Through Charging Period;

A_{t-1} is the avoided water filtration costs per megalitre of water supplied to Sydney Water by SDP (in $2020-21), set as:

1. $43.70, when calculating SDP_t for 2021-22;
2. $43.75, when calculating SDP_t for 2022-23; and
3. $43.81, when calculating SDP_t for 2023-24;

The values of CPI_{t-1} and CPI^*_{t-2} are outlined in Table O.1 below.

WACC is the real pre-tax weighted average cost of capital applicable to Sydney Water. We have determined this to be 1.05 for this determination.

167 IPART SDP determination schedule 1 cl 3.

M_t is IPART's forecast number of 20mm equivalent water customers, set as:

1. 2,211,153, when calculating SDP_t for 2021-22;
2. 2,250,064, when calculating SDP_t for 2022-23; and
3. 2,287,272, when calculating SDP_t for 2023-24;

Z means the actual or deemed size of a customer's water meter (in millimetres).

O.2 Service charge pass-through for Shoalhaven transfer costs

We are maintaining the service charge cost pass-through mechanism to compensate Sydney Water for actual bulk water costs incurred from WaterNSW for transfers from Shoalhaven. Shoalhaven transfers represent uncertain bulk water operating costs to Sydney Water in terms of volume and price risk. Under the 2017 Metropolitan Water Plan, WaterNSW starts pumping from the Shoalhaven River system when Sydney's dam levels fall to 75% and continue until they rise above 80%.[168]

Under this cost pass-through mechanism the difference between Sydney Water's forecast bulk water costs from WaterNSW and its actual bulk water costs from WaterNSW will be passed through to Sydney Water's customers at a year's lag via the water service charge.

We have also updated this formula from our 2016 determination to account for our new dynamic pricing approach.

As with the SDP pass-through, we have decided that the pass-through formula would calculate the costs and revenues, for the period of 1 April to 31 March of the year preceding the cost pass-through.

We have decided to not apply a service charge cost pass-through for Shoalhaven transfer costs in 2020-21, because we would include the pass-through amount for the first year of the determination into the base service charge.

The formula for the 2020 determination period is:

$$\mathrm{WNSW_t} = \left(\frac{\mathrm{C_{t-1}}}{\mathrm{CPI^{*}_{t-2}}} - \mathrm{R_{t-1}} \right) \times \mathrm{WACC} \times \mathrm{CPI_{t-1}} \times \frac{1}{\mathrm{M_t}} \times \frac{\mathrm{Z}^2}{400}$$

Where:

$WNSW_t$ is the WNSW Adjustment to the base water supply service charge for a Meter in a Period;

C_{t-1} is the charges paid by Sydney Water to Water NSW for the Shoalhaven Transfer between 1 April in the year before and 31 March of that year;

R_{t-1} is the revenue from Shoalhaven transfers we have allowed Sydney Water to recover from the water usage price (in $2020-21). It is:

168 NSW Government, *2017 Metropolitan Water Plan*, March 2017 p 28.

- $3,587,500 in all quarters where the drought water usage price applies, and
- $0 otherwise;

The values of CPI_{t-1} and CPI^{*}_{t-2} are outlined in Table O.1 below.

WACC is the real pre-tax weighted average cost of capital applicable to Sydney Water. We have determined this to be 1.05 for this determination.

M_t is the forecast number of 20mm equivalent water customers, set as:

1. 2,211,153, when calculating $WNSW_t$ for 2021-22;
2. 2,250,064, when calculating $WNSW_t$ for 2022-23; and
3. 2,287,272, when calculating $WNSW_t$ for 2023-24.

Z means the actual or deemed size of the meter (in millimetres).

O.3 Service charge cost pass-through for Sydney Water's contingent capital expenditure related to expanding the SDP

If the NSW Government decides to expand SDP during the 2020 determination period, our draft decision is that Sydney Water's costs of expanding its network to accommodate additional flows from SDP would be recovered through an annual cost pass-through to the water service charge. In future determination periods these assets would be rolled into Sydney Water's water RAB.

The trigger for this pass-through is IPART receiving a "Construction Commencement Notification" which will reflect a government decision to expand the capacity of SDP.

$$CCP_t = CCA \times CPI_{t-1} \times \frac{Z^2}{400}$$

Where:

CCP_t is the contingent capital cost adjustment to the base water supply service charge for a Meter;

CCA means the contingent cost amount, which is:

1. $0 in a year where there has not been a Construction Commencement Notification received;
2. $0 in a year where a Construction Commencement Notification is received;
3. $6.83 (in $2020-21) in any year following the year a Construction Commencement Notification is received, over the 2020 determination period.

The values of CPI_{t-1} are outlined in Table O.1 below.

Z means the actual or deemed size of the meter (in millimetres).

O.4 Consumer cost index in this appendix

We use the consumer price index (CPI) to inflate prices over time. The 'base' CPI value used to set prices for $2020-21 is the March quarter 2020 CPI value. The Table below presents the CPI values we use to convert nominal prices into $2020-21, and to convert real $2020-21 values into nominal values in later years of the determination.

Table O.1 Values of CPI that apply to the cost pass-through formulae

Year of cost pass-through	CPI_{t-1} Applies to all three pass-throughs	CPI^{*}_{t-2} Only applies to SDP and Shoalhaven pass-throughs
2021-22	$\frac{CPI_{March2021}}{CPI_{March2020}}$	$\frac{CPI_{December2019}}{CPI_{March2020}}$
2022-23	$\frac{CPI_{March2022}}{CPI_{March2020}}$	$\frac{CPI_{December2020}}{CPI_{March2020}}$
2023-24	$\frac{CPI_{March2023}}{CPI_{March2020}}$	$\frac{CPI_{December2021}}{CPI_{March2020}}$

P Discretionary expenditure framework

P.1 What is discretionary expenditure

We set utilities' prices to recover the efficient costs of supplying monopoly services to customers. The prices recover the efficient operating and capital expenditure required for utilities to meet service standards to customers (eg, as specified in the operating licence), and to comply with other regulatory obligations (eg, as specified in Environment Protection Licences, administered by the EPA).

Discretionary expenditure could include:

- Expenditure that is not required to deliver the utility's monopoly services.
- Expenditure to provide services or achieve outcomes that are not mandated.
- Expenditure to provide a level of service that goes beyond service standards stipulated in the utility's operating licence or other regulatory requirements.

In 2016, we noted that we would consider, and could allow, discretionary expenditure to be recovered via regulated prices, but that we would require clear evidence that it would be efficient for customers to pay to exceed mandated standards. For instance, we would consider whether:

- The proposal would best fit with the utility's responsibilities or whether it would best fit with another party's responsibilities.
- The utility's customers have the capacity and willingness to pay for the discretionary expenditure (based on information or evidence provided by the utility).[169]

Our recent decisions on recycled water pricing also recognised the importance of customer willingness to pay.[170] We allow for the costs of recycled water schemes to be recovered from general water and/or wastewater prices to the extent there is sufficient evidence that the broader customer base is willing to pay for the external benefits of the recycled water scheme.[171] We have set out a number of best practice principles for demonstrating willingness to pay, and for consulting customers around discretionary expenditure.[172]

As outlined in our Guidelines for Water Agency Pricing Submissions, utilities should have a strong and up to date understanding of customer preferences.[173] Further, it is the utility's responsibility to engage with its customers to understand their views, priorities and needs and that the information gathered through this engagement should inform a utility's decision-making and pricing submission.

169 IPART, Review of prices for Sydney Water Corporation, Final Report, June 2016, p 37.
170 IPART, Review of pricing arrangements for recycled water and related services, July 2019.
171 To qualify for funding from the broader customer base, external benefits must be additional to any outcomes already mandated by Government, specific to the recycled water scheme(s) in question, and supported by customer willingness to pay for them. IPART, Review of pricing arrangements for recycled water and related services, July 2019, p 2.
172 IPART, Review of pricing arrangements for recycled water and related services, July 2019, p 61.
173 Guidelines for Water Agency Pricing Submissions, IPART, April 2018, pp. 20-21.

Utilities should engage with their customers on existing business and standards and where a utility proposes to make changes to prices or services which would affect specific customer groups. Utilities should also engage with customers if they include any discretionary expenditure in their pricing proposal.

However, significant or material changes to a utility's service standards, environmental obligations or other regulatory outcomes should be addressed by consulting customers and the entity which enforces the regulation, with the aim of updating standards or regulations to reflect changing community preferences. As a second best option, where the cost to achieve a discretionary outcome is relatively small, utilities can propose expenditure allowances to achieve discretionary outcomes through the IPART pricing process. However, for any discretionary expenditure to be approved through the IPART pricing process, we:

- Require robust evidence of customer willingness to pay.
- Will apply our discretionary expenditure framework (detailed below) to assess any proposal put forward by the utility.
- Require utilities to report annually on output measures to ensure that they have upheld their agreement with customers.

P.2 Why have we developed a framework for assessing discretionary expenditure?

As part of the 2020 water pricing reviews, we have developed a framework to guide how we will assess the discretionary expenditure Sydney Water and Hunter Water have included in their pricing proposals. This new framework acknowledges the growing appetite for both IPART and the water businesses to take into account liveability issues (such as environmental sustainability) when setting prices.

Although the discretionary expenditure proposed by the utilities represents only 1 to 2 % of total proposed capital expenditure over the 2020 determination period, we expect that the quantum of this type of expenditure may increase in the future. Our framework provides guidance to the utilities and establishes robust processes and checks to ensure that the impact on customers' bills arising from discretionary projects is no more than they are willing to pay for those projects.

We note that water utilities have included discretionary expenditure in their pricing proposals in the past. Previously, we assessed this expenditure within the broader capital and operating expenditure review process. This ensured that the costs were efficient and that the utility had appropriately prioritised any discretionary expenditure within its total expenditure program. We have accepted discretionary expenditure in the past where we considered that a profit-maximising business would have opted to undertake that expenditure.

P.2.1 Our discretionary expenditure framework must work for a range of different proposed projects

There is a large spectrum of potential discretionary projects with various characteristics and any discretionary expenditure framework we develop will need to apply to all possible projects.

P.3 Mandatory versus discretionary expenditure

A utility's proposal can include two categories of costs. These are the costs to:

- Comply with its **mandatory obligations**. For example, service levels under its operating licence and environmental licence obligations set by the Environmental Protection Authority (EPA).
  - We set prices to recover the efficient level of these costs that enables a monopoly service provider to deliver its service in compliance with its other regulatory obligations.
- Undertake **discretionary projects**. These are projects which are not driven or required by an external regulator or body.

Discretionary expenditure is incurred when a utility invests in projects that provide services or achieve outcomes that go beyond services standards/environmental obligations stipulated in the utility's operating licence or other regulatory instruments/requirements.

P.3.1 The discretionary expenditure component can be the cost difference between achieving the discretionary standard and the mandatory standard

Sydney Water and Hunter Water deliver their monopoly services within the bounds of their regulatory requirements. The cost of complying with these regulatory requirements is recovered from the prices that customers pay to use the service. For example, the Environmental Protection Authority (EPA) requires water utilities to comply with environmental protection licences (EPLs) while delivering wastewater services, and water utilities must also meet conditions imposed by their operating licence. An integral part of our price review process is to ensure that these costs are efficient and that the utility can raise sufficient revenue to recover these efficient costs.

However, a utility may undertake activities which result in outcomes that go beyond its regulatory requirements. For example, Sydney Water's operating licence includes a Water Continuity Standard. The standard requires that 9,800 properties per 10,000 properties do not experience an unplanned water interruption in a given year.[174] The cost to comply with this standard would be a mandatory cost that Sydney Water must incur. However, Sydney Water may obtain evidence to support that its customers prefer that no properties experience an unplanned water interruption in a given year and are willing to pay (through their water service charges) for Sydney Water to deliver this outcome.

174 Recommended Sydney Water Operating Licence 2019-2023, April 2019, p 12.

The cost to Sydney Water to ensure that the extra 2% of customers are not affected by an unplanned water interruption is discretionary because it is the cost to Sydney Water to deliver an outcome that is beyond its regulatory requirements. This cost can only be recovered through prices to customers if there is evidence that the customer base is willing to pay for this 'enhanced' service.

P.3.2 We must also consider the circumstances and context of adopting a discretionary standard

We emphasise that the example above is a simplified scenario. We acknowledge that specialised regulatory bodies set service standards, environmental obligations and drinking water quality standards (amongst other regulator obligations). These standards and obligations are set to achieve outcomes which are supported by strong evidence and cost-benefit analysis. Therefore we must also consider the circumstances and context of adopting a discretionary standard that is different to the existing mandatory standard. For example, whether the discretionary standard has been considered by Parliament and/or government when setting the existing mandatory standard and whether the facts around the issue have changed since that time.

P.4 Our discretionary framework

This section will discuss first the principles that underpin the framework we have developed to assess both Sydney Water and Hunter Water's proposed discretionary framework. We then discuss in detail each phase of the framework. Table P.1 provides a summary of the framework.

P.4.1 There are a number of principles we consider key in developing a framework

Our framework is underpinned by a number of key principles.

Efficiency

Our framework encourages both cost efficiencies and efficient levels of service provision. Robust willingness to pay survey results can identify the efficient level of service provision that maximises welfare. Additionally, we also look at efficiency in terms of the least-cost solution to meeting customer preferences.

Transparency

Transparency is an important element to ensure that the utility's activities and prices are well understood by stakeholders and its customers. Our discretionary framework endeavours to facilitate this transparency between the utility's activities and its customers.

Achieving discretionary outcomes are outside of the mandated monopoly services that utilities must supply to their customers. It is important that utilities and customers fully understand the implications of these outcomes on prices.

Additionally, the simplicity of both the framework and the utility's proposal should facilitate transparency.

Accountability

Our framework endeavours to hold utilities accountable for any proposed discretionary expenditure. This ensures that a utility's proposal matches its customers' understanding of what they are paying for and that the outcome is delivered over the specified timeframe at an efficient cost. This element of our framework is particularly important in the absence of any additional regulatory process such as obligatory service standards or environmental standards that a utility must uphold. We also need to balance the sharing of risk associated with under- or over-spending on proposed discretionary projects between the utility and the broader customer base.

Equity

Our framework recognises the benefits that utilities can gain from understanding their customers' preferences, however it emphasises the need for robust evidence of customer willingness to pay. This ensures that the customer sample consulted, appropriately reflects the population, especially vulnerable customer groups, small and large businesses and non-English speaking groups.

We outline our framework below and detail each step in the sections that follow.

Table P.1 Discretionary framework – applies to projects that provide service levels above mandated standards

Phase	Principle	Description	Existing material
Phase 1: Project definition	▼ Accountability and transparency	▼ **The project or outcome is adequately described and defined**. At a minimum, the project or outcome specification must include the following characteristics and conditions: – Location, customer/user, delivery timeframes, whether it will be replacing another service and outcomes expected. ▼ The project or outcome **fits within the utility's responsibilities and is related to its monopoly services.**	
Phase 2: Willingness to pay	▼ Transparency and equity	▼ Survey participants are given **sufficient context and information** on the proposed project or outcome. This should align with the characteristics and conditions of the project definition identified in Phase 1. ▼ The **willingness to pay dollar amounts** that customers are surveyed on **correspond to the cost of the project/outcome** estimated in Phase 3**.** ▼ The survey used to elicit customer willingness to pay is **well designed and results are statistically valid.** ▼ Bill impacts should be shown in the context of the broader bill impact.	Our 'best practice willingness to pay principles' we published in our Recycled Water review.

Phase	Principle	Description	Existing material
Phase 3: Efficiency test	▼ Accountability	▼ **The project is prioritised and optimised** within the utilities broader and required responsibilities. ▼ The project is the **most efficient cost way of achieving the outcome**. ▼ Total efficient cost estimates should transparently **net off any avoided costs and/or grants.**	Our 'efficiency test'
Phase 4: Recovery from customers	▼ Transparency and equity	▼ The proposed **prices to customers recover only the efficient cost** of the outcome or project determined in Phase 3. ▼ Bill impact per household less than WTP from Phase 2. ▼ Recovered from those whose WTP was assessed in Phase 2 (res/non res; water/wastewater/stormwater). ▼ **Separate RAB** with appropriate asset lives and long term WACC estimate so future bill impact remains within bounds of willingness to pay from Phase 2. ▼ Transparent and accountable – **separate charge on bill**, pamphlet/website explaining.	Our 'pricing principles'
Phase 5: Follow up	▼ Accountability	▼ **Capture the program as an output measure** to ensure sufficient reporting on what is achieved. ▼ Ex-post adjustment mechanism where only investments in line with project definition in willingness to pay survey added to the RAB. ▼ Requirement that the charge remains equal to or below demonstrated willingness to pay. ▼ Where outcomes are not delivered, funds collected through discretionary charge may be returned to customers in the subsequent period.	

P.4.2 Phase 1: Project definition

Our framework requires that any discretionary expenditure proposed by the utility is appropriately defined in terms of the outcomes the expenditure will achieve. The project's definition or desired outcome should be adequately scoped before a utility engages with customers on their willingness to pay.

In some cases, a discretionary project may be defined by the characteristics and conditions of the outcome that the utility wants to achieve instead of a specific project. This is because a utility may want to confirm the extent of their customers' willingness to pay for an outcome before allocating funds to scope and plan for a specific project that would achieve that outcome. For example, a utility's preliminary project definition may be to improve the appearance of its stormwater assets in a particular location instead of scoping out the activities that would be required to achieve this. At a minimum, however, these characteristics and conditions should include the outcome or project:

- location(s)
- customers that would benefit from the discretionary expenditure
- estimated timeframes for delivery, and
- if the project would be replacing an existing service.

Discretionary expenditure should be related to the utility's monopoly services

The project or outcome that the discretionary expenditure will achieve should be related to the utility's mandatory monopoly services and fit within the utility's responsibilities. For example, the utility should confirm in its proposal:

- That the utility is the most suitable agency to deliver the proposed outcome or project
- That the proposal best fits within the utility's responsibilities instead of another party or party's responsibilities, such as another arm of government or local government, and
- That the proposal is consistent with the *Independent Pricing and Regulatory Tribunal Act 1992* and any other relevant legislation.

The utility's customers should inform the type of discretionary project/outcome proposed by the utility

The identification of any proposed discretionary project or outcome should be customer driven and as part of its proposal, a utility should show evidence of how it consulted its customers to identify any proposed discretionary projects.

As a first step, utilities should understand its customers' priorities and preferences and this should inform not only its proposal for discretionary expenditure but in general, its overall decision-making process.

Project identification and selection

Ideally the identification of potential projects should be customer driven rather than proposed by the utility and/or its staff, or stakeholders with a vested interest in particular outcomes. The utility could offer a menu of options to customers and ask customers to rank the projects or indicate which projects of those offered they would prefer.

P.4.3 Phase 2: Are customers willing to pay?

Utilities should regularly engage with customers, so as to understand their preferences. The outcomes of this process should then inform which discretionary outcomes a utility includes in its pricing proposal. Additionally, it is essential that utilities show robust evidence of customers' willingness to pay for the proposed discretionary outcome. It is important to highlight that the extent of the willingness to pay surveys conducted by the utility should be proportionate to the relative quantum of the discretionary expenditure proposed compared to its overall expenditure proposal. This section outlines some elements of a robust customer willingness to pay survey. Box P.1 provides our best practice principles for demonstrating willingness to pay.

Survey participants should be given sufficient context and information on the proposed outcome or project

The utility should ensure that when consulting customers on their willingness to pay for proposed discretionary expenditure, there is sufficient context and supporting information provided in a clear manner to allow respondents to make informed decisions. In particular, the characteristics and conditions of the project or outcome presented in willingness to pay

questions must align with the characteristics and conditions of the proposed project or outcome in the utility's pricing proposal.

Survey participants should be consulted on the same outcomes that the utility previously defined and scoped. This includes the characteristics and conditions outlined in Phase 1. The discretionary outcomes or projects should be expressed in terms of benefits that customers directly value.

The dollar amounts presented in the survey should correspond with the actual estimated cost of the project or outcomes

When surveying customers on their willingness to pay, the choices presented must be in dollar amounts and require discrete voting. The dollar values that respondents are asked to vote on should correspond with the actual estimated cost of the project or outcomes and should be expressed in terms of the ongoing bill impact for the customer, not the total project cost.

Utilities should use a long-term view of the funding costs when estimating the cost of the project/outcome and presenting it to customers on a bill impact basis. This is to avoid a situation where a future change to the interest rate (or weighted average cost of capital (WACC)) results in future project costs being greater than those proposed in the original survey of customers' willingness to pay.

The bill impact of the project should be presented in the context of the respondents' total bill, including any other planned bill increases/decreases occurring as a result of price changes external to the discretionary expenditure. Customers should be made aware of their budget constraint, and that choices could potentially subtract from the amount they can spend on other outcomes.

The surveys used to elicit customers' willingness to pay should be well designed and produce statistically significant results

Estimates of willingness to pay can only be accurately drawn from a robust survey that produces valid responses. Key features of a well-designed survey include: a sample size that is both sufficiently large and is representative of all demographics of the broader customer population; participants being randomly sourced and screened to ensure all quotas for customer groups are represented; and no participants having a personal interest in the utility or related organisations.

The survey should be carried out in an appropriate format that may include multiple platforms such as online surveys, face-to-face forums and discussion groups. The survey should aim for reliability through repetition. Utilities should ensure that sensitivity to the survey instrument is tested, including whether the structure, wording and order of questions influences responses (eg, respondents 'anchoring' answers to values seen earlier in the survey).

Results of the survey should be analysed, ensuring they are statistically significant. A survey can be deemed invalid if there are high non-response rates to certain questions or to the overall survey, and if there is evidence of obvious bias in the survey design or conduct.

Box P.1 Best practice principles for demonstrating willingness-to-pay using a contingent valuation approach to stated preference surveys

- Participants are given the impression that their answers are consequential and that they may be compelled to pay any amount they commit to in the survey. The payment mechanism by which people would financially contribute is specific and credible (eg, annual change in water or wastewater bills).
- The non-market outcomes (external benefits) in the survey are expressed in terms of outcomes that people directly value (eg, people should be asked about willingness-to-pay for the environmental improvements brought about by increases in water recycling, rather than for increases in water recycling in and of itself).
- There is alignment between the external benefits being valued and the likely investment outcomes. The survey should not reflect an overly optimistic view about what benefits the scheme would achieve, and major uncertainties should be made clear to participants.
- The information provided to participants is clear, relevant, easy to understand and objective. For example, this can be tested through focus groups and pilot surveys, consulting stakeholders, and including appropriate maps and diagrams.
- Participants are encouraged to consider the context of their decisions, including the broader context of expected or proposed changes in prices for other services, as well as alternative approaches to achieving the external benefits.
- The valuation questions require participants to make discrete choices (such as 'yes/no' or selecting options), and include a 'no-answer' option to identify participants that are indifferent.
- Follow-up questions are used to detect potential sources of bias, such as cases where participants did not understand the valuation question(s) or the information provided.
- The sample of people surveyed is representative of the broader customer base and large enough to permit robust data analysis. The study should clearly set out how customers were selected for the survey, the number of participants and the response rate.
- Estimates of average willingness-to-pay are supplemented with confidence intervals to indicate the precision of the estimates.
- Population-wide estimates of willingness-to-pay for external benefits are calculated in a transparent and appropriate way. Potential reasons for non-response to the survey should be identified. Sensitivity analysis should be used to demonstrate how aggregate estimates change depending on assumptions about the values held by non-respondents and the extent of the population affected by the investment.
- Survey questions are designed and analysed using appropriate statistical techniques. For example, payment levels need to cover the likely range of amounts that customers might be willing to pay, no option should clearly dominate the others, and participants should not be burdened with too many choices.

Source: Based on Productivity Commission, Environmental Policy Analysis: A Guide to Non-Market Valuation, January 2014, pp 44-47

P.4.4 Phase 3: Are the costs efficient?

We set prices to allow a utility to recover the efficient cost of delivering its monopoly services. This principle applies to any discretionary expenditure that the utility proposes. We would assess whether the proposed discretionary expenditure is the most efficient means of achieving the outcome or delivering the 'enhanced' service that the customers are willing to

pay for. To do this, we apply our existing efficiency test. This way the priority of the discretionary outcome is assessed along with the mandatory outcomes that the utility is required to achieve. Our efficiency test is described in Appendix B.

A utility may propose multiple projects to achieve a discretionary outcome

We will assess the efficient costs of delivering a service or achieving an outcome. This could mean that there are multiple projects a utility may undertake to achieve a single outcome. In the case that a utility proposes multiple projects to meet a discretionary outcome, the portfolio of projects together should be the most efficient or optimum mix of projects to meet the outcome.

The efficiency test also applies to historical discretionary expenditure

As part of our efficiency test we also review historical capital expenditure incurred in the previous determination period. This assesses whether the actual expenditure was efficient based on the information available to the utility at the time it incurred the expenditure. This principle applies to discretionary expenditure, and we will do a post-expenditure assessment to ensure that the actual or historical discretionary expenditure was within the bounds of what customers were willing to pay, and the project characteristics and conditions of the project as it was delivered matched those described to willingness to pay survey participants.

The utility should calculate the efficient net discretionary expenditure

Willingness to pay surveys should quantify the benefits that customers would receive from discretionary expenditure. We recognise that there may be third parties who could also benefit from the proposed project or outcome. This provides an opportunity for the utility to access funding from these third parties, or Government, to fund or partially fund discretionary projects.

Should a utility receive any third party funding for a project, our standard approach is to subtract this amount from the utility's total efficient costs, to ensure that it does not over-recover for a project.

Avoided costs should be deducted

Similarly, any avoided costs should be deducted from the total cost, and the willingness to pay survey conducted on the value of external benefits provided to the broader customer base. This is because our recycled water framework already allows any avoided costs net of revenue forgone to be recovered from the broader customer base.

P.4.5 Phase 4: Recovery from customers and delivery incentives

Phase 4 of our framework considers how the discretionary expenditure we allow should be recovered from customers, and how to hold the utility accountable for delivery of the outcomes in a way that meets customer expectations.

How much to recover?

The maximum total cost to be recovered for a specific project is the efficient expenditure identified in Phase 3. When translated to prices, it must also be less per household per year than the maximum demonstrated willingness to pay from Phase 2.

We propose creating a separate RAB for discretionary expenditure to calculate the most accurate charge. This will ensure appropriate asset lives are used that match the nature of the proposed projects.

Who should we recover the expenditure from?

At the extreme, there is scope for discretionary expenditure to be recovered from the business's entire broader customer base. However we consider there should be alignment between the sample of customers whose willingness to pay has been assessed and those customers among whom the costs are shared. This may limit the recovery of discretionary expenditure costs to, for example, residential customers only, if the willingness to pay of non-residential customers has not been assessed in Phase 2. We note there may be a higher degree of difficulty in engaging non-residential customers in willingness to pay surveys.

Discretionary expenditure should be transparent to customers

We consider that as the estimated willingness to pay amount is per customer, rather than per service, it may be more straightforward to recover the costs of discretionary expenditure through a separate, single charge on each bill. This would allow a clear comparison between the amount each customer is being asked to pay, and the demonstrated willingness to pay derived from the customer survey. It would allow water utilities to bill only those customer groups with demonstrated willingness to pay, and it would also aid transparency of discretionary expenditure over time.

A separate charge allows flexibility in recovery of discretionary expenditure

A separate charge on bills that incorporates discretionary expenditure allows utilities to target their willingness to pay surveys to customer segments relevant to a particular proposed project. For example, customers in particular locations; residential or non-residential customers; or customers of specific services.

A separate charge maximises accountability to customers

A separate charge allows utilities to easily provide context when conducting willingness to pay surveys for future discretionary expenditure. Customers will be able to make decisions on how much they are willing to pay for a project with full knowledge of how much discretionary expenditure they are currently paying for, rather than it being hidden within monopoly service charges.

Ensuring utilities are accountable for the delivery of the project

We need to hold utilities accountable for any proposed discretionary expenditure. This ensures that the utility's proposal matches the customers' understanding of what they are paying for and that the outcome is delivered over the specified timeframe at an efficient cost.

This element is particularly important given the absence of any additional regulatory process such as obligatory service standards or environmental standards that a utility must uphold in relation to this type of expenditure.

To ensure accountability to customers, we have included performance commitments to ensure delivery of discretionary projects and alignment with customer expectations.

Sharing of risk between customers and the utility

For discretionary expenditure we are aiming to provide incentives that ensure that utilities are accountable to customers and appropriately gauge project risks prior to making commitments to customers.

When considering the incentives to ensure project delivery, the utility should face clear financial consequences if it cannot meet its stated outcomes on which it has gained community support. We realise that this assessment may not be purely objective, however, many of the projects that would be classed as discretionary would be discrete in nature and amenable to having a clear set of outcomes defined.

The clear incentive for focus on delivery will be achieved through:

- our standard approach to ex-post adjustments to capital expenditure during the next review, and
- a next period adjustment to assess whether any underspend is returned to customers, used to provide similar outcomes or retained by the utility as an efficiency gain. This is a slightly different approach to our standard approach as we are focussed on discrete discretionary proposals which may not be 'part' of a much wider expenditure profile.

In some cases, an underspend may be used to increase the level of a particular outcome as some projects have a 'budget envelope', and an improved level of outcome may be an appropriate strategy rather than refunding customers.

This approach will achieve outcomes based regulation for program expenditure which is closely aligned with customer preferences.

P.4.6 Phase 5: Follow up

Capture the program of discretionary expenditure in output measures

We propose that the outcomes associated with the discretionary expenditure, particularly those that were key to the phrasing of the willingness to pay survey, be included in the utility's output measures. This will ensure sufficient reporting on what is being achieved as a result of discretionary expenditure, and allow comparison with the project definition used as part of the willingness to pay survey. Output measures could include, for example, kilometres of stormwater channel naturalised.

Ex-post adjustment mechanism

We consider that it is essential that any discretionary project aligns with the characteristics and conditions presented as part of the willingness to pay survey. We propose an ex-post adjustment mechanism that considers whether the specific projects undertaken align with the project definition presented to customers as part of the willingness to pay survey. This mechanism should also consider whether the project is still discretionary, or if for example due to changes in licence conditions or mandatory standards it is now part of the utility's monopoly service obligations.

Part of this ex-post adjustment will include a standard review of discretionary expenditure to assess that utilities have not exceeded their initial project cost estimates. This will also ensure that utilities cannot exceed the willingness to pay price cap indicated by customers.

A next period adjustment will ensure any underspend is returned to customers, and any overspend is not recovered from customers.

What happens if expenditure is no longer discretionary?

In some instances, it may be possible that expenditure that is discretionary when proposed by the utility becomes part of meeting its monopoly service obligations. This could occur when licence conditions or mandatory environmental standards are changed such that expenditure initially proposed to exceed standards, is now expenditure to meet the new (higher) standards.

When this occurs, the expenditure becomes part of the cost base required to meet the utility's monopoly service obligations. The project would be transferred from the Discretionary Regulatory Asset Base to be folded back into the Monopoly Regulatory Asset Base, which would remove the cost of the project from the separate discretionary charge and add it to the relevant monopoly service charge.

Q Assessment of Sydney Water's proposed discretionary expenditure and prices

We have applied the discretionary expenditure framework to each of the proposed projects

We have applied the framework to each proposed project, using the information provided to us by Sydney Water in its proposal and subsequently.

Diverting untreated wastewater from Vaucluse-Diamond Bay

Our application of the framework to this project is summarised in Table Q.1.

Table Q.1 Vaucluse-Diamond Bay project assessment against discretionary framework

Phase	Description	Assessment / Approach
Phase 1: Project definition	Project location is specified as Vaucluse-Diamond Bay (VDB) in Sydney Water's Price Proposal to IPART. Customers/users are identified as around 2000 people who visit the affected area annually (for fishing and swimming). Delivery timeframes are not specified, however Sydney Water proposes $63.5m in capital expenditure over 2020-24 to build assets to divert wastewater to the Bondi treatment plant. The project is not replacing an existing service. Outcomes are outlined as stopping untreated wastewater outfalls during dry weather, but no specific output measures.	The project fits within the utility's responsibility, but there is no regulatory requirement to undertake the project (ie, without the project, monopoly services could still be delivered while complying with environmental regulatory requirements). The project is discretionary. It is well defined and the outcomes are clearly communicated through Sydney Water's proposal. However, the project could be better supported by the inclusion of specific and tangible output measures to be achieved.
Phase 2: Willingness to pay	The location of the project was not outlined specifically in the survey, but simply disclosed as "three locations in Sydney". A Willingness to Pay (WTP) dollar amounts are elicited through a Contingent Valuation Method (CVM) approach. In a subsequent survey, respondents were presented with a single $2.30/year price to vote on, which does not correlate with WTP. The $2.30 price is based on project cost estimates available at the time. Bill impacts were shown in the context of broader bill impacts.	Overall, Sydney Water has conducted a thorough and comprehensive customer engagement program, which consults on whether customers would pay to divert untreated wastewater ocean outfalls from Vaucluse-Diamond Bay to the Bondi treatment plant. The WTP study has been mostly carried out using best practice principles. However: ▼ The outcome of this project in reducing public health risks and environmental degradation is not stated. ▼ The location of this project is not stated, despite it being normal practice to provide this information to survey respondents.

Phase	Description	Assessment / Approach
Phase 3: Efficiency test	Sydney Water proposed investing $63.5 million over 2020-24 to deliver the VDB upgrade. Supporting documentation provided: ▼ VDB Economic Assessment of options (including CBA) conducted by Aither, provided by Sydney Water. ▼ VDB option approval business case provided by Sydney Water. Atkins assessment of efficient expenditure: $62.2 million over 2020-24.	Our expenditure consultants, Atkins, have assessed the program as efficient and consider it prudent to be undertaken in the next period. Sydney Water has also provided sufficient documentation (business case, cost-benefit analysis and options analysis) to demonstrate that the project has been developed using appropriate processes.
Phase 4: Recovery and delivery incentives	The $2.30/year price was based on project cost estimates available at the time of the WTP survey.	IPART draft prices are less than this and are included in a separate discretionary RAB. There is a separate charge in the 2020 Determination, but this charge is incorporated into wastewater service charge on bills.
Phase 5: Implementation & performance commitments		We do not assess implementation and performance commitments at this stage. These will be completed in the next determination period.

Waterway Health Improvement Program (WHIP)

Our application of the framework to this project is summarise in Table Q.2.

Table Q.2 Waterway Health Improvement Program assessment against discretionary framework

Phase	Description	Assessment / Approach
Phase 1: Project definition	The location is defined as creeks and rivers in the catchments of the Georges, Cooks and Parramatta Rivers. Customers/users are not specifically defined. Beneficiaries could be visitors to waterways, but only stormwater customers are charged. Delivery timeframes are stated as 2020-25 period. Outcomes are clearly defined. Sydney Water states that the program is a continuation of a waterway health program started in 2016, but it is unclear whether the WHIP is replacing the existing service or is a continuation of the same service.	It is somewhat unclear whether the project is discretionary, since Sydney Water states the project is to achieve mandatory standards in its Operating Licence. Our view is that this project is discretionary, as we consider Sydney Water is currently not obliged to deliver the WHIP to meet its monopoly service obligations. Our view is that customers are willing-to-pay for improved waterways health outcomes, and Sydney Water's future licence obligations could be refined to include this expenditure. The project was defined clearly in terms of location, timeframes, and outcomes, with tangible output measures specified.

Phase	Description	Assessment / Approach
Phase 2: Willingness to pay	The survey gives sufficient contextual information and describes tangible outcomes to respondents. The first economic WTP study determines the maximum WTP, but this amount does not correspond with the second market research study. The price provided in the context of bill impacts is assumed to correspond with the estimated cost of the project at the time of the survey, although Sydney Water states that total cost is likely to be less than $2.90/year. In the second study, the project was only presented to respondents in the postcodes comprising a large majority of Sydney Water stormwater customers, since these customers will be paying for the program.	Customer WTP was sought through a two-step consultation process, where the first stage included a study conducted by Gillespie Economics. This first stage was carried out using best practice principles for calculating WTP. However, the second stage only asked respondents whether they would vote to either implement the program for a specified price or not. This does not reveal average WTP but only the proportion of customers that are willing to pay this amount for the project.
Phase 3: Efficiency test	Total capital expenditure forecast is $16.1 million. Sydney Water states that the project is "an integral part of the monopoly service. The program is "well-supported" by customers and has been prioritised within broader responsibilities. Appropriate processes undertaken to plan and develop this project, with sufficient documentation provided: ▼ Waterway Health Draft Capital Program Business Case submitted to IPART 22 July 2019 by Sydney Water. ▼ WHIP Decision Framework document (including CBA) submitted to IPART by Sydney Water. Atkins efficient expenditure assessment: $15.9 million over 2020-24.	The WHIP was developed using appropriate processes, with a supporting business case. Our expenditure consultants, Atkins, have assessed the program as efficient and consider it prudent to be undertaken in the next period.
Phase 4: Recovery and delivery incentives	Customers voted to implement the program at $2.90 per year ongoing.	IPART's draft prices are less than this and are included in a separate discretionary RAB. Although there is a separate charge in the 2020 Determination, this charge will be incorporated into the stormwater service charge on customer bills.
Phase 5: Implementation & performance commitments		We do not assess implementation and performance commitments at this stage. These will be completed in the next determination period.

ISBN 978-1-76049-399-8

The Independent Pricing and Regulatory Tribunal (IPART)

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Tribunal Members

The Tribunal members for this review are:

Dr Paul Paterson, Chair

Ms Deborah Cope

Ms Sandra Gamble

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Invitation for submissions

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

Submissions are due by 27 April 2020

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

You can also send comments by mail to:

Sydney Water Price Review
Independent Pricing and Regulatory Tribunal
PO Box K35
Haymarket Post Shop, Sydney NSW 1240

Late submissions may not be accepted at the discretion of the Tribunal. Our normal practice is to make submissions publicly available on our website <www.ipart.nsw.gov.au> as soon as possible after the closing date for submissions. If you wish to view copies of submissions but do not have access to the website, you can make alternative arrangements by telephoning one of the staff members listed above.

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